

중학 연산의 빅데이터

빅터 7 연산

정답과 해설

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제곱근과 실수

STEP 1

01 제곱근

p. 6 ~ p. 7

1-1	-5, -5	1-2	3, -3	1-3	1, -1
2-1	7, -7	2-2	0	2-3	4, -4
3-1	$\frac{1}{2}, -\frac{1}{2}$	3-2	$\frac{1}{5}, -\frac{1}{5}$	3-3	$\frac{2}{3}, -\frac{2}{3}$
4-1	0.1, -0.1	4-2	0.2, -0.2	4-3	0.7, -0.7
5-1	-8, -8	5-2	9, -9	5-3	12, -12
6-1	$\frac{1}{10}, -\frac{1}{10}$	6-2	$\frac{4}{5}, -\frac{4}{5}$	6-3	0.6, -0.6
7-1	6, -6	7-2	8, -8	7-3	$\frac{1}{3}, -\frac{1}{3}$
8-1	0	8-2	11, -11	8-3	13, -13
9-1	4, -4	9-2	$\frac{3}{4}, -\frac{3}{4}$	9-3	0.8, -0.8

02 제곱근 나타내기 (1)

p. 8

1-1	$-\sqrt{3}$	1-2	$\pm\sqrt{7}$	1-3	$\pm\sqrt{10}$
2-1	$\pm\sqrt{13}$	2-2	$\pm\sqrt{15}$	2-3	$\pm\sqrt{21}$
3-1	$\sqrt{\frac{2}{3}}$	3-2	$\pm\sqrt{\frac{1}{2}}$	3-3	$\pm\sqrt{\frac{5}{7}}$
4-1	$-\sqrt{0.5}$	4-2	$\pm\sqrt{1.1}$	4-3	$\pm\sqrt{0.65}$

03 제곱근 나타내기 (2)

p. 9 ~ p. 10

1-1	4, 2	1-2	4
2-1	$\frac{1}{4}$	2-2	$\frac{5}{3}$
3-1	9, -3	3-2	-5
4-1	$-\frac{1}{10}$	4-2	-0.3
5-1	49, ± 7	5-2	± 11
6-1	$\pm\frac{8}{9}$	6-2	± 0.6
7-1	$\sqrt{3}$	7-2	$\pm\sqrt{5}$
8-1	± 3	8-2	$\pm\sqrt{10}$
9-1	$\pm\sqrt{11}$	9-2	$\pm\sqrt{14}$
10-1	$\pm\sqrt{\frac{2}{7}}$	10-2	$\pm\frac{2}{3}$
11-1	$\pm\sqrt{\frac{5}{13}}$	11-2	$\pm\sqrt{0.6}$

$$1-2 \quad \sqrt{16} = (16 \text{의 양의 제곱근}) = 4$$

$$2-1 \quad \sqrt{\frac{1}{16}} = \left(\frac{1}{16} \text{의 양의 제곱근}\right) = \frac{1}{4}$$

$$2-2 \quad \sqrt{\frac{25}{9}} = \left(\frac{25}{9} \text{의 양의 제곱근}\right) = \frac{5}{3}$$

$$3-2 \quad -\sqrt{25} = (25 \text{의 음의 제곱근}) = -5$$

$$4-1 \quad -\sqrt{\frac{1}{100}} = \left(\frac{1}{100} \text{의 음의 제곱근}\right) = -\frac{1}{10}$$

$$4-2 \quad -\sqrt{0.09} = (0.09 \text{의 음의 제곱근}) = -0.3$$

$$5-2 \quad \pm\sqrt{121} = (121 \text{의 제곱근}) = \pm 11$$

$$6-1 \quad \pm\sqrt{\frac{64}{81}} = \left(\frac{64}{81} \text{의 제곱근}\right) = \pm\frac{8}{9}$$

$$6-2 \quad \pm\sqrt{0.36} = (0.36 \text{의 제곱근}) = \pm 0.6$$

$$7-2 \quad \sqrt{25} = 5 \text{이므로 } 5 \text{의 제곱근은 } \pm\sqrt{5}$$

$$8-1 \quad \sqrt{81} = 9 \text{이므로 } 9 \text{의 제곱근은 } \pm 3$$

$$8-2 \quad \sqrt{100} = 10 \text{이므로 } 10 \text{의 제곱근은 } \pm\sqrt{10}$$

$$9-1 \quad \sqrt{121} = 11 \text{이므로 } 11 \text{의 제곱근은 } \pm\sqrt{11}$$

$$9-2 \quad \sqrt{196} = 14 \text{이므로 } 14 \text{의 제곱근은 } \pm\sqrt{14}$$

$$10-1 \quad \sqrt{\frac{4}{49}} = \frac{2}{7} \text{이므로 } \frac{2}{7} \text{의 제곱근은 } \pm\sqrt{\frac{2}{7}}$$

$$10-2 \quad \sqrt{\frac{16}{81}} = \frac{4}{9} \text{이므로 } \frac{4}{9} \text{의 제곱근은 } \pm\frac{2}{3}$$

$$11-1 \quad \sqrt{\frac{25}{169}} = \frac{5}{13} \text{이므로 } \frac{5}{13} \text{의 제곱근은 } \pm\sqrt{\frac{5}{13}}$$

$$11-2 \quad \sqrt{0.36} = 0.6 \text{이므로 } 0.6 \text{의 제곱근은 } \pm\sqrt{0.6}$$

04 a 의 제곱근과 제곱근 a

p. 11

1-1	양, $\sqrt{3}$	1-2	$\pm\sqrt{7}, \sqrt{7}$
2-1	$\pm\sqrt{13}, \sqrt{13}$	2-2	$\pm\sqrt{21}, \sqrt{21}$
3-1	3	3-2	$\pm 4, 4$
4-1	$\pm 10, 10$	4-2	$\pm 12, 12$

STEP 2

기본연산 집중연습 | 01~04

p. 12 ~ p. 13

1-1 $\pm\sqrt{6}$	1-2 $\sqrt{6}$
1-3 $\sqrt{6}$	1-4 $\sqrt{10}$
1-5 $\pm\sqrt{15}$	1-6 $\pm\sqrt{11}$
1-7 $-\sqrt{11}$	1-8 ± 1
1-9 -4	1-10 7
1-11 5	1-12 $-\frac{1}{8}$
1-13 ± 3	1-14 $-\sqrt{11}$
1-15 $-\sqrt{1.2}$	1-16 $\pm\sqrt{\frac{5}{13}}$
2-1 \times	2-2 \bigcirc
2-3 \bigcirc	2-4 \times
2-5 \times	2-6 \bigcirc
2-7 \times	2-8 \times
2-9 \bigcirc	2-10 \times

십별지목

1-11 $(-5)^2=25$ 이므로 25의 양의 제곱근은 5

1-12 $\left(-\frac{1}{8}\right)^2=\frac{1}{64}$ 이므로 $\frac{1}{64}$ 의 음의 제곱근은 $-\frac{1}{8}$

1-13 $\sqrt{81}=9$ 이므로 9의 제곱근은 ± 3

1-14 $\sqrt{121}=11$ 이므로 11의 음의 제곱근은 $-\sqrt{11}$

1-15 $\sqrt{1.44}=1.2$ 이므로 1.2의 음의 제곱근은 $-\sqrt{1.2}$

1-16 $\sqrt{\frac{25}{169}}=\frac{5}{13}$ 이므로 $\frac{5}{13}$ 의 제곱근은 $\pm\sqrt{\frac{5}{13}}$

2-1 제곱근 8은 $\sqrt{8}$ 이다.

2-4 $\sqrt{16}=4$ 이므로 4의 제곱근은 ± 2 이다.

2-5 12의 제곱근은 $\pm\sqrt{12}$ 이다.

2-7 -3 은 9의 음의 제곱근이고
3의 음의 제곱근은 $-\sqrt{3}$ 이다.

2-8 5의 제곱근은 $\pm\sqrt{5}$ 이다.

2-10 양수 a 의 제곱근은 \sqrt{a} , $-\sqrt{a}$ 로 2개이고
0의 제곱근은 1개이다.
또 음수의 제곱근은 생각하지 않는다.

STEP 1

05 제곱근의 성질 (1)

p. 14 ~ p. 15

1-1 2, 2	1-2 7	1-3 9
2-1 $\frac{1}{2}$	2-2 $\frac{2}{3}$	2-3 0.1
3-1 2, 2	3-2 5	3-3 10
4-1 $\frac{1}{3}$	4-2 $\frac{3}{5}$	4-3 0.3
5-1 3, -3	5-2 -7	5-3 -9
6-1 -17	6-2 $-\frac{1}{2}$	6-3 -1.5
7-1 3, -3	7-2 -5	7-3 -10
8-1 -12	8-2 $-\frac{5}{6}$	8-3 -1.3

06 제곱근의 성질 (2)

p. 16 ~ p. 17

1-1 양, 2	1-2 4	1-3 6
2-1 $\frac{1}{2}$	2-2 $\frac{3}{2}$	2-3 0.2
3-1 4, 2	3-2 7	3-3 15
4-1 $\frac{1}{4}$	4-2 $\frac{2}{5}$	4-3 0.8
5-1 -2	5-2 -5	5-3 -11
6-1 -2	6-2 -8	6-3 -14
7-1 $-\frac{3}{2}$	7-2 -0.4	7-3 $-\frac{3}{11}$
8-1 4, 4	8-2 6	8-3 -9
9-1 $\frac{2}{7}$	9-2 $-\frac{10}{3}$	9-3 -0.8

8-2 $\sqrt{36}=\sqrt{6^2}=6$

8-3 $-\sqrt{81}=-\sqrt{9^2}=-9$

9-1 $\sqrt{\frac{4}{49}}=\sqrt{\left(\frac{2}{7}\right)^2}=\frac{2}{7}$

9-2 $-\sqrt{\frac{100}{9}}=-\sqrt{\left(\frac{10}{3}\right)^2}=-\frac{10}{3}$

9-3 $-\sqrt{0.64}=-\sqrt{0.8^2}=-0.8$

07 제곱근의 성질을 이용한 덧셈, 뺄셈

p. 18

1-1	3, 9	1-2	10
2-1	8	2-2	10
3-1	10, -3	3-2	-3
4-1	5	4-2	2
5-1	12	5-2	3

1-2 $(-\sqrt{8})^2 + (-\sqrt{2})^2 = 8 + 2 = 10$

2-1 $(-\sqrt{2})^2 + \sqrt{6^2} = 2 + 6 = 8$

2-2 $\sqrt{5^2} + \sqrt{(-5)^2} = 5 + 5 = 10$

3-2 $\sqrt{5^2} - \sqrt{(-8)^2} = 5 - 8 = -3$

4-1 $(-\sqrt{8})^2 - \sqrt{3^2} = 8 - 3 = 5$

4-2 $-\sqrt{(-3)^2} + (-\sqrt{5})^2 = -3 + 5 = 2$

5-1 $\sqrt{100} + \sqrt{(-2)^2} = \sqrt{10^2} + \sqrt{(-2)^2} = 10 + 2 = 12$

5-2 $(\sqrt{9})^2 - \sqrt{36} = (\sqrt{9})^2 - \sqrt{6^2} = 9 - 6 = 3$

08 제곱근의 성질을 이용한 곱셈, 나눗셈

p. 19

1-1	$\frac{3}{4}, 6$	1-2	2
2-1	18	2-2	20
3-1	15	3-2	-3
4-1	6, 2	4-2	3
5-1	$\frac{1}{6}$	5-2	4

1-2 $(-\sqrt{14})^2 \times \left(\sqrt{\frac{1}{7}}\right)^2 = 14 \times \frac{1}{7} = 2$

2-1 $(-\sqrt{6})^2 \times \sqrt{(-3)^2} = 6 \times 3 = 18$

2-2 $\sqrt{4^2} \times \sqrt{(-5)^2} = 4 \times 5 = 20$

3-1 $\sqrt{9} \times \sqrt{5^2} = \sqrt{3^2} \times \sqrt{5^2} = 3 \times 5 = 15$

3-2 $-(\sqrt{0.3})^2 \times \sqrt{10^2} = -0.3 \times 10 = -3$

4-2 $\sqrt{9^2} \div (-\sqrt{3})^2 = 9 \div 3 = 3$

5-1 $\sqrt{\left(-\frac{1}{5}\right)^2} \div \left(-\sqrt{\frac{6}{5}}\right)^2 = \frac{1}{5} \div \frac{6}{5} = \frac{1}{5} \times \frac{5}{6} = \frac{1}{6}$

5-2 $(-\sqrt{6})^2 \div \sqrt{\left(\frac{3}{2}\right)^2} = 6 \div \frac{3}{2} = 6 \times \frac{2}{3} = 4$

09 제곱근의 성질을 이용한 사칙 계산

p. 20 ~ p. 21

1-1	3, 7, -2	1-2	-4
2-1	-1	2-2	12
3-1	6	3-2	0
4-1	-11	4-2	6
5-1	5, 30, 10	5-2	2
6-1	1	6-2	-1
7-1	5	7-2	-5
8-1	4	8-2	-9
9-1	4	9-2	-1

1-2 $-\sqrt{(-3)^2} + \sqrt{5^2} - (-\sqrt{6})^2 = -3 + 5 - 6 = -4$

2-1 $(-\sqrt{2})^2 - \sqrt{49} + \sqrt{(-4)^2} = 2 - 7 + 4 = -1$

2-2 $\sqrt{(-3)^2} + (-\sqrt{5})^2 + \sqrt{16} = 3 + 5 + 4 = 12$

3-1 $(-\sqrt{5})^2 - \sqrt{(-3)^2} + \sqrt{7^2} - (-\sqrt{3})^2 = 5 - 3 + 7 - 3 = 6$

3-2 $\sqrt{(-11)^2} - (-\sqrt{12})^2 - (-\sqrt{13})^2 + \sqrt{(-14)^2}$
 $= 11 - 12 - 13 + 14 = 0$

4-1 $-\sqrt{9} + (-\sqrt{6})^2 - \sqrt{(-4)^2} - \sqrt{100}$
 $= -3 + 6 - 4 - 10 = -11$

4-2 $\sqrt{7^2} - (-\sqrt{2})^2 - \sqrt{(-11)^2} + \sqrt{144}$
 $= 7 - 2 - 11 + 12 = 6$

5-2 $\sqrt{(-8)^2} \times \sqrt{4^2} \div (-\sqrt{16})^2 = 8 \times 4 \div 16$
 $= 32 \div 16 = 2$

6-1 $\sqrt{(-12)^2} \div (-\sqrt{6})^2 \times \sqrt{\left(-\frac{1}{2}\right)^2} = 12 \div 6 \times \frac{1}{2}$
 $= 2 \times \frac{1}{2} = 1$

6-2 $-\sqrt{10^2} \div \sqrt{4} \times \left(-\sqrt{\frac{1}{5}}\right)^2 = -10 \div 2 \times \frac{1}{5}$
 $= -5 \times \frac{1}{5} = -1$

7-1 $(\sqrt{8})^2 - (-\sqrt{15})^2 \div \sqrt{5^2} = 8 - 15 \div 5$
 $= 8 - 3 = 5$

7-2 $(-\sqrt{7})^2 - \sqrt{16} \times (-\sqrt{3})^2 = 7 - 4 \times 3$
 $= 7 - 12 = -5$

8-1 $(-\sqrt{5})^2 + (-\sqrt{6})^2 \times \sqrt{\left(\frac{1}{3}\right)^2} - (\sqrt{3})^2$
 $= 5 + 6 \times \frac{1}{3} - 3$
 $= 5 + 2 - 3 = 4$

$$\begin{aligned}
 \text{8-2 } & \sqrt{(-5)^2} - (\sqrt{11})^2 + \sqrt{81} \div (-\sqrt{3^2}) \\
 & = 5 - 11 + 9 \div (-3) \\
 & = 5 - 11 - 3 = -9
 \end{aligned}$$

$$\begin{aligned}
 \text{9-1 } & \sqrt{64} \div (-\sqrt{8})^2 + \left(-\sqrt{\frac{1}{2}}\right)^2 \times \sqrt{(-6)^2} \\
 & = 8 \div 8 + \frac{1}{2} \times 6 \\
 & = 1 + 3 = 4
 \end{aligned}$$

$$\begin{aligned}
 \text{9-2 } & \sqrt{12^2} \div (\sqrt{4})^2 - \sqrt{\left(-\frac{4}{5}\right)^2} \times \sqrt{25} \\
 & = 12 \div 4 - \frac{4}{5} \times 5 \\
 & = 3 - 4 = -1
 \end{aligned}$$

$$\text{2-4 } \sqrt{(-1.2)^2} - \sqrt{(-0.2)^2} = 1.2 - 0.2 = 1$$

$$\text{2-5 } \sqrt{25} - \sqrt{7^2} + (-\sqrt{6})^2 = 5 - 7 + 6 = 4$$

$$\text{2-6 } \sqrt{(-14)^2} - \sqrt{12^2} + \sqrt{16} = 14 - 12 + 4 = 6$$

$$\begin{aligned}
 \text{2-7 } & (-\sqrt{6})^2 \times \left(\sqrt{\frac{1}{3}}\right)^2 - \sqrt{(-1)^2} = 6 \times \frac{1}{3} - 1 \\
 & = 2 - 1 = 1
 \end{aligned}$$

$$\begin{aligned}
 \text{2-8 } & -\sqrt{(-11)^2} + (-\sqrt{8})^2 \times \left(\sqrt{\frac{1}{2}}\right)^2 = -11 + 8 \times \frac{1}{2} \\
 & = -11 + 4 \\
 & = -7
 \end{aligned}$$

$$\begin{aligned}
 \text{2-9 } & (-\sqrt{10})^2 \div \sqrt{(-2)^2} \times \left(\sqrt{\frac{1}{5}}\right)^2 = 10 \div 2 \times \frac{1}{5} \\
 & = 5 \times \frac{1}{5} = 1
 \end{aligned}$$

$$\begin{aligned}
 \text{2-10 } & -\left(\sqrt{\frac{2}{3}}\right)^2 \div \sqrt{\left(-\frac{1}{6}\right)^2} \div (-\sqrt{2})^2 = -\frac{2}{3} \div \frac{1}{6} \div 2 \\
 & = -\frac{2}{3} \times 6 \times \frac{1}{2} \\
 & = -2
 \end{aligned}$$

STEP 2

기본연산 집중연습 | 05~09

p. 22 ~ p. 23

1-1	-4	1-2	7	1-3	5
2-1	20	2-2	10	2-3	1
2-4	1	2-5	4	2-6	6
2-7	1	2-8	-7	2-9	1
2-10	-2				
3	노끈				

$$\begin{aligned}
 \text{1-1 } & \sqrt{(-4)^2} = 4 \text{ 이므로 4의 양의 제곱근 } a = 4 \\
 & \sqrt{36^2} = 36 \text{ 이므로 36의 음의 제곱근 } b = -6 \\
 & \therefore a + b = 4 + (-6) = -2
 \end{aligned}$$

$$\begin{aligned}
 \text{1-2 } & \sqrt{(-16)^2} = 16 \text{ 이므로 16의 양의 제곱근 } a = 4 \\
 & (-\sqrt{9})^2 = 9 \text{ 이므로 9의 음의 제곱근 } b = -3 \\
 & \therefore a - b = 4 - (-3) = 7
 \end{aligned}$$

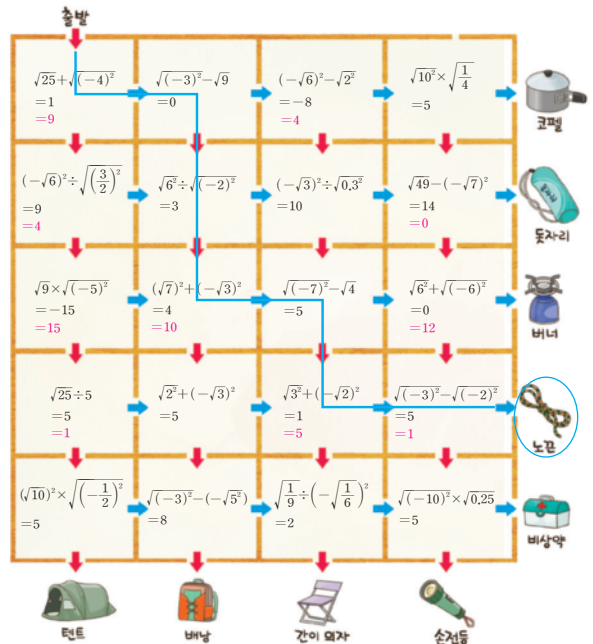
$$\begin{aligned}
 \text{1-3 } & (-\sqrt{81})^2 = 81 \text{ 이므로 81의 양의 제곱근 } a = 9 \\
 & (\sqrt{4})^2 = 4 \text{ 이므로 4의 음의 제곱근 } b = -2 \\
 & \therefore a + 2b = 9 + 2 \times (-2) = 9 + (-4) = 5
 \end{aligned}$$

$$\text{2-1 } (-\sqrt{13})^2 + (-\sqrt{7})^2 = 13 + 7 = 20$$

$$\text{2-2 } \sqrt{(-15)^2} - \sqrt{5^2} = 15 - 5 = 10$$

$$\text{2-3 } -\left(\sqrt{\frac{3}{2}}\right)^2 + \sqrt{\left(-\frac{5}{2}\right)^2} = -\frac{3}{2} + \frac{5}{2} = \frac{2}{2} = 1$$

3



STEP 1

10 $\sqrt{A^2}$ 의 성질 (1)

p. 24 ~ p. 25

1-1 $>, a$	1-2 $>, 4a$
2-1 $>, -2a$	2-2 $>, -5a$
3-1 $<, -, a$	3-2 $<, -, 7a$
4-1 $<, -5a, -5a$	4-2 $<, -10a, -10a$
5-1 $<, -a$	5-2 $<, -2a$
6-1 $<, 3a, 3a$	6-2 $<, 4a, 4a$
7-1 $>, -2a$	7-2 $>, -5a$
8-1 $>, -6a, 6a$	8-2 $>, -11a, 11a$
9-1 $a, -2a, 3a$	9-2 a
10-1 $-3a$	10-2 $5a$

9-2 $a > 0$ 일 때, $-5a < 0, -4a < 0$ 이므로

$$\sqrt{(-5a)^2} - \sqrt{(-4a)^2} = -(-5a) - \{-(-4a)\}$$

$$= 5a - 4a = a$$

10-1 $a < 0$ 일 때, $-2a > 0, -a > 0$ 이므로

$$\sqrt{(-2a)^2} + \sqrt{(-a)^2} = -2a + (-a) = -3a$$

10-2 $a < 0$ 일 때, $-3a > 0, 8a < 0$ 이므로

$$\sqrt{(-3a)^2} - \sqrt{(8a)^2} = -3a - (-8a) = 5a$$

11 $\sqrt{A^2}$ 의 성질 (2)

p. 26 ~ p. 27

1-1 $>, a-1$	1-2 $<, 1-a, a-1$
2-1 $>, a-1, 1-a$	2-2 $<, 1-a, 1-a$
3-1 $<, a+1, -a-1$	3-2 $>, -1-a$
4-1 $<, a+1, a+1$	4-2 $>, -1-a, 1+a$
5-1 $>, <, x+2, 3$	5-2 $2x-2$
6-1 6	6-2 $2x-3$
7-1 $2x-2$	7-2 -4
8-1 $-2x+5$	8-2 -6

5-2 $-1 < x < 3$ 일 때, $x+1 > 0, x-3 < 0$ 이므로

$$\sqrt{(x+1)^2} - \sqrt{(x-3)^2} = (x+1) - \{-(x-3)\}$$

$$= x+1+x-3 = 2x-2$$

6-1 $-4 < x < 2$ 일 때, $x-2 < 0, x+4 > 0$ 이므로

$$\sqrt{(x-2)^2} + \sqrt{(x+4)^2} = -(x-2) + (x+4)$$

$$= -x+2+x+4 = 6$$

6-2 $1 < x < 2$ 일 때, $1-x < 0, x-2 < 0$ 이므로

$$\sqrt{(1-x)^2} - \sqrt{(x-2)^2} = -(1-x) - \{-(x-2)\}$$

$$= -1+x+x-2 = 2x-3$$

7-1 $2 < x < 4$ 일 때, $x+2 > 0, x-4 < 0$ 이므로

$$\sqrt{(x+2)^2} - \sqrt{(x-4)^2} = (x+2) - \{-(x-4)\}$$

$$= x+2+x-4 = 2x-2$$

7-2 $x < -2$ 일 때, $x+2 < 0, x-2 < 0$ 이므로

$$\sqrt{(x+2)^2} - \sqrt{(x-2)^2} = -(x+2) - \{-(x-2)\}$$

$$= -x-2+x-2 = -4$$

8-1 $-1 < x < 2$ 일 때, $x-2 < 0, 3-x > 0$ 이므로

$$\sqrt{(x-2)^2} + \sqrt{(3-x)^2} = -(x-2) + (3-x)$$

$$= -x+2+3-x = -2x+5$$

8-2 $-3 < x < 3$ 일 때, $x+3 > 0, -x+3 > 0$ 이므로

$$-\sqrt{(x+3)^2} - \sqrt{(-x+3)^2} = -(x+3) - (-x+3)$$

$$= -x-3+x-3 = -6$$

12 제곱근의 대소 관계 (1)

p. 28

1-1 $<$	1-2 $>$
2-1 $<$	2-2 $<$
3-1 $>$	3-2 $<$
4-1 $<$	4-2 $>$
5-1 $>$	5-2 $>$

3-2 $\frac{1}{2} = \frac{3}{6}, \frac{2}{3} = \frac{4}{6}$ 이고 $\frac{3}{6} < \frac{4}{6}$ 이므로 $\sqrt{\frac{1}{2}} < \sqrt{\frac{2}{3}}$

5-2 $\frac{3}{5} = \frac{9}{15}, \frac{2}{3} = \frac{10}{15}$ 이고 $\frac{9}{15} < \frac{10}{15}$ 이므로 $\sqrt{\frac{3}{5}} < \sqrt{\frac{2}{3}}$
 양변에 -1 을 곱하면 $-\sqrt{\frac{3}{5}} > -\sqrt{\frac{2}{3}}$

13 제곱근의 대소 관계 (2)

p. 29 ~ p. 30

1-1 $<, <$	1-2 $<$
2-1 $>$	2-2 $>$
3-1 $<, >$	3-2 $<$
4-1 $<$	4-2 $>$
5-1 $<, <$	5-2 $>$
6-1 $>$	6-2 $>$
7-1 $>$	7-2 $>$
8-1 $<, <$	8-2 $>$
9-1 $<$	9-2 $>$
10-1 $<$	10-2 $<$

1-2 $4 = \sqrt{4^2} = \sqrt{16}$ 이고 $\sqrt{15} < \sqrt{16}$ 이므로 $\sqrt{15} < 4$

2-1 $8 = \sqrt{8^2} = \sqrt{64}$ 이고 $\sqrt{64} > \sqrt{60}$ 이므로 $8 > \sqrt{60}$

2-2 $7 = \sqrt{7^2} = \sqrt{49}$ 이고 $\sqrt{49} > \sqrt{48}$ 이므로 $7 > \sqrt{48}$

3-2 $3 = \sqrt{3^2} = \sqrt{9}$ 이고 $\sqrt{12} > \sqrt{9}$ 이므로
 $-\sqrt{12} < -\sqrt{9} \quad \therefore -\sqrt{12} < -3$

4-1 $5 = \sqrt{5^2} = \sqrt{25}$ 이고 $\sqrt{25} > \sqrt{24}$ 이므로
 $-\sqrt{25} < -\sqrt{24} \quad \therefore -5 < -\sqrt{24}$

4-2 $8 = \sqrt{8^2} = \sqrt{64}$ 이고 $\sqrt{64} < \sqrt{65}$ 이므로
 $-\sqrt{64} > -\sqrt{65} \quad \therefore -8 > -\sqrt{65}$

5-2 $0.5 = \sqrt{0.5^2} = \sqrt{0.25}$ 이고 $\sqrt{0.5} > \sqrt{0.25}$ 이므로
 $\sqrt{0.5} > 0.5$

6-1 $0.4 = \sqrt{0.4^2} = \sqrt{0.16}$ 이고 $\sqrt{1.6} > \sqrt{0.16}$ 이므로
 $\sqrt{1.6} > 0.4$

6-2 $0.2 = \sqrt{0.2^2} = \sqrt{0.04}$ 이고 $\sqrt{0.09} > \sqrt{0.04}$ 이므로
 $\sqrt{0.09} > 0.2$

7-1 $0.2 = \sqrt{0.2^2} = \sqrt{0.04}$ 이고 $\sqrt{0.04} < \sqrt{0.4}$ 이므로
 $-\sqrt{0.04} > -\sqrt{0.4} \quad \therefore -0.2 > -\sqrt{0.4}$

7-2 $0.1 = \sqrt{0.1^2} = \sqrt{0.01}$ 이고 $\sqrt{0.01} < \sqrt{0.09}$ 이므로
 $-\sqrt{0.01} > -\sqrt{0.09} \quad \therefore -0.1 > -\sqrt{0.09}$

8-2 $\frac{2}{3} = \sqrt{\left(\frac{2}{3}\right)^2} = \sqrt{\frac{4}{9}}$ 이고 $\sqrt{\frac{5}{9}} > \sqrt{\frac{4}{9}}$ 이므로
 $\sqrt{\frac{5}{9}} > \frac{2}{3}$

9-1 $\frac{1}{2} = \sqrt{\left(\frac{1}{2}\right)^2} = \sqrt{\frac{1}{4}}$ 이고 $\sqrt{\frac{1}{5}} < \sqrt{\frac{1}{4}}$ 이므로 $\sqrt{\frac{1}{5}} < \frac{1}{2}$

9-2 $\frac{1}{2} = \sqrt{\left(\frac{1}{2}\right)^2} = \sqrt{\frac{1}{4}}$ 이고 $\sqrt{\frac{1}{4}} < \sqrt{\frac{3}{4}}$ 이므로
 $-\sqrt{\frac{1}{4}} > -\sqrt{\frac{3}{4}} \quad \therefore -\frac{1}{2} > -\sqrt{\frac{3}{4}}$

10-1 $2 = \sqrt{2^2} = \sqrt{4} = \sqrt{\frac{8}{2}}$ 이고 $\sqrt{\frac{8}{2}} > \sqrt{\frac{5}{2}}$ 이므로
 $-\sqrt{\frac{8}{2}} < -\sqrt{\frac{5}{2}} \quad \therefore -2 < -\sqrt{\frac{5}{2}}$

10-2 $\frac{1}{6} = \sqrt{\left(\frac{1}{6}\right)^2} = \sqrt{\frac{1}{36}}$ 이고 $\sqrt{\frac{5}{12}} = \sqrt{\frac{15}{36}}$ 이므로
 $\sqrt{\frac{5}{12}} > \frac{1}{6} \quad \therefore -\sqrt{\frac{5}{12}} < -\frac{1}{6}$

14 제곱근을 포함한 부등식

p. 31

1-1 1, 2

1-2 10, 11, 12, 13, 14, 15

2-1 2, 3, 4, 5, 6, 7

2-2 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

3-1 $>, >, >, >, 7, 8$

3-2 2, 3

4-1 4, 5, 6

4-2 16, 17, 18, 19, 20, 21

1-2 $3 < \sqrt{x} < 4$ 의 각 변을 제곱하면 $9 < x < 16$
 따라서 자연수 x 의 값은 10, 11, 12, 13, 14, 15

2-1 $2 \leq \sqrt{2x} < 4$ 의 각 변을 제곱하면 $4 \leq 2x < 16$
 각 변을 2로 나누면 $2 \leq x < 8$
 따라서 자연수 x 의 값은 2, 3, 4, 5, 6, 7

2-2 $1 \leq \sqrt{\frac{x}{3}} \leq 2$ 의 각 변을 제곱하면 $1 \leq \frac{x}{3} \leq 4$

각 변에 3을 곱하면 $3 \leq x \leq 12$

따라서 자연수 x 의 값은 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

3-2 $-2 < -\sqrt{x} < -1$ 의 각 변에 -1 을 곱하면 $2 > \sqrt{x} > 1$
 각 변을 제곱하면 $1 < x < 4$
 따라서 자연수 x 의 값은 2, 3

4-1 $1 < \sqrt{x-2} \leq 2$ 의 각 변을 제곱하면 $1 < x-2 \leq 4$
 각 변에 2를 더하면 $3 < x \leq 6$
 따라서 자연수 x 의 값은 4, 5, 6

4-2 $3 < \sqrt{x-6} < 4$ 의 각 변을 제곱하면 $9 < x-6 < 16$
 각 변에 6을 더하면 $15 < x < 22$
 따라서 자연수 x 의 값은 16, 17, 18, 19, 20, 21

STEP 2

기본연산 집중연습 | 10~14

p. 32 ~ p. 33

1-1 $3a$

1-2 $2a$

1-3 $-3a$

1-4 a

1-5 $2a$

1-6 $2a$

1-7 $-8a$

1-8 $5a$

2-1 $6a$

2-2 $4a$

2-3 $-3a$

2-4 3

2-5 $2a+1$

2-6 $-2a+1$

3 2번 열쇠

2-1 $a > 0$ 일 때, $-9a < 0$, $3a > 0$ 이므로

$$\begin{aligned}\sqrt{(-9a)^2} - \sqrt{9a^2} &= \sqrt{(-9a)^2} - \sqrt{(3a)^2} \\ &= -(-9a) - 3a \\ &= 9a - 3a = 6a\end{aligned}$$

2-2 $a > 0$ 일 때, $9a > 0$, $-5a < 0$ 이므로

$$\begin{aligned}\sqrt{81a^2} - \sqrt{(-5a)^2} &= \sqrt{(9a)^2} - \sqrt{(-5a)^2} \\ &= 9a - \{ -(-5a) \} \\ &= 9a - 5a = 4a\end{aligned}$$

2-3 $a < 0$ 일 때, $4a < 0$, $7a < 0$ 이므로

$$\begin{aligned}-\sqrt{(4a)^2} + \sqrt{49a^2} &= -\sqrt{(4a)^2} + \sqrt{(7a)^2} \\ &= -(-4a) + (-7a) \\ &= 4a - 7a = -3a\end{aligned}$$

2-4 $-1 < a < 2$ 일 때, $a - 2 < 0$, $a + 1 > 0$ 이므로

$$\begin{aligned}\sqrt{(a-2)^2} + \sqrt{(a+1)^2} &= -(a-2) + (a+1) \\ &= -a + 2 + a + 1 = 3\end{aligned}$$

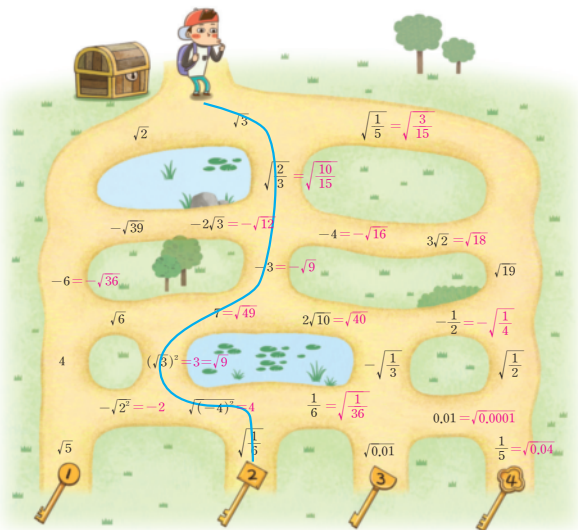
2-5 $-2 < a < 1$ 일 때, $a + 2 > 0$, $a - 1 < 0$ 이므로

$$\begin{aligned}\sqrt{(a+2)^2} - \sqrt{(a-1)^2} &= (a+2) - \{ -(a-1) \} \\ &= a + 2 + a - 1 = 2a + 1\end{aligned}$$

2-6 $-2 < a < 3$ 일 때, $a - 3 < 0$, $a + 2 > 0$ 이므로

$$\begin{aligned}\sqrt{(a-3)^2} - \sqrt{(a+2)^2} &= -(a-3) - (a+2) \\ &= -a + 3 - a - 2 = -2a + 1\end{aligned}$$

3



STEP 1

15 유리수와 무리수

p. 34 ~ p. 35

1-1 유 1-2 유 1-3 유

2-1 무 2-2 유 2-3 유

3-1 무 3-2 무 3-3 유

4-1 유 4-2 유 4-3 유

5-1 (1) $5, \sqrt{49}$ (2) $0, 5, \sqrt{49}, 3 - \sqrt{25}$

(3) $0, 2.\dot{3}\dot{5}, 5, \sqrt{49}, \sqrt{1.96}, 3 - \sqrt{25}$ (4) $-\sqrt{7}, \sqrt{\frac{2}{3}}$

5-2 (1) $\sqrt{25}$ (2) $-2, \sqrt{25}, -\sqrt{(-3)^2}$

(3) $-2, 0.24, \sqrt{25}, \sqrt{\frac{4}{9}}, -\sqrt{(-3)^2}$ (4) $\sqrt{8}, \pi, -\sqrt{0.02}$

6-1 ○

6-2 ×

7-1 ×

7-2 ○

8-1 ×

8-2 ×

3-3 $\sqrt{16} = 4$ 이므로 유리수이다.

4-1 $-\sqrt{\frac{1}{9}} = -\frac{1}{3}$ 이므로 유리수이다.

4-2 $\sqrt{0.01} = 0.1$ 이므로 유리수이다.

4-3 $\sqrt{\frac{25}{36}} = \frac{5}{6}$ 이므로 유리수이다.

5-1 $\sqrt{49} = 7, \sqrt{1.96} = 1.4, 3 - \sqrt{25} = 3 - 5 = -2$

5-2 $\sqrt{25} = 5, \sqrt{\frac{4}{9}} = \frac{2}{3}, -\sqrt{(-3)^2} = -3$

6-2 $\sqrt{5}$ 는 무리수이므로 $\frac{(\text{정수})}{(0\text{이 아닌 정수})}$ 꼴로 나타낼 수 없다.

7-1 $\sqrt{64} = 8$ 이므로 유리수이다.

8-1 무한소수 중 순환소수는 유리수이다.

8-2 근호를 사용하여 나타낸 수 중 근호 안의 수가 어떤 수의 제곱이면 유리수이다.

16 제곱근표를 보고 제곱근의 값 구하기

p. 36

1-1 (1) 2, 1.766 (2) 1.741 (3) 1.772 (4) 1.797 (5) 1.822

1-2 (1) 35, 6, 5.967 (2) 5.975 (3) 6.066 (4) 6.156 (5) 6.213

- 1-1 $\sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}$
 1-2 (1) 2 (2) $\sqrt{2}$ (3) $\sqrt{2}$ (4) $\sqrt{2}$ (5) $-\sqrt{2}$
 2-1 P: $2+\sqrt{2}$, Q: $2-\sqrt{2}$
 2-2 P: $-1+\sqrt{2}$, Q: $-1-\sqrt{2}$
 3-1 $\sqrt{2}, \sqrt{2}, \sqrt{2}, \sqrt{2}$
 3-2 P: $1+\sqrt{2}$, Q: $2-\sqrt{2}$
 3-3 P: $-1+\sqrt{2}$, Q: $-\sqrt{2}$
 4-1 $\sqrt{5}, \sqrt{5}, \sqrt{5}$
 4-2 (1) 5 (2) $\sqrt{5}$ (3) $\sqrt{5}$ (4) $-\sqrt{5}$ (5) $\sqrt{5}$
 5-1 P: $-1-\sqrt{5}$, Q: $-1+\sqrt{5}$
 5-2 P: $2-\sqrt{5}$, Q: $2+\sqrt{5}$
 6-1 $10, \sqrt{10}, \sqrt{10}, \sqrt{10}$
 6-2 P: $-\sqrt{10}$, Q: $\sqrt{10}$
 6-3 P: $-1-\sqrt{10}$, Q: $-1+\sqrt{10}$

- 1-2 (4) $\overline{AP}=\overline{AB}=\sqrt{2}$ 이고 점 P는 기준점 A(0)의 오른쪽에 있으므로 점 P에 대응하는 수는 $0+\sqrt{2}=\sqrt{2}$
 (5) $\overline{AQ}=\overline{AD}=\sqrt{2}$ 이고 점 Q는 기준점 A(0)의 왼쪽에 있으므로 점 Q에 대응하는 수는 $0-\sqrt{2}=-\sqrt{2}$

- 2-1 $\overline{AP}=\overline{AB}=\sqrt{2}$ 이고 점 P는 기준점 A(2)의 오른쪽에 있으므로 점 P에 대응하는 수는 $2+\sqrt{2}$
 $\overline{AQ}=\overline{AD}=\sqrt{2}$ 이고 점 Q는 기준점 A(2)의 왼쪽에 있으므로 점 Q에 대응하는 수는 $2-\sqrt{2}$

- 2-2 $\overline{AP}=\overline{AB}=\sqrt{2}$ 이고 점 P는 기준점 A(-1)의 오른쪽에 있으므로 점 P에 대응하는 수는 $-1+\sqrt{2}$
 $\overline{AQ}=\overline{AD}=\sqrt{2}$ 이고 점 Q는 기준점 A(-1)의 왼쪽에 있으므로 점 Q에 대응하는 수는 $-1-\sqrt{2}$

- 3-2 $\overline{BP}=\overline{BD}=\sqrt{2}$ 이고 점 P는 기준점 B(1)의 오른쪽에 있으므로 점 P에 대응하는 수는 $1+\sqrt{2}$
 $\overline{CQ}=\overline{CA}=\sqrt{2}$ 이고 점 Q는 기준점 C(2)의 왼쪽에 있으므로 점 Q에 대응하는 수는 $2-\sqrt{2}$

- 3-3 $\overline{BP}=\overline{BD}=\sqrt{2}$ 이고 점 P는 기준점 B(-1)의 오른쪽에 있으므로 점 P에 대응하는 수는 $-1+\sqrt{2}$
 $\overline{CQ}=\overline{CA}=\sqrt{2}$ 이고 점 Q는 기준점 C(0)의 왼쪽에 있으므로 점 Q에 대응하는 수는 $0-\sqrt{2}=-\sqrt{2}$

- 4-2 (4) $\overline{BP}=\overline{BA}=\sqrt{5}$ 이고 점 P는 기준점 B(0)의 왼쪽에 있으므로 점 P에 대응하는 수는 $0-\sqrt{5}=-\sqrt{5}$
 (5) $\overline{BQ}=\overline{BC}=\sqrt{5}$ 이고 점 Q는 기준점 B(0)의 오른쪽에 있으므로 점 Q에 대응하는 수는 $0+\sqrt{5}=\sqrt{5}$

- 5-1 $\overline{BP}=\overline{BA}=\sqrt{5}$ 이고 점 P는 기준점 B(-1)의 왼쪽에 있으므로 점 P에 대응하는 수는 $-1-\sqrt{5}$

$\overline{BQ}=\overline{BC}=\sqrt{5}$ 이고 점 Q는 기준점 B(-1)의 오른쪽에 있으므로 점 Q에 대응하는 수는 $-1+\sqrt{5}$

- 5-2 $\overline{BP}=\overline{BA}=\sqrt{5}$ 이고 점 P는 기준점 B(2)의 왼쪽에 있으므로 점 P에 대응하는 수는 $2-\sqrt{5}$
 $\overline{BQ}=\overline{BC}=\sqrt{5}$ 이고 점 Q는 기준점 B(2)의 오른쪽에 있으므로 점 Q에 대응하는 수는 $2+\sqrt{5}$

- 6-2 $\overline{BP}=\overline{BA}=\sqrt{10}$ 이고 점 P는 기준점 B(0)의 왼쪽에 있으므로 점 P에 대응하는 수는 $0-\sqrt{10}=-\sqrt{10}$
 $\overline{BQ}=\overline{BC}=\sqrt{10}$ 이고 점 Q는 기준점 B(0)의 오른쪽에 있으므로 점 Q에 대응하는 수는 $0+\sqrt{10}=\sqrt{10}$

- 6-3 $\overline{BP}=\overline{BA}=\sqrt{10}$ 이고 점 P는 기준점 B(-1)의 왼쪽에 있으므로 점 P에 대응하는 수는 $-1-\sqrt{10}$
 $\overline{BQ}=\overline{BC}=\sqrt{10}$ 이고 점 Q는 기준점 B(-1)의 오른쪽에 있으므로 점 Q에 대응하는 수는 $-1+\sqrt{10}$

18 두 실수의 대소 관계

- | | | | |
|-----|---------------|-----|---|
| 1-1 | <, >, > | 1-2 | > |
| 2-1 | < | 2-2 | < |
| 3-1 | <, < | 3-2 | > |
| 4-1 | > | 4-2 | > |
| 5-1 | 3, 4, 3, 2, > | 5-2 | > |
| 6-1 | < | 6-2 | < |
| 7-1 | < | 7-2 | > |
| 8-1 | < | 8-2 | > |
| 9-1 | > | 9-2 | < |

- 1-2 $-\sqrt{3} > -\sqrt{6}$ 이므로 $2-\sqrt{3} > 2-\sqrt{6}$

- 2-1 $\sqrt{3} < \sqrt{5}$ 이므로 $\sqrt{3}+1 < \sqrt{5}+1$

- 2-2 $\sqrt{5} < \sqrt{7}$ 이므로 $\sqrt{5}-2 < \sqrt{7}-2$

- 3-2 $-3 > -5$ 이므로 $\sqrt{6}-3 > \sqrt{6}-5$

- 4-1 $3 > \sqrt{5}$ 이므로 $3-\sqrt{7} > \sqrt{5}-\sqrt{7}$

- 4-2 $\sqrt{17} > 4$ 이므로 $\sqrt{17}+\sqrt{5} > 4+\sqrt{5}$

- 5-2 $\sqrt{10}-2=3. \times \times \times -2=1. \times \times \times$ 이므로 $\sqrt{10}-2 > 1$

- 6-1 $\sqrt{2}+3=1.414 \times \times \times +3=4.414 \times \times \times$ 이므로 $\sqrt{2}+3 < 5$

STEP 3

기본연산 테스트

p. 44 ~ p. 45

- 1 (1) ± 7 (2) ± 6 (3) $\pm\sqrt{21}$ (4) $\pm\sqrt{43}$ (5) $\pm\sqrt{11}$
 2 (1) \times (2) \times (3) \bigcirc (4) \times (5) \bigcirc
 3 (1) 8 (2) 15 (3) -5 (4) $\frac{2}{5}$ (5) -0.2
 4 (1) 11 (2) 2 (3) 30 (4) 3 (5) -15
 5 (1) $-x$ (2) $x+4$ (3) $-x+6$ (4) 1
 6 (1) $<$ (2) $<$ (3) $>$ (4) $<$
 7 $\sqrt{3}, \sqrt{\frac{4}{3}}, 0.101001000\cdots$
 8 (1) 10 (2) $\overline{AB}=\sqrt{10}, \overline{BC}=\sqrt{10}$ (3) $2-\sqrt{10}$ (4) $2+\sqrt{10}$
 9 (1) $<$ (2) $<$ (3) $>$ (4) $>$

- 4 (1) $\sqrt{4^2}+\sqrt{(-7)^2}=4+7=11$
 (2) $(-\sqrt{7})^2-(-\sqrt{5})^2=7-5=2$
 (3) $(\sqrt{5})^2\times(-\sqrt{6})^2=5\times6=30$
 (4) $\sqrt{12^2}\div\sqrt{(-4)^2}=12\div4=3$
 (5) $-\sqrt{(-5)^2}\div\sqrt{\frac{25}{81}}-(-\sqrt{6})^2$
 $=-5\div\frac{5}{9}-6=-5\times\frac{9}{5}-6=-15$
 5 (2) $x>-4$ 일 때, $x+4>0$ 이므로 $\sqrt{(x+4)^2}=x+4$
 (3) $x<6$ 일 때, $x-6<0$ 이므로
 $\sqrt{(x-6)^2}=-(x-6)=-x+6$
 (4) $2<x<3$ 일 때, $x-3<0, 2-x<0$ 이므로
 $\sqrt{(x-3)^2}+\sqrt{(2-x)^2}=-(x-3)+\{-(2-x)\}$
 $=-x+3-2+x=1$

- 6 (4) $\frac{1}{2}=\sqrt{\frac{1}{4}}$ 이고 $\frac{1}{4}=\frac{3}{12}, \frac{2}{3}=\frac{8}{12}$ 이므로
 $\sqrt{\frac{1}{4}}<\sqrt{\frac{2}{3}} \quad \therefore \frac{1}{2}<\sqrt{\frac{2}{3}}$

- 8 (1) $\square ABCD=4\times4-4\times\left(\frac{1}{2}\times3\times1\right)=10$
 (2) $\overline{AB}=\overline{BC}=\sqrt{10}$
 (3) $\overline{BP}=\overline{BA}=\sqrt{10}$ 이고 점 P는 기준점 B(2)의 왼쪽에 있으므로 점 P에 대응하는 수는 $2-\sqrt{10}$
 (4) $\overline{BQ}=\overline{BC}=\sqrt{10}$ 이고 점 Q는 기준점 B(2)의 오른쪽에 있으므로 점 Q에 대응하는 수는 $2+\sqrt{10}$
 9 (1) $\sqrt{3}+1=1.732\times\times\times+1=2.732\times\times\times$
 이므로 $2<\sqrt{3}+1$
 (2) $6-\sqrt{8}=6-2.\times\times\times=3.\times\times\times$ 이므로 $6-\sqrt{8}<4$
 (3) $-\sqrt{2}>-\sqrt{5}$ 이므로 $1-\sqrt{2}>-\sqrt{5}+1$
 (4) $3>\sqrt{7}$ 이므로 $\sqrt{6}+3>\sqrt{6}+\sqrt{7}$

2

제곱근을 포함한 식의 계산

STEP 1

01 제곱근의 곱셈 (1)

p. 48

- | | | | |
|-----|-------------|-----|-------------|
| 1-1 | 5, 15 | 1-2 | $\sqrt{66}$ |
| 2-1 | $\sqrt{21}$ | 2-2 | 6 |
| 3-1 | 4, 2 | 3-2 | 3 |
| 4-1 | $\sqrt{6}$ | 4-2 | $\sqrt{3}$ |
| 5-1 | $\sqrt{30}$ | 5-2 | $\sqrt{70}$ |

1-2 $\sqrt{6}\times\sqrt{11}=\sqrt{6\times11}=\sqrt{66}$

2-1 $\sqrt{3}\sqrt{7}=\sqrt{3\times7}=\sqrt{21}$

2-2 $\sqrt{3}\sqrt{12}=\sqrt{3\times12}=\sqrt{36}=6$

3-2 $\sqrt{39}\times\sqrt{\frac{3}{13}}=\sqrt{39\times\frac{3}{13}}=\sqrt{9}=3$

4-1 $\sqrt{\frac{14}{3}}\sqrt{\frac{9}{7}}=\sqrt{\frac{14}{3}\times\frac{9}{7}}=\sqrt{6}$

4-2 $\sqrt{\frac{4}{7}}\sqrt{\frac{21}{4}}=\sqrt{\frac{4}{7}\times\frac{21}{4}}=\sqrt{3}$

5-1 $\sqrt{2}\times\sqrt{3}\times\sqrt{5}=\sqrt{2\times3\times5}=\sqrt{30}$

5-2 $\sqrt{2}\sqrt{5}\sqrt{7}=\sqrt{2\times5\times7}=\sqrt{70}$

02 제곱근의 곱셈 (2)

p. 49

- | | | | |
|-----|---------------|-----|---------------|
| 1-1 | 2, 6 | 1-2 | $5\sqrt{15}$ |
| 2-1 | $12\sqrt{21}$ | 2-2 | $\sqrt{6}$ |
| 3-1 | $8\sqrt{6}$ | 3-2 | $12\sqrt{5}$ |
| 4-1 | -60 | 4-2 | $-6\sqrt{10}$ |
| 5-1 | -20 | 5-2 | 36 |

1-2 $\sqrt{3}\times5\sqrt{5}=(1\times5)\times\sqrt{3\times5}=5\sqrt{15}$

2-1 $4\sqrt{7}\times3\sqrt{3}=(4\times3)\times\sqrt{7\times3}=12\sqrt{21}$

2-2 $\frac{2}{3}\sqrt{2}\times\frac{3}{2}\sqrt{3}=\left(\frac{2}{3}\times\frac{3}{2}\right)\times\sqrt{2\times3}=\sqrt{6}$

3-1 $4\sqrt{6}\times2=(4\times2)\times\sqrt{6}=8\sqrt{6}$

3-2 $6\times2\sqrt{5}=(6\times2)\times\sqrt{5}=12\sqrt{5}$

$$4-1 \quad (-3\sqrt{5}) \times 4\sqrt{5} = \{(-3) \times 4\} \times \sqrt{5 \times 5} = -60$$

$$4-2 \quad 2\sqrt{5} \times (-3\sqrt{2}) = \{2 \times (-3)\} \times \sqrt{5 \times 2} = -6\sqrt{10}$$

$$5-1 \quad (-5\sqrt{2}) \times 2\sqrt{2} = \{(-5) \times 2\} \times \sqrt{2 \times 2} = -20$$

$$5-2 \quad (-2\sqrt{6}) \times (-3\sqrt{6}) = \{(-2) \times (-3)\} \times \sqrt{6 \times 6} = 36$$

03 근호가 있는 식의 변형 : 곱셈식 (1)

p. 50

$$1-1 \quad 3, 18$$

$$1-2 \quad \sqrt{20}$$

$$1-3 \quad \sqrt{90}$$

$$2-1 \quad \sqrt{24}$$

$$2-2 \quad \sqrt{50}$$

$$2-3 \quad \sqrt{48}$$

$$3-1 \quad 5, 75$$

$$3-2 \quad -\sqrt{44}$$

$$3-3 \quad -\sqrt{63}$$

$$4-1 \quad -\sqrt{700}$$

$$4-2 \quad -\sqrt{72}$$

$$4-3 \quad -\sqrt{60}$$

$$1-2 \quad 2\sqrt{5} = \sqrt{2^2 \times 5} = \sqrt{20}$$

$$1-3 \quad 3\sqrt{10} = \sqrt{3^2 \times 10} = \sqrt{90}$$

$$2-1 \quad 2\sqrt{6} = \sqrt{2^2 \times 6} = \sqrt{24}$$

$$2-2 \quad 5\sqrt{2} = \sqrt{5^2 \times 2} = \sqrt{50}$$

$$2-3 \quad 4\sqrt{3} = \sqrt{4^2 \times 3} = \sqrt{48}$$

$$3-2 \quad -2\sqrt{11} = -\sqrt{2^2 \times 11} = -\sqrt{44}$$

$$3-3 \quad -3\sqrt{7} = -\sqrt{3^2 \times 7} = -\sqrt{63}$$

$$4-1 \quad -10\sqrt{7} = -\sqrt{10^2 \times 7} = -\sqrt{700}$$

$$4-2 \quad -6\sqrt{2} = -\sqrt{6^2 \times 2} = -\sqrt{72}$$

$$4-3 \quad -2\sqrt{15} = -\sqrt{2^2 \times 15} = -\sqrt{60}$$

04 근호가 있는 식의 변형 : 곱셈식 (2)

p. 51 ~ p. 52

$$1-1 \quad 3, 3$$

$$1-2 \quad 2\sqrt{2}$$

$$1-3 \quad 3\sqrt{2}$$

$$2-1 \quad 2\sqrt{5}$$

$$2-2 \quad 2\sqrt{11}$$

$$2-3 \quad 5\sqrt{2}$$

$$3-1 \quad 2, 2$$

$$3-2 \quad -3\sqrt{5}$$

$$3-3 \quad -2\sqrt{13}$$

$$4-1 \quad -3\sqrt{7}$$

$$4-2 \quad -5\sqrt{3}$$

$$4-3 \quad -7\sqrt{2}$$

$$5-1 \quad 4, 4$$

$$5-2 \quad 4\sqrt{2}$$

$$5-3 \quad 4\sqrt{5}$$

$$6-1 \quad 3, 3$$

$$6-2 \quad 3\sqrt{10}$$

$$6-3 \quad 3\sqrt{15}$$

$$7-1 \quad -2\sqrt{10}$$

$$7-2 \quad -2\sqrt{14}$$

$$7-3 \quad -2\sqrt{34}$$

$$8-1 \quad 6, 6$$

$$8-2 \quad 6\sqrt{5}$$

$$8-3 \quad 10\sqrt{3}$$

$$9-1 \quad -6\sqrt{3}$$

$$9-2 \quad -15\sqrt{2}$$

$$9-3 \quad -10\sqrt{10}$$

$$1-2 \quad \sqrt{8} = \sqrt{2^2 \times 2} = 2\sqrt{2}$$

$$1-3 \quad \sqrt{18} = \sqrt{3^2 \times 2} = 3\sqrt{2}$$

$$2-1 \quad \sqrt{20} = \sqrt{2^2 \times 5} = 2\sqrt{5}$$

$$2-2 \quad \sqrt{44} = \sqrt{2^2 \times 11} = 2\sqrt{11}$$

$$2-3 \quad \sqrt{50} = \sqrt{5^2 \times 2} = 5\sqrt{2}$$

$$3-2 \quad -\sqrt{45} = -\sqrt{3^2 \times 5} = -3\sqrt{5}$$

$$3-3 \quad -\sqrt{52} = -\sqrt{2^2 \times 13} = -2\sqrt{13}$$

$$4-1 \quad -\sqrt{63} = -\sqrt{3^2 \times 7} = -3\sqrt{7}$$

$$4-2 \quad -\sqrt{75} = -\sqrt{5^2 \times 3} = -5\sqrt{3}$$

$$4-3 \quad -\sqrt{98} = -\sqrt{7^2 \times 2} = -7\sqrt{2}$$

$$5-2 \quad \sqrt{32} = \sqrt{2^5} = \sqrt{2^4 \times 2} = \sqrt{4^2 \times 2} = 4\sqrt{2}$$

$$5-3 \quad \sqrt{80} = \sqrt{2^4 \times 5} = \sqrt{4^2 \times 5} = 4\sqrt{5}$$

$$6-2 \quad \sqrt{90} = \sqrt{2 \times 3^2 \times 5} = 3\sqrt{10}$$

$$6-3 \quad \sqrt{135} = \sqrt{3^3 \times 5} = \sqrt{3^2 \times 3 \times 5} = 3\sqrt{15}$$

$$7-1 \quad -\sqrt{40} = -\sqrt{2^3 \times 5} = -\sqrt{2^2 \times 2 \times 5} = -2\sqrt{10}$$

$$7-2 \quad -\sqrt{56} = -\sqrt{2^3 \times 7} = -\sqrt{2^2 \times 2 \times 7} = -2\sqrt{14}$$

$$7-3 \quad -\sqrt{136} = -\sqrt{2^3 \times 17} = -\sqrt{2^2 \times 2 \times 17} = -2\sqrt{34}$$

$$8-2 \quad \sqrt{180} = \sqrt{2^2 \times 3^2 \times 5} = \sqrt{6^2 \times 5} = 6\sqrt{5}$$

$$8-3 \quad \sqrt{300} = \sqrt{2^2 \times 3 \times 5^2} = \sqrt{10^2 \times 3} = 10\sqrt{3}$$

$$9-1 \quad -\sqrt{108} = -\sqrt{2^2 \times 3^3} = -\sqrt{2^2 \times 3^2 \times 3} \\ = -\sqrt{6^2 \times 3} = -6\sqrt{3}$$

$$9-2 \quad -\sqrt{450} = -\sqrt{2 \times 3^2 \times 5^2} = -\sqrt{15^2 \times 2} = -15\sqrt{2}$$

$$9-3 \quad -\sqrt{1000} = -\sqrt{2^3 \times 5^3} = -\sqrt{2^2 \times 5^2 \times 2 \times 5} \\ = -\sqrt{10^2 \times 10} = -10\sqrt{10}$$

05 근호가 있는 식의 변형을 이용한 대소 비교

p. 53

- 1-1 $18, <$ 1-2 $<$
 2-1 $>$ 2-2 $>$
 3-1 $<$ 3-2 $>$
 4-1 $>$ 4-2 $<$
 5-1 $<$ 5-2 $<$

1-2 $2\sqrt{7} = \sqrt{2^2 \times 7} = \sqrt{28}$ 이므로 $2\sqrt{7} < \sqrt{29}$

2-1 $4\sqrt{3} = \sqrt{4^2 \times 3} = \sqrt{48}$, $2\sqrt{5} = \sqrt{2^2 \times 5} = \sqrt{20}$ 이므로
 $4\sqrt{3} > 2\sqrt{5}$

2-2 $2\sqrt{5} = \sqrt{2^2 \times 5} = \sqrt{20}$, $3\sqrt{2} = \sqrt{3^2 \times 2} = \sqrt{18}$ 이므로
 $2\sqrt{5} > 3\sqrt{2}$

3-1 $-2\sqrt{3} = -\sqrt{2^2 \times 3} = -\sqrt{12}$ 이므로 $-2\sqrt{3} < -\sqrt{10}$

3-2 $-2\sqrt{2} = -\sqrt{2^2 \times 2} = -\sqrt{8}$ 이므로 $-\sqrt{7} > -2\sqrt{2}$

4-1 $-4\sqrt{2} = -\sqrt{4^2 \times 2} = -\sqrt{32}$, $-6 = -\sqrt{6^2} = -\sqrt{36}$ 이므로
 $-4\sqrt{2} > -6$

4-2 $-5\sqrt{2} = -\sqrt{5^2 \times 2} = -\sqrt{50}$, $-7 = -\sqrt{7^2} = -\sqrt{49}$ 이므로
 $-5\sqrt{2} < -7$

5-1 $2\sqrt{3} = \sqrt{2^2 \times 3} = \sqrt{12}$, $3\sqrt{2} = \sqrt{3^2 \times 2} = \sqrt{18}$ 이므로
 $2\sqrt{3} < 3\sqrt{2}$ $\therefore 2\sqrt{3} + 1 < 3\sqrt{2} + 1$

5-2 $-4\sqrt{3} = -\sqrt{4^2 \times 3} = -\sqrt{48}$, $-3\sqrt{5} = -\sqrt{3^2 \times 5} = -\sqrt{45}$
 이므로 $-4\sqrt{3} < -3\sqrt{5}$
 $\therefore -4\sqrt{3} + 1 < -3\sqrt{5} + 1$

06 근호가 있는 식의 변형을 이용한 제곱근의 곱셈

p. 54 ~ p. 55

- 1-1 $2, 3, 2, 3, 6\sqrt{21}$ 1-2 $4\sqrt{10}$
 2-1 $4\sqrt{30}$ 2-2 $15\sqrt{6}$
 3-1 $3, 3, 6$ 3-2 24
 4-1 36 4-2 18
 5-1 $7, 7, 7\sqrt{6}$ 5-2 $3\sqrt{5}$
 6-1 $2\sqrt{15}$ 6-2 $7\sqrt{3}$
 7-1 $5\sqrt{14}$ 7-2 $11\sqrt{3}$
 8-1 $-24\sqrt{6}$ 8-2 30
 9-1 $21\sqrt{3}$ 9-2 $25\sqrt{10}$

1-2 $2\sqrt{5} \times \sqrt{8} = 2\sqrt{5} \times 2\sqrt{2} = 4\sqrt{10}$

2-1 $\sqrt{20} \times \sqrt{24} = 2\sqrt{5} \times 2\sqrt{6} = 4\sqrt{30}$

2-2 $\sqrt{27} \times \sqrt{50} = 3\sqrt{3} \times 5\sqrt{2} = 15\sqrt{6}$

3-2 $\sqrt{12} \times \sqrt{48} = 2\sqrt{3} \times 4\sqrt{3} = 8 \times (\sqrt{3})^2 = 24$

4-1 $3\sqrt{6} \times \sqrt{24} = 3\sqrt{6} \times 2\sqrt{6} = 6 \times (\sqrt{6})^2 = 36$

4-2 $\sqrt{27} \times 2\sqrt{3} = 3\sqrt{3} \times 2\sqrt{3} = 6 \times (\sqrt{3})^2 = 18$

5-2 $\sqrt{3} \times \sqrt{15} = \sqrt{3} \times \sqrt{3 \times 5} = \sqrt{3^2 \times 5} = 3\sqrt{5}$

6-1 $\sqrt{6} \times \sqrt{10} = \sqrt{2 \times 3} \times \sqrt{2 \times 5} = \sqrt{2^2 \times 3 \times 5} = 2\sqrt{15}$

6-2 $\sqrt{7} \times \sqrt{21} = \sqrt{7} \times \sqrt{3 \times 7} = \sqrt{3 \times 7^2} = 7\sqrt{3}$

7-1 $\sqrt{10} \times \sqrt{35} = \sqrt{2 \times 5} \times \sqrt{5 \times 7} = \sqrt{2 \times 5^2 \times 7} = 5\sqrt{14}$

7-2 $\sqrt{33} \times \sqrt{11} = \sqrt{3 \times 11} \times \sqrt{11} = \sqrt{3 \times 11^2} = 11\sqrt{3}$

8-1 $(-\sqrt{48}) \times \sqrt{72} = (-4\sqrt{3}) \times 6\sqrt{2} = -24\sqrt{6}$

8-2 $\sqrt{12} \times \sqrt{75} = 2\sqrt{3} \times 5\sqrt{3} = 30$

9-1 $(-\sqrt{21}) \times (-\sqrt{63}) = (-\sqrt{3 \times 7}) \times (-\sqrt{3^2 \times 7})$
 $= \sqrt{3^2 \times 7^2 \times 3} = \sqrt{21^2 \times 3} = 21\sqrt{3}$

9-2 $\sqrt{125} \times \sqrt{50} = 5\sqrt{5} \times 5\sqrt{2} = 25\sqrt{10}$

STEP 2

기본연산 집중연습 | 01~06

p. 56 ~ p. 57

- 1-1 ○ 1-2 ×
 1-3 ○ 1-4 ×
 1-5 ○ 1-6 ×
 1-7 × 1-8 ○
 2-1 > 2-2 <
 2-3 < 2-4 <
 2-5 < 2-6 <
 2-7 > 2-8 >
 3-1 $10\sqrt{6}$ 3-2 $12\sqrt{5}$
 3-3 $36\sqrt{2}$ 3-4 $-10\sqrt{6}$
 3-5 10 3-6 $-5\sqrt{21}$
 3-7 $-\sqrt{2}$ 3-8 $-2\sqrt{3}$
 3-9 $14\sqrt{3}$ 3-10 $56\sqrt{3}$
 3-11 $12\sqrt{2}$ 3-12 $36\sqrt{6}$

$$1-2 \quad -5\sqrt{3} = -\sqrt{5^2 \times 3} = -\sqrt{75}$$

$$1-4 \quad \sqrt{44} = \sqrt{2^2 \times 11} = 2\sqrt{11}$$

$$1-6 \quad -\sqrt{162} = -\sqrt{2 \times 3^4} = -\sqrt{2 \times 9^2} = -9\sqrt{2}$$

$$1-7 \quad -\sqrt{80} = -\sqrt{2^4 \times 5} = -\sqrt{4^2 \times 5} = -4\sqrt{5}$$

$$2-1 \quad 3 = \sqrt{3^2} = \sqrt{9}, 2\sqrt{2} = \sqrt{2^2 \times 2} = \sqrt{8} \circ \text{이므로 } 3 > 2\sqrt{2}$$

$$2-2 \quad 3\sqrt{2} = \sqrt{3^2 \times 2} = \sqrt{18} \circ \text{이므로 } \sqrt{15} < 3\sqrt{2}$$

$$2-3 \quad -2\sqrt{2} = -\sqrt{2^2 \times 2} = -\sqrt{8} \circ \text{이므로 } -2\sqrt{2} < -\sqrt{7}$$

$$2-4 \quad 5\sqrt{3} = \sqrt{5^2 \times 3} = \sqrt{75}, 4\sqrt{5} = \sqrt{4^2 \times 5} = \sqrt{80} \circ \text{이므로 } 5\sqrt{3} < 4\sqrt{5}$$

$$2-5 \quad -5 = -\sqrt{5^2} = -\sqrt{25}, -2\sqrt{6} = -\sqrt{2^2 \times 6} = -\sqrt{24} \circ \text{이므로 } -5 < -2\sqrt{6}$$

$$2-6 \quad 4\sqrt{3} = \sqrt{4^2 \times 3} = \sqrt{48}, 7 = \sqrt{7^2} = \sqrt{49} \circ \text{이므로 } 4\sqrt{3} < 7$$

$$2-7 \quad -2\sqrt{3} = -\sqrt{2^2 \times 3} = -\sqrt{12}, -3\sqrt{2} = -\sqrt{3^2 \times 2} = -\sqrt{18} \circ \text{이므로 } -2\sqrt{3} > -3\sqrt{2}$$

$$2-8 \quad 3\sqrt{6} = \sqrt{3^2 \times 6} = \sqrt{54}, 5\sqrt{2} = \sqrt{5^2 \times 2} = \sqrt{50} \circ \text{이므로 } 3\sqrt{6} > 5\sqrt{2}$$

$$3-1 \quad 5\sqrt{\frac{15}{7}} \times 2\sqrt{\frac{14}{5}} = (5 \times 2) \times \sqrt{\frac{15}{7} \times \frac{14}{5}} = 10\sqrt{6}$$

$$3-2 \quad 6\sqrt{\frac{15}{2}} \times \sqrt{\frac{8}{3}} = 6 \times \sqrt{\frac{15}{2} \times \frac{8}{3}} = 6 \times \sqrt{20} \\ = 6 \times 2\sqrt{5} = 12\sqrt{5}$$

$$3-3 \quad 6\sqrt{3} \times 2\sqrt{6} = 12\sqrt{18} = 12 \times 3\sqrt{2} = 36\sqrt{2}$$

$$3-4 \quad (-2\sqrt{2}) \times 5\sqrt{3} = -10\sqrt{6}$$

$$3-5 \quad \sqrt{2} \times \sqrt{50} = \sqrt{2 \times 50} = 10$$

$$3-6 \quad (-\sqrt{15}) \times \sqrt{35} = (-\sqrt{3 \times 5}) \times \sqrt{5 \times 7} \\ = -\sqrt{3 \times 5^2 \times 7} = -5\sqrt{21}$$

$$3-7 \quad \sqrt{\frac{10}{3}} \times \left(-\sqrt{\frac{3}{5}}\right) = -\sqrt{\frac{10}{3} \times \frac{3}{5}} = -\sqrt{2}$$

$$3-8 \quad \left(-\sqrt{\frac{2}{5}}\right) \times \sqrt{30} = -\sqrt{\frac{2}{5} \times 30} = -\sqrt{12} = -2\sqrt{3}$$

$$3-9 \quad \sqrt{14} \times \sqrt{42} = \sqrt{2 \times 7} \times \sqrt{2 \times 3 \times 7} = \sqrt{2^2 \times 7^2 \times 3} = 14\sqrt{3}$$

$$3-10 \quad 4\sqrt{7} \times 2\sqrt{21} = 4\sqrt{7} \times 2\sqrt{3 \times 7} = 8\sqrt{3 \times 7^2} = 56\sqrt{3}$$

$$3-11 \quad \sqrt{12} \times \sqrt{24} = 2\sqrt{3} \times 2\sqrt{6} = 4\sqrt{18} = 4 \times 3\sqrt{2} = 12\sqrt{2}$$

$$3-12 \quad \sqrt{72} \times \sqrt{108} = 6\sqrt{2} \times 6\sqrt{3} = 36\sqrt{6}$$

STEP 1

07 제곱근의 나눗셈 (1)

p. 58

$$1-1 \quad 5, \sqrt{2}$$

$$1-2 \quad \sqrt{3}$$

$$2-1 \quad 2$$

$$2-2 \quad 2\sqrt{2}$$

$$3-1 \quad \sqrt{5}$$

$$3-2 \quad -3$$

$$4-1 \quad \frac{9}{2}, \sqrt{6}$$

$$4-2 \quad 2\sqrt{3}$$

$$5-1 \quad 4$$

$$5-2 \quad -3$$

$$1-2 \quad \sqrt{12} \div \sqrt{4} = \frac{\sqrt{12}}{\sqrt{4}} = \sqrt{\frac{12}{4}} = \sqrt{3}$$

$$2-1 \quad \sqrt{24} \div \sqrt{6} = \frac{\sqrt{24}}{\sqrt{6}} = \sqrt{\frac{24}{6}} = \sqrt{4} = 2$$

$$2-2 \quad \sqrt{48} \div \sqrt{6} = \frac{\sqrt{48}}{\sqrt{6}} = \sqrt{\frac{48}{6}} = \sqrt{8} = 2\sqrt{2}$$

$$3-1 \quad \frac{\sqrt{45}}{\sqrt{9}} = \sqrt{\frac{45}{9}} = \sqrt{5}$$

$$3-2 \quad -\frac{\sqrt{63}}{\sqrt{7}} = -\sqrt{\frac{63}{7}} = -\sqrt{9} = -3$$

$$4-2 \quad \sqrt{\frac{9}{5}} \div \sqrt{\frac{3}{20}} = \sqrt{\frac{9}{5} \div \frac{3}{20}} = \sqrt{\frac{9}{5} \times \frac{20}{3}} \\ = \sqrt{12} = 2\sqrt{3}$$

$$5-1 \quad \sqrt{30} \div \frac{\sqrt{15}}{\sqrt{8}} = \sqrt{30 \div \frac{15}{8}} = \sqrt{30 \times \frac{8}{15}} = \sqrt{16} = 4$$

$$\begin{aligned}
 \text{5-2 } (-\sqrt{39}) \div \sqrt{\frac{13}{3}} &= -\sqrt{39 \div \frac{13}{3}} \\
 &= -\sqrt{39 \times \frac{3}{13}} \\
 &= -\sqrt{9} = -3
 \end{aligned}$$

08 제곱근의 나눗셈 (2)

p. 59

1-1 $2, 4\sqrt{2}$	1-2 $5\sqrt{2}$
2-1 $4\sqrt{2}$	2-2 $5\sqrt{7}$
3-1 $\frac{2}{3}\sqrt{2}$	3-2 $2\sqrt{17}$
4-1 $-2\sqrt{6}$	4-2 $-12\sqrt{5}$
5-1 $-2\sqrt{2}$	5-2 $3\sqrt{5}$

$$1-2 \quad 15\sqrt{12} \div 3\sqrt{6} = \frac{15\sqrt{12}}{3\sqrt{6}} = \frac{15}{3} \sqrt{\frac{12}{6}} = 5\sqrt{2}$$

$$2-1 \quad 4\sqrt{14} \div \sqrt{7} = \frac{4\sqrt{14}}{\sqrt{7}} = 4\sqrt{\frac{14}{7}} = 4\sqrt{2}$$

$$2-2 \quad 5\sqrt{21} \div \sqrt{3} = \frac{5\sqrt{21}}{\sqrt{3}} = 5\sqrt{\frac{21}{3}} = 5\sqrt{7}$$

$$3-1 \quad 2\sqrt{12} \div 3\sqrt{6} = \frac{2\sqrt{12}}{3\sqrt{6}} = \frac{2}{3} \sqrt{\frac{12}{6}} = \frac{2}{3}\sqrt{2}$$

$$3-2 \quad 8\sqrt{34} \div 4\sqrt{2} = \frac{8\sqrt{34}}{4\sqrt{2}} = \frac{8}{4} \sqrt{\frac{34}{2}} = 2\sqrt{17}$$

$$4-1 \quad (-4\sqrt{30}) \div 2\sqrt{5} = -\frac{4\sqrt{30}}{2\sqrt{5}} = -\frac{4}{2} \sqrt{\frac{30}{5}} = -2\sqrt{6}$$

$$4-2 \quad 12\sqrt{10} \div (-\sqrt{2}) = -12\sqrt{\frac{10}{2}} = -12\sqrt{5}$$

$$5-1 \quad 10\sqrt{6} \div (-5\sqrt{3}) = -\frac{10\sqrt{6}}{5\sqrt{3}} = -2\sqrt{2}$$

$$5-2 \quad (-9\sqrt{15}) \div (-3\sqrt{5}) = \frac{9\sqrt{15}}{3\sqrt{5}} = \frac{9}{3} \sqrt{\frac{15}{5}} = 3\sqrt{3}$$

09 근호가 있는 식의 변형 : 나눗셈식 (1)

p. 60

1-1 $3, 9$	1-2 $\sqrt{\frac{13}{4}}$
2-1 $\sqrt{\frac{6}{25}}$	2-2 $\sqrt{\frac{7}{9}}$
3-1 $-\sqrt{\frac{91}{81}}$	3-2 $-\sqrt{\frac{15}{16}}$
4-1 $5, 25$	4-2 $\sqrt{\frac{44}{9}}$
5-1 $\sqrt{\frac{27}{4}}$	5-2 $\sqrt{\frac{12}{49}}$

$$1-2 \quad \frac{\sqrt{13}}{2} = \frac{\sqrt{13}}{\sqrt{2^2}} = \sqrt{\frac{13}{2^2}} = \sqrt{\frac{13}{4}}$$

$$2-1 \quad \frac{\sqrt{6}}{5} = \frac{\sqrt{6}}{\sqrt{5^2}} = \sqrt{\frac{6}{5^2}} = \sqrt{\frac{6}{25}}$$

$$2-2 \quad \frac{\sqrt{7}}{3} = \frac{\sqrt{7}}{\sqrt{3^2}} = \sqrt{\frac{7}{3^2}} = \sqrt{\frac{7}{9}}$$

$$3-1 \quad -\frac{\sqrt{91}}{9} = -\frac{\sqrt{91}}{\sqrt{9^2}} = -\sqrt{\frac{91}{9^2}} = -\sqrt{\frac{91}{81}}$$

$$3-2 \quad -\frac{\sqrt{15}}{4} = -\frac{\sqrt{15}}{\sqrt{4^2}} = -\sqrt{\frac{15}{4^2}} = -\sqrt{\frac{15}{16}}$$

$$4-2 \quad \frac{2\sqrt{11}}{3} = \sqrt{\frac{2^2 \times 11}{3^2}} = \sqrt{\frac{44}{9}}$$

$$5-1 \quad \frac{3\sqrt{3}}{2} = \sqrt{\frac{3^2 \times 3}{2^2}} = \sqrt{\frac{27}{4}}$$

$$5-2 \quad \frac{2\sqrt{3}}{7} = \sqrt{\frac{2^2 \times 3}{7^2}} = \sqrt{\frac{12}{49}}$$

10 근호가 있는 식의 변형 : 나눗셈식 (2)

p. 61

1-1 $5, 5, 5$	1-2 $\frac{\sqrt{21}}{2}$
2-1 $\frac{\sqrt{11}}{6}$	2-2 $\frac{\sqrt{7}}{10}$
3-1 $10, 10$	3-2 $\frac{\sqrt{11}}{10}$
4-1 $\frac{3\sqrt{2}}{10}$	4-2 $\frac{3\sqrt{3}}{10}$
5-1 10	5-2 $\frac{\sqrt{5}}{5}$

$$1-2 \quad \sqrt{\frac{21}{4}} = \sqrt{\frac{21}{2^2}} = \frac{\sqrt{21}}{\sqrt{2^2}} = \frac{\sqrt{21}}{2}$$

$$2-1 \quad \sqrt{\frac{11}{36}} = \sqrt{\frac{11}{6^2}} = \frac{\sqrt{11}}{\sqrt{6^2}} = \frac{\sqrt{11}}{6}$$

$$2-2 \quad \sqrt{\frac{7}{100}} = \sqrt{\frac{7}{10^2}} = \frac{\sqrt{7}}{\sqrt{10^2}} = \frac{\sqrt{7}}{10}$$

$$3-2 \quad \sqrt{0.11} = \sqrt{\frac{11}{100}} = \sqrt{\frac{11}{10^2}} = \frac{\sqrt{11}}{10}$$

$$4-1 \quad \sqrt{0.18} = \sqrt{\frac{18}{100}} = \sqrt{\frac{18}{10^2}} = \frac{\sqrt{18}}{10} = \frac{3\sqrt{2}}{10}$$

$$4-2 \quad \sqrt{0.27} = \sqrt{\frac{27}{100}} = \sqrt{\frac{27}{10^2}} = \frac{\sqrt{27}}{10} = \frac{3\sqrt{3}}{10}$$

$$5-2 \quad \sqrt{0.2} = \sqrt{\frac{20}{100}} = \sqrt{\frac{20}{10^2}} = \frac{\sqrt{20}}{10} = \frac{2\sqrt{5}}{10} = \frac{\sqrt{5}}{5}$$

$$7-2 \quad \sqrt{7530} = \sqrt{75.3 \times 100} = 10\sqrt{75.3} = 10 \times 8.678 = 86.78$$

$$8-1 \quad \sqrt{75300} = \sqrt{7.53 \times 10000} = 100\sqrt{7.53} \\ = 100 \times 2.744 = 274.4$$

$$8-2 \quad \sqrt{753000} = \sqrt{75.3 \times 10000} = 100\sqrt{75.3} \\ = 100 \times 8.678 = 867.8$$

$$9-1 \quad \sqrt{0.753} = \sqrt{\frac{75.3}{100}} = \frac{\sqrt{75.3}}{10} = \frac{8.678}{10} = 0.8678$$

$$9-2 \quad \sqrt{0.0753} = \sqrt{\frac{7.53}{100}} = \frac{\sqrt{7.53}}{10} = \frac{2.744}{10} = 0.2744$$

11 제곱근표에 없는 제곱근의 값 구하기 p. 62 ~ p. 63

1-1 100, 10, 10, 17.32	1-2 100, 10, 10, 54.77
2-1 3, 3, 1.732, 173.2	2-2 100, 10, 10, 0.1732
3-1 30, 30, 5.477, 0.5477	3-2 3, 3, 1.732, 0.01732
4-1 14.14	4-2 44.72
5-1 141.4	5-2 0.4472
6-1 0.1414	6-2 0.04472
7-1 27.44	7-2 86.78
8-1 274.4	8-2 867.8
9-1 0.8678	9-2 0.2744

$$4-1 \quad \sqrt{200} = \sqrt{2 \times 100} = 10\sqrt{2} = 10 \times 1.414 = 14.14$$

$$4-2 \quad \sqrt{2000} = \sqrt{20 \times 100} = 10\sqrt{20} = 10 \times 4.472 = 44.72$$

$$5-1 \quad \sqrt{20000} = \sqrt{2 \times 10000} = 100\sqrt{2} = 100 \times 1.414 = 141.4$$

$$5-2 \quad \sqrt{0.2} = \sqrt{\frac{20}{100}} = \frac{\sqrt{20}}{10} = \frac{4.472}{10} = 0.4472$$

$$6-1 \quad \sqrt{0.02} = \sqrt{\frac{2}{100}} = \frac{\sqrt{2}}{10} = \frac{1.414}{10} = 0.1414$$

$$6-2 \quad \sqrt{0.002} = \sqrt{\frac{20}{10000}} = \frac{\sqrt{20}}{100} = \frac{4.472}{100} = 0.04472$$

$$7-1 \quad \sqrt{753} = \sqrt{7.53 \times 100} = 10\sqrt{7.53} = 10 \times 2.744 = 27.44$$

STEP 2

기본연산 집중연습 | 07~11

p. 64 ~ p. 65

1-1 ○	1-2 ×
1-3 ○	1-4 ○
1-5 ○	1-6 ○
1-7 ×	1-8 ×
2-1 24.49	2-2 77.46
2-3 244.9	2-4 0.7746
2-5 0.2449	2-6 0.07746
3-1 $4\sqrt{2}$	3-2 $2\sqrt{5}$
3-3 $-2\sqrt{6}$	3-4 $2\sqrt{6}$
3-5 -10	3-6 -6
3-7 $2\sqrt{7}$	3-8 $\sqrt{14}$
3-9 -1	3-10 7

후다닥

$$1-2 \quad -\frac{\sqrt{3}}{2} = -\sqrt{\frac{3}{2^2}} = -\sqrt{\frac{3}{4}}$$

$$1-7 \quad \sqrt{\frac{15}{20}} = \sqrt{\frac{3}{4}} = \sqrt{\frac{3}{2^2}} = \frac{\sqrt{3}}{2}$$

$$1-8 \quad \sqrt{0.07} = \sqrt{\frac{7}{100}} = \frac{\sqrt{7}}{10}$$

$$2-1 \quad \sqrt{600} = \sqrt{6 \times 100} = 10\sqrt{6} = 10 \times 2.449 = 24.49$$

$$2-2 \quad \sqrt{6000} = \sqrt{60 \times 100} = 10\sqrt{60} = 10 \times 7.746 = 77.46$$

$$\mathbf{2-3} \quad \sqrt{60000} = \sqrt{6 \times 10000} = 100\sqrt{6} = 100 \times 2.449 = 244.9$$

$$\mathbf{2-4} \quad \sqrt{0.6} = \sqrt{\frac{60}{100}} = \frac{\sqrt{60}}{10} = \frac{7.746}{10} = 0.7746$$

$$\mathbf{2-5} \quad \sqrt{0.06} = \sqrt{\frac{6}{100}} = \frac{\sqrt{6}}{10} = \frac{2.449}{10} = 0.2449$$

$$\mathbf{2-6} \quad \sqrt{0.006} = \sqrt{\frac{60}{10000}} = \frac{\sqrt{60}}{100} = \frac{7.746}{100} = 0.07746$$

$$\mathbf{3-1} \quad 8\sqrt{6} \div 2\sqrt{3} = \frac{8\sqrt{6}}{2\sqrt{3}} = \frac{8}{2} \sqrt{\frac{6}{3}} = 4\sqrt{2}$$

$$\mathbf{3-2} \quad 10\sqrt{15} \div 5\sqrt{3} = \frac{10\sqrt{15}}{5\sqrt{3}} = \frac{10}{5} \sqrt{\frac{15}{3}} = 2\sqrt{5}$$

$$\mathbf{3-3} \quad 6\sqrt{18} \div (-3\sqrt{3}) = -\frac{6\sqrt{18}}{3\sqrt{3}} = -\frac{6}{3} \sqrt{\frac{18}{3}} = -2\sqrt{6}$$

$$\mathbf{3-4} \quad 4\sqrt{30} \div 2\sqrt{5} = \frac{4\sqrt{30}}{2\sqrt{5}} = \frac{4}{2} \sqrt{\frac{30}{5}} = 2\sqrt{6}$$

$$\mathbf{3-5} \quad (-10\sqrt{20}) \div 2\sqrt{5} = -\frac{10\sqrt{20}}{2\sqrt{5}} = -\frac{10}{2} \sqrt{\frac{20}{5}} \\ = -5\sqrt{4} = -10$$

$$\mathbf{3-6} \quad 6\sqrt{28} \div (-2\sqrt{7}) = -\frac{6\sqrt{28}}{2\sqrt{7}} = -\frac{6}{2} \sqrt{\frac{28}{7}} = -3\sqrt{4} = -6$$

$$\mathbf{3-7} \quad \sqrt{10} \div \frac{\sqrt{5}}{\sqrt{14}} = \sqrt{10} \div \frac{5}{14} = \sqrt{10 \times \frac{14}{5}} = \sqrt{28} = 2\sqrt{7}$$

$$\mathbf{3-8} \quad \frac{\sqrt{21}}{\sqrt{5}} \div \frac{\sqrt{3}}{\sqrt{10}} = \sqrt{\frac{21}{5} \div \frac{3}{10}} = \sqrt{\frac{21}{5} \times \frac{10}{3}} = \sqrt{14}$$

$$\mathbf{3-9} \quad \sqrt{98} \div (-7\sqrt{2}) = -\frac{\sqrt{98}}{7\sqrt{2}} = -\frac{1}{7} \sqrt{\frac{98}{2}} = -\frac{1}{7} \sqrt{49} \\ = -\frac{1}{7} \times 7 = -1$$

$$\mathbf{3-10} \quad 7\sqrt{108} \div 6\sqrt{3} = \frac{7\sqrt{108}}{6\sqrt{3}} = \frac{7}{6} \sqrt{\frac{108}{3}} = \frac{7}{6} \sqrt{36} \\ = \frac{7}{6} \times 6 = 7$$

STEP 1

12 분모의 유리화 (1)

p. 66 ~ p. 67

1-1	2, 2, 2, 2	1-2	$\frac{\sqrt{3}}{3}$	1-3	$\frac{\sqrt{5}}{5}$
2-1	$\frac{\sqrt{6}}{6}$	2-2	$\frac{\sqrt{7}}{7}$	2-3	$\frac{\sqrt{10}}{10}$
3-1	2, 2, 2, 2	3-2	$\frac{6\sqrt{5}}{5}$	3-3	$\frac{2\sqrt{7}}{7}$
4-1	$\sqrt{5}$	4-2	$\frac{\sqrt{6}}{3}$	4-3	$\frac{\sqrt{15}}{5}$
5-1	5, 10, 5	5-2	$\frac{\sqrt{15}}{5}$	5-3	$\frac{\sqrt{35}}{7}$
6-1	$\frac{\sqrt{30}}{10}$	6-2	$\frac{\sqrt{65}}{13}$	6-3	$\frac{\sqrt{105}}{15}$
7-1	$\frac{\sqrt{21}}{7}$	7-2	$\frac{\sqrt{22}}{11}$	7-3	$\frac{\sqrt{70}}{14}$
8-1	2, $\frac{3\sqrt{2}}{4}$	8-2	$\frac{\sqrt{3}}{15}$	8-3	$\frac{2\sqrt{5}}{3}$
9-1	$\frac{\sqrt{30}}{24}$	9-2	$\frac{\sqrt{33}}{88}$	9-3	$\frac{3\sqrt{10}}{10}$

$$\mathbf{1-2} \quad \frac{1}{\sqrt{3}} = \frac{1 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\mathbf{1-3} \quad \frac{1}{\sqrt{5}} = \frac{1 \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{5}}{5}$$

$$\mathbf{2-1} \quad \frac{1}{\sqrt{6}} = \frac{1 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{6}}{6}$$

$$\mathbf{2-2} \quad \frac{1}{\sqrt{7}} = \frac{1 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{7}}{7}$$

$$\mathbf{2-3} \quad \frac{1}{\sqrt{10}} = \frac{1 \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{\sqrt{10}}{10}$$

$$\mathbf{3-2} \quad \frac{6}{\sqrt{5}} = \frac{6 \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{6\sqrt{5}}{5}$$

$$\mathbf{3-3} \quad \frac{2}{\sqrt{7}} = \frac{2 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{2\sqrt{7}}{7}$$

$$\mathbf{4-1} \quad \frac{5}{\sqrt{5}} = \frac{5 \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{5\sqrt{5}}{5} = \sqrt{5}$$

$$\mathbf{4-2} \quad \frac{2}{\sqrt{6}} = \frac{2 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{2\sqrt{6}}{6} = \frac{\sqrt{6}}{3}$$

$$\mathbf{4-3} \quad \frac{3}{\sqrt{15}} = \frac{3\sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{3\sqrt{15}}{15} = \frac{\sqrt{15}}{5}$$

$$\mathbf{5-2} \quad \frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{3} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{15}}{5}$$

$$5-3 \quad \frac{\sqrt{5}}{\sqrt{7}} = \frac{\sqrt{5} \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{35}}{7}$$

$$6-1 \quad \frac{\sqrt{3}}{\sqrt{10}} = \frac{\sqrt{3} \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{\sqrt{30}}{10}$$

$$6-2 \quad \frac{\sqrt{5}}{\sqrt{13}} = \frac{\sqrt{5} \times \sqrt{13}}{\sqrt{13} \times \sqrt{13}} = \frac{\sqrt{65}}{13}$$

$$6-3 \quad \frac{\sqrt{7}}{\sqrt{15}} = \frac{\sqrt{7} \times \sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{\sqrt{105}}{15}$$

$$7-1 \quad \sqrt{\frac{3}{7}} = \frac{\sqrt{3}}{\sqrt{7}} = \frac{\sqrt{3} \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{21}}{7}$$

$$7-2 \quad \sqrt{\frac{2}{11}} = \frac{\sqrt{2}}{\sqrt{11}} = \frac{\sqrt{2} \times \sqrt{11}}{\sqrt{11} \times \sqrt{11}} = \frac{\sqrt{22}}{11}$$

$$7-3 \quad \sqrt{\frac{5}{14}} = \frac{\sqrt{5}}{\sqrt{14}} = \frac{\sqrt{5} \times \sqrt{14}}{\sqrt{14} \times \sqrt{14}} = \frac{\sqrt{70}}{14}$$

$$8-2 \quad \frac{1}{5\sqrt{3}} = \frac{\sqrt{3}}{5\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{3}}{15}$$

$$8-3 \quad \frac{10}{3\sqrt{5}} = \frac{10 \times \sqrt{5}}{3\sqrt{5} \times \sqrt{5}} = \frac{10\sqrt{5}}{15} = \frac{2\sqrt{5}}{3}$$

$$9-1 \quad \frac{\sqrt{5}}{4\sqrt{6}} = \frac{\sqrt{5} \times \sqrt{6}}{4\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{30}}{24}$$

$$9-2 \quad \frac{\sqrt{3}}{8\sqrt{11}} = \frac{\sqrt{3} \times \sqrt{11}}{8\sqrt{11} \times \sqrt{11}} = \frac{\sqrt{33}}{88}$$

$$9-3 \quad \frac{3\sqrt{2}}{2\sqrt{5}} = \frac{3\sqrt{2} \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{3\sqrt{10}}{10}$$

13 분모의 유리화 (2)

p. 68

$$1-1 \quad 2, 2, \frac{\sqrt{2}}{2}$$

$$1-2 \quad \frac{3\sqrt{2}}{2}$$

$$1-3 \quad \frac{\sqrt{5}}{5}$$

$$2-1 \quad \frac{5\sqrt{3}}{9}$$

$$2-2 \quad \frac{3\sqrt{2}}{8}$$

$$2-3 \quad \frac{2\sqrt{5}}{3}$$

$$3-1 \quad 2, 3, 6, \frac{\sqrt{30}}{12}$$

$$3-2 \quad \frac{\sqrt{21}}{14}$$

$$3-3 \quad \frac{\sqrt{14}}{10}$$

$$4-1 \quad \frac{\sqrt{21}}{3}$$

$$4-2 \quad \frac{\sqrt{30}}{3}$$

$$4-3 \quad \frac{\sqrt{30}}{10}$$

$$1-2 \quad \frac{9}{\sqrt{18}} = \frac{9}{3\sqrt{2}} = \frac{3}{\sqrt{2}} = \frac{3 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{3\sqrt{2}}{2}$$

$$1-3 \quad \frac{2}{\sqrt{20}} = \frac{2}{2\sqrt{5}} = \frac{2 \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{5}}{5}$$

$$2-1 \quad \frac{5}{\sqrt{27}} = \frac{5}{3\sqrt{3}} = \frac{5 \times \sqrt{3}}{3\sqrt{3} \times \sqrt{3}} = \frac{5\sqrt{3}}{9}$$

$$2-2 \quad \frac{3}{\sqrt{32}} = \frac{3}{4\sqrt{2}} = \frac{3 \times \sqrt{2}}{4\sqrt{2} \times \sqrt{2}} = \frac{3\sqrt{2}}{8}$$

$$2-3 \quad \frac{10}{\sqrt{45}} = \frac{10}{3\sqrt{5}} = \frac{10 \times \sqrt{5}}{3\sqrt{5} \times \sqrt{5}} = \frac{10\sqrt{5}}{15} = \frac{2\sqrt{5}}{3}$$

$$3-2 \quad \frac{\sqrt{3}}{\sqrt{28}} = \frac{\sqrt{3}}{2\sqrt{7}} = \frac{\sqrt{3} \times \sqrt{7}}{2\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{21}}{14}$$

$$3-3 \quad \frac{\sqrt{7}}{\sqrt{50}} = \frac{\sqrt{7}}{5\sqrt{2}} = \frac{\sqrt{7} \times \sqrt{2}}{5\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{14}}{10}$$

$$4-1 \quad \frac{4\sqrt{7}}{\sqrt{48}} = \frac{4\sqrt{7}}{4\sqrt{3}} = \frac{\sqrt{7}}{\sqrt{3}} = \frac{\sqrt{7} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{21}}{3}$$

$$4-2 \quad \frac{6\sqrt{5}}{\sqrt{54}} = \frac{6\sqrt{5}}{3\sqrt{6}} = \frac{2\sqrt{5}}{\sqrt{6}} = \frac{2\sqrt{5} \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{2\sqrt{30}}{6} = \frac{\sqrt{30}}{3}$$

$$4-3 \quad \frac{3\sqrt{3}}{\sqrt{90}} = \frac{3\sqrt{3}}{3\sqrt{10}} = \frac{\sqrt{3}}{\sqrt{10}} = \frac{\sqrt{3} \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{\sqrt{30}}{10}$$

14 제곱근의 곱셈과 나눗셈

p. 69

$$1-1 \quad \sqrt{5}, \frac{\sqrt{10}}{5}$$

$$1-2 \quad \frac{2\sqrt{3}}{3}$$

$$2-1 \quad \frac{2\sqrt{6}}{3}$$

$$2-2 \quad \frac{24\sqrt{10}}{5}$$

$$3-1 \quad 2, \sqrt{2}$$

$$3-2 \quad \frac{\sqrt{6}}{3}$$

$$4-1 \quad \frac{2\sqrt{10}}{5}$$

$$4-2 \quad \frac{\sqrt{10}}{40}$$

$$1-2 \quad \sqrt{\frac{1}{6}} \times \sqrt{8} = \sqrt{\frac{1}{6} \times 8} = \sqrt{\frac{4}{3}} = \frac{2}{\sqrt{3}} = \frac{2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$2-1 \quad 6\sqrt{\frac{1}{3}} \times \frac{2}{3}\sqrt{\frac{1}{2}} = \left(6 \times \frac{2}{3}\right) \times \sqrt{\frac{1}{3} \times \frac{1}{2}} = \frac{4}{\sqrt{6}} \\ = \frac{4 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{4\sqrt{6}}{6} = \frac{2\sqrt{6}}{3}$$

$$\begin{aligned}
 \text{2-2 } 4\sqrt{12} \times 3\sqrt{\frac{2}{15}} &= (4 \times 3) \times \sqrt{12 \times \frac{2}{15}} \\
 &= \frac{12\sqrt{8}}{\sqrt{5}} = \frac{12 \times 2\sqrt{2}}{\sqrt{5}} \\
 &= \frac{24\sqrt{2}}{\sqrt{5}} = \frac{24\sqrt{2} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} \\
 &= \frac{24\sqrt{10}}{5}
 \end{aligned}$$

$$\text{3-2 } 2\sqrt{3} \div 3\sqrt{2} = \frac{2\sqrt{3}}{3\sqrt{2}} = \frac{2\sqrt{3} \times \sqrt{2}}{3\sqrt{2} \times \sqrt{2}} = \frac{2\sqrt{6}}{6} = \frac{\sqrt{6}}{3}$$

$$\text{4-1 } \sqrt{3} \div \frac{\sqrt{15}}{8} = \sqrt{3} \times \frac{2\sqrt{2}}{\sqrt{15}} = \frac{2\sqrt{2}}{\sqrt{5}} = \frac{2\sqrt{2} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{2\sqrt{10}}{5}$$

$$\text{4-2 } \frac{\sqrt{6}}{4\sqrt{5}} \div 2\sqrt{3} = \frac{\sqrt{6}}{4\sqrt{5}} \times \frac{1}{2\sqrt{3}} = \frac{\sqrt{2}}{8\sqrt{5}} = \frac{\sqrt{2} \times \sqrt{5}}{8\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{10}}{40}$$

15 제곱근의 곱셈과 나눗셈의 혼합 계산

p. 70 ~ p. 71

1-1 $\sqrt{14}$	1-2 2
2-1 10	2-2 $\sqrt{14}$
3-1 6, 6, 21, 3	3-2 2
4-1 $6\sqrt{10}$	4-2 $\frac{\sqrt{42}}{2}$
5-1 $3, 2\sqrt{3}$	5-2 $\frac{\sqrt{5}}{5}$
6-1 $\frac{3}{5}$	6-2 $\sqrt{3}$
7-1 $\frac{\sqrt{6}}{12}$	7-2 $\frac{5\sqrt{2}}{3}$
8-1 $2\sqrt{2}$	8-2 $\frac{\sqrt{21}}{7}$
9-1 3	9-2 $3\sqrt{5}$
10-1 24	10-2 $3\sqrt{10}$

$$\text{1-2 } \sqrt{2} \div \sqrt{3} \times \sqrt{6} = \sqrt{2} \times \frac{1}{\sqrt{3}} \times \sqrt{6} = \sqrt{2 \times \frac{1}{3} \times 6} = 2$$

$$\begin{aligned}
 \text{2-1 } 5\sqrt{2} \times \sqrt{10} \div \sqrt{5} &= 5\sqrt{2} \times \sqrt{10} \times \frac{1}{\sqrt{5}} \\
 &= 5 \times \sqrt{2 \times 10 \times \frac{1}{5}} \\
 &= 5 \times 2 = 10
 \end{aligned}$$

$$\begin{aligned}
 \text{2-2 } 2\sqrt{5} \div \sqrt{10} \times \sqrt{7} &= 2\sqrt{5} \times \frac{1}{\sqrt{10}} \times \sqrt{7} \\
 &= 2 \times \sqrt{5 \times \frac{1}{10} \times 7} \\
 &= \frac{2\sqrt{7}}{\sqrt{2}} = \frac{2\sqrt{7} \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \sqrt{14}
 \end{aligned}$$

$$\begin{aligned}
 \text{3-2 } \sqrt{56} \div 2\sqrt{7} \times \sqrt{2} &= 2\sqrt{14} \times \frac{1}{2\sqrt{7}} \times \sqrt{2} \\
 &= \left(2 \times \frac{1}{2}\right) \times \sqrt{14 \times \frac{1}{7} \times 2} = 2
 \end{aligned}$$

$$\begin{aligned}
 \text{4-1 } \sqrt{27} \div \sqrt{6} \times 4\sqrt{5} &= 3\sqrt{3} \times \frac{1}{\sqrt{6}} \times 4\sqrt{5} \\
 &= (3 \times 4) \times \sqrt{3 \times \frac{1}{6} \times 5} \\
 &= \frac{12\sqrt{5}}{\sqrt{2}} = \frac{12\sqrt{5} \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = 6\sqrt{10}
 \end{aligned}$$

$$\begin{aligned}
 \text{4-2 } \sqrt{63} \times \sqrt{3} \div 3\sqrt{2} &= 3\sqrt{7} \times \sqrt{3} \times \frac{1}{3\sqrt{2}} \\
 &= \left(3 \times \frac{1}{3}\right) \times \sqrt{7 \times 3 \times \frac{1}{2}} \\
 &= \frac{\sqrt{21}}{\sqrt{2}} = \frac{\sqrt{21} \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{42}}{2}
 \end{aligned}$$

$$\begin{aligned}
 \text{5-2 } \frac{3}{\sqrt{5}} \times \frac{\sqrt{2}}{\sqrt{3}} \div \sqrt{6} &= \frac{3}{\sqrt{5}} \times \frac{\sqrt{2}}{\sqrt{3}} \times \frac{1}{\sqrt{6}} \\
 &= \frac{3}{3\sqrt{5}} = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{5}}{5}
 \end{aligned}$$

$$\begin{aligned}
 \text{6-1 } \frac{3}{\sqrt{10}} \times \sqrt{12} \div \sqrt{30} &= \frac{3}{\sqrt{10}} \times 2\sqrt{3} \times \frac{1}{\sqrt{30}} \\
 &= \frac{6}{10} = \frac{3}{5}
 \end{aligned}$$

$$\begin{aligned}
 \text{6-2 } \frac{\sqrt{6}}{\sqrt{5}} \times \frac{2}{\sqrt{3}} \div \frac{\sqrt{8}}{\sqrt{15}} &= \frac{\sqrt{6}^3}{\sqrt{5}} \times \frac{2}{\sqrt{3}} \times \frac{\sqrt{15}}{2\sqrt{2}} \\
 &= \sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 \text{7-1 } \sqrt{15} \div 3\sqrt{5} \times \frac{1}{2\sqrt{2}} &= \frac{\sqrt{15}}{3\sqrt{5}} \times \frac{1}{2\sqrt{2}} \\
 &= \frac{\sqrt{3}}{6\sqrt{2}} = \frac{\sqrt{3} \times \sqrt{2}}{6\sqrt{2} \times \sqrt{2}} \\
 &= \frac{\sqrt{6}}{12}
 \end{aligned}$$

$$\begin{aligned}
 \text{7-2 } \frac{\sqrt{2}}{3} \times \frac{\sqrt{10}}{\sqrt{3}} \div \frac{\sqrt{2}}{\sqrt{15}} &= \frac{\sqrt{2}}{3} \times \frac{\sqrt{10}}{\sqrt{3}} \times \frac{\sqrt{15}}{\sqrt{2}} \\
 &= \frac{\sqrt{50}}{3} = \frac{5\sqrt{2}}{3}
 \end{aligned}$$

$$\begin{aligned}
 \text{8-1 } \frac{2}{\sqrt{3}} \times \frac{\sqrt{18}}{\sqrt{7}} \div \frac{\sqrt{6}}{\sqrt{14}} &= \frac{2}{\sqrt{3}} \times \frac{3\sqrt{2}}{\sqrt{7}} \times \frac{\sqrt{14}}{\sqrt{6}} \\
 &= \frac{6\sqrt{2}}{3} = 2\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 \text{8-2 } \frac{\sqrt{3}}{\sqrt{5}} \div \frac{\sqrt{2}}{\sqrt{3}} \times \frac{\sqrt{10}}{\sqrt{21}} &= \frac{\sqrt{3}}{\sqrt{5}} \times \frac{\sqrt{3}}{\sqrt{2}} \times \frac{\sqrt{10}}{\sqrt{21}} \\
 &= \frac{\sqrt{3}}{\sqrt{7}} = \frac{\sqrt{3} \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{21}}{7}
 \end{aligned}$$

$$9-1 \quad \sqrt{28} \div \frac{\sqrt{7}}{\sqrt{3}} \times \frac{\sqrt{3}}{2} = \frac{2\sqrt{7}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{7}} \times \frac{\sqrt{3}}{2} = 3$$

$$9-2 \quad \frac{3}{\sqrt{2}} \times \frac{5}{\sqrt{3}} \div \frac{\sqrt{5}}{\sqrt{6}} = \frac{3}{\sqrt{2}} \times \frac{5}{\sqrt{3}} \times \frac{\sqrt{6}}{\sqrt{5}} \\ = \frac{15}{\sqrt{5}} = \frac{15 \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} \\ = \frac{15\sqrt{5}}{5} = 3\sqrt{5}$$

$$10-1 \quad 3\sqrt{2} \times 2\sqrt{6} \div \frac{\sqrt{3}}{2} = 3\sqrt{2} \times 2\sqrt{6} \times \frac{2}{\sqrt{3}} = 24$$

$$10-2 \quad \frac{\sqrt{15}}{\sqrt{8}} \div \frac{\sqrt{5}}{2\sqrt{2}} \times \sqrt{30} = \frac{\sqrt{15}^3}{2\sqrt{2}} \times \frac{2\sqrt{2}}{\sqrt{5}} \times \sqrt{30} \\ = \sqrt{90} = 3\sqrt{10}$$

STEP 2

기본연산 집중연습 | 12~15

p. 72 ~ p. 73

$$1-1 \quad \frac{\sqrt{13}}{13}$$

$$1-2 \quad -\frac{\sqrt{21}}{7}$$

$$1-3 \quad \frac{3\sqrt{5}}{5}$$

$$1-4 \quad -\frac{\sqrt{21}}{7}$$

$$1-5 \quad \frac{\sqrt{10}}{5}$$

$$1-6 \quad \frac{\sqrt{91}}{13}$$

$$1-7 \quad \frac{3\sqrt{3}}{5}$$

$$1-8 \quad -\frac{2\sqrt{2}}{5}$$

$$1-9 \quad \frac{2\sqrt{6}}{3}$$

$$1-10 \quad \frac{\sqrt{5}}{4}$$

$$1-11 \quad \frac{\sqrt{10}}{5}$$

$$1-12 \quad \frac{\sqrt{6}}{3}$$

$$2-1 \quad \sqrt{2}$$

$$2-2 \quad \frac{3\sqrt{10}}{2}$$

$$2-3 \quad 5\sqrt{2}$$

$$2-4 \quad 2\sqrt{5}$$

$$2-5 \quad \frac{4\sqrt{10}}{5}$$

$$2-6 \quad 3$$

$$1-7 \quad \frac{9}{5\sqrt{3}} = \frac{9 \times \sqrt{3}}{5\sqrt{3} \times \sqrt{3}} = \frac{9\sqrt{3}}{15} = \frac{3\sqrt{3}}{5}$$

$$1-8 \quad -\frac{4}{5\sqrt{2}} = -\frac{4 \times \sqrt{2}}{5\sqrt{2} \times \sqrt{2}} = -\frac{4\sqrt{2}}{10} = -\frac{2\sqrt{2}}{5}$$

$$1-9 \quad \frac{12}{\sqrt{54}} = \frac{12}{3\sqrt{6}} = \frac{4}{\sqrt{6}} = \frac{4 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{4\sqrt{6}}{6} = \frac{2\sqrt{6}}{3}$$

$$1-10 \quad \frac{5}{\sqrt{80}} = \frac{5}{4\sqrt{5}} = \frac{5 \times \sqrt{5}}{4\sqrt{5} \times \sqrt{5}} = \frac{5\sqrt{5}}{20} = \frac{\sqrt{5}}{4}$$

$$1-11 \quad \frac{\sqrt{6}^2}{\sqrt{3} \times \sqrt{5}} = \frac{\sqrt{2}}{\sqrt{5}} = \frac{\sqrt{2} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{10}}{5}$$

$$1-12 \quad \frac{\sqrt{14}^2}{\sqrt{3} \times \sqrt{7}} = \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{2} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{6}}{3}$$

$$2-1 \quad \sqrt{5} \div \sqrt{20} \times \sqrt{8} = \frac{\sqrt{5}}{2\sqrt{5}} \times \sqrt{2} = \sqrt{2}$$

$$2-2 \quad \sqrt{15} \times \sqrt{18} \div \sqrt{12} = \sqrt{15}^3 \times 3\sqrt{2} \times \frac{1}{2\sqrt{3}} = \frac{3\sqrt{10}}{2}$$

$$2-3 \quad \sqrt{75} \div \sqrt{21} \times \sqrt{14} = 5\sqrt{3} \times \frac{1}{\sqrt{21}} \times \sqrt{14} = 5\sqrt{2}$$

$$2-4 \quad \frac{\sqrt{6}}{\sqrt{5}} \div \sqrt{2} \times \frac{10}{\sqrt{3}} = \frac{\sqrt{6}}{\sqrt{5}} \times \frac{1}{\sqrt{2}} \times \frac{10}{\sqrt{3}} = \frac{10}{\sqrt{5}} = 2\sqrt{5}$$

$$2-5 \quad \frac{\sqrt{3}}{\sqrt{2}} \div \frac{\sqrt{5}}{\sqrt{6}} \times \frac{8}{\sqrt{18}} = \frac{\sqrt{3}}{\sqrt{2}} \times \frac{\sqrt{6}^3}{\sqrt{5}} \times \frac{8}{3\sqrt{2}} \\ = \frac{8}{\sqrt{10}} = \frac{8\sqrt{10}}{10} = \frac{4\sqrt{10}}{5}$$

$$2-6 \quad \frac{3\sqrt{3}}{\sqrt{2}} \times \frac{\sqrt{12}}{\sqrt{15}} \div \frac{\sqrt{6}}{\sqrt{5}} = \frac{3\sqrt{3}}{\sqrt{2}} \times \frac{2\sqrt{3}}{\sqrt{15}} \times \frac{\sqrt{5}}{\sqrt{6}^2} = 3$$

STEP 1

16 제곱근의 덧셈과 뺄셈 (1)

p. 74 ~ p. 75

$$1-1 \quad 3, 10\sqrt{2}$$

$$1-2 \quad 5\sqrt{5}$$

$$2-1 \quad 3\sqrt{3}$$

$$2-2 \quad 6\sqrt{2}$$

$$3-1 \quad 9\sqrt{7}$$

$$3-2 \quad 5\sqrt{6}$$

$$4-1 \quad 3, -\sqrt{2}$$

$$4-2 \quad -4\sqrt{3}$$

$$5-1 \quad 5\sqrt{5}$$

$$5-2 \quad -5\sqrt{10}$$

$$6-1 \quad 3, \sqrt{2}$$

$$6-2 \quad \sqrt{2}$$

$$7-1 \quad \frac{\sqrt{5}}{4}$$

$$7-2 \quad \frac{2\sqrt{7}}{3}$$

$$8-1 \quad \frac{9\sqrt{5}}{5}$$

$$8-2 \quad -\frac{\sqrt{3}}{12}$$

$$9-1 \quad \sqrt{2}, 3\sqrt{2}$$

$$9-2 \quad 2\sqrt{3}$$

$$10-1 \quad -3\sqrt{7}$$

$$10-2 \quad -6\sqrt{5}$$

$$11-1 \quad \frac{\sqrt{3}}{4}$$

$$11-2 \quad \frac{25\sqrt{2}}{12}$$

$$1-2 \quad 3\sqrt{5}+2\sqrt{5}=(3+2)\sqrt{5}=5\sqrt{5}$$

$$2-1 \quad \sqrt{3}+2\sqrt{3}=(1+2)\sqrt{3}=3\sqrt{3}$$

$$2-2 \quad 5\sqrt{2}+\sqrt{2}=(5+1)\sqrt{2}=6\sqrt{2}$$

$$3-1 \quad 4\sqrt{7}+5\sqrt{7}=(4+5)\sqrt{7}=9\sqrt{7}$$

$$3-2 \quad 2\sqrt{6}+3\sqrt{6}=(2+3)\sqrt{6}=5\sqrt{6}$$

$$4-2 \quad \sqrt{3}-5\sqrt{3}=(1-5)\sqrt{3}=-4\sqrt{3}$$

$$5-1 \quad 7\sqrt{5}-2\sqrt{5}=(7-2)\sqrt{5}=5\sqrt{5}$$

$$5-2 \quad -2\sqrt{10}-3\sqrt{10}=(-2-3)\sqrt{10}=-5\sqrt{10}$$

$$6-2 \quad \frac{3\sqrt{2}}{2}-\frac{\sqrt{2}}{2}=\frac{2\sqrt{2}}{2}=\sqrt{2}$$

$$7-1 \quad \frac{\sqrt{5}}{2}-\frac{\sqrt{5}}{4}=\frac{2\sqrt{5}}{4}-\frac{\sqrt{5}}{4}=\frac{\sqrt{5}}{4}$$

$$7-2 \quad \sqrt{7}-\frac{\sqrt{7}}{3}=\frac{3\sqrt{7}}{3}-\frac{\sqrt{7}}{3}=\frac{2\sqrt{7}}{3}$$

$$8-1 \quad \sqrt{5}+\frac{4\sqrt{5}}{5}=\frac{5\sqrt{5}}{5}+\frac{4\sqrt{5}}{5}=\frac{9\sqrt{5}}{5}$$

$$8-2 \quad \frac{2\sqrt{3}}{3}-\frac{3\sqrt{3}}{4}=\frac{8\sqrt{3}}{12}-\frac{9\sqrt{3}}{12}=-\frac{\sqrt{3}}{12}$$

$$9-2 \quad -2\sqrt{3}+7\sqrt{3}-3\sqrt{3}=(-2+7-3)\sqrt{3}=2\sqrt{3}$$

$$10-1 \quad 4\sqrt{7}-6\sqrt{7}-\sqrt{7}=(4-6-1)\sqrt{7}=-3\sqrt{7}$$

$$10-2 \quad -\sqrt{5}-2\sqrt{5}-3\sqrt{5}=(-1-2-3)\sqrt{5}=-6\sqrt{5}$$

$$11-1 \quad \frac{3\sqrt{3}}{4}-\frac{3\sqrt{3}}{2}+\sqrt{3}=\frac{3\sqrt{3}}{4}-\frac{6\sqrt{3}}{4}+\frac{4\sqrt{3}}{4}=\frac{\sqrt{3}}{4}$$

$$11-2 \quad \frac{\sqrt{2}}{3}-\frac{\sqrt{2}}{4}+2\sqrt{2}=\frac{4\sqrt{2}}{12}-\frac{3\sqrt{2}}{12}+\frac{24\sqrt{2}}{12}=\frac{25\sqrt{2}}{12}$$

17 제곱근의 덧셈과 뺄셈 (2)

p. 76

$$1-1 \quad 2, 3, 5\sqrt{5}$$

$$1-2 \quad 6\sqrt{2}$$

$$2-1 \quad \sqrt{13}$$

$$2-2 \quad -\sqrt{3}$$

$$3-1 \quad -\sqrt{3}$$

$$3-2 \quad \sqrt{7}$$

$$4-1 \quad -2\sqrt{6}$$

$$4-2 \quad \sqrt{10}$$

$$5-1 \quad -6\sqrt{2}$$

$$5-2 \quad 3\sqrt{5}$$

$$1-2 \quad \sqrt{8}+\sqrt{32}=2\sqrt{2}+4\sqrt{2}=6\sqrt{2}$$

$$2-1 \quad \sqrt{52}-\sqrt{13}=2\sqrt{13}-\sqrt{13}=\sqrt{13}$$

$$2-2 \quad \sqrt{12}-\sqrt{27}=2\sqrt{3}-3\sqrt{3}=-\sqrt{3}$$

$$3-1 \quad 2\sqrt{12}-\sqrt{75}=2 \times 2\sqrt{3}-5\sqrt{3}=4\sqrt{3}-5\sqrt{3}=-\sqrt{3}$$

$$3-2 \quad -\sqrt{63}+2\sqrt{28}=-3\sqrt{7}+2 \times 2\sqrt{7}=-3\sqrt{7}+4\sqrt{7}=\sqrt{7}$$

$$4-1 \quad \sqrt{24}-\sqrt{6}-\sqrt{54}=2\sqrt{6}-\sqrt{6}-3\sqrt{6}=-2\sqrt{6}$$

$$4-2 \quad \sqrt{40}-\sqrt{90}+2\sqrt{10}=2\sqrt{10}-3\sqrt{10}+2\sqrt{10}=\sqrt{10}$$

$$5-1 \quad \sqrt{18}-\sqrt{32}-\sqrt{50}=3\sqrt{2}-4\sqrt{2}-5\sqrt{2}=-6\sqrt{2}$$

$$5-2 \quad \sqrt{125}-\sqrt{80}+\sqrt{20}=5\sqrt{5}-4\sqrt{5}+2\sqrt{5}=3\sqrt{5}$$

18 제곱근의 덧셈과 뺄셈 (3)

p. 77

$$1-1 \quad 6, 2$$

$$1-2 \quad -2\sqrt{6}+\sqrt{5}$$

$$2-1 \quad -2\sqrt{2}+2\sqrt{5}$$

$$2-2 \quad 4\sqrt{10}-9\sqrt{6}$$

$$3-1 \quad 2\sqrt{3}-\sqrt{2}$$

$$3-2 \quad 2\sqrt{2}+4\sqrt{3}$$

$$4-1 \quad 2\sqrt{3}-2\sqrt{2}$$

$$4-2 \quad 10\sqrt{3}-15\sqrt{5}$$

$$1-2 \quad 2\sqrt{6}+\sqrt{5}-4\sqrt{6}=2\sqrt{6}-4\sqrt{6}+\sqrt{5}=-2\sqrt{6}+\sqrt{5}$$

$$2-1 \quad 2\sqrt{2}+3\sqrt{5}-4\sqrt{2}-\sqrt{5}=2\sqrt{2}-4\sqrt{2}+3\sqrt{5}-\sqrt{5}=-2\sqrt{2}+2\sqrt{5}$$

$$2-2 \quad 6\sqrt{10}-10\sqrt{6}-2\sqrt{10}+\sqrt{6}=6\sqrt{10}-2\sqrt{10}-10\sqrt{6}+\sqrt{6}=4\sqrt{10}-9\sqrt{6}$$

$$3-1 \quad \sqrt{48}+4\sqrt{2}-\sqrt{50}-\sqrt{12}=4\sqrt{3}+4\sqrt{2}-5\sqrt{2}-2\sqrt{3}=4\sqrt{3}-2\sqrt{3}+4\sqrt{2}-5\sqrt{2}=2\sqrt{3}-\sqrt{2}$$

$$\begin{aligned} 3-2 \quad 3\sqrt{8} + \sqrt{18} - \sqrt{98} + \sqrt{48} &= 3 \times 2\sqrt{2} + 3\sqrt{2} - 7\sqrt{2} + 4\sqrt{3} \\ &= 6\sqrt{2} + 3\sqrt{2} - 7\sqrt{2} + 4\sqrt{3} \\ &= 2\sqrt{2} + 4\sqrt{3} \end{aligned}$$

$$\begin{aligned} 4-1 \quad -\sqrt{27} + \sqrt{75} - \sqrt{72} + \sqrt{32} &= -3\sqrt{3} + 5\sqrt{3} - 6\sqrt{2} + 4\sqrt{2} \\ &= 2\sqrt{3} - 2\sqrt{2} \end{aligned}$$

$$\begin{aligned} 4-2 \quad \sqrt{27} + \sqrt{147} - 5\sqrt{20} - \sqrt{125} &= 3\sqrt{3} + 7\sqrt{3} - 5 \times 2\sqrt{5} - 5\sqrt{5} \\ &= 3\sqrt{3} + 7\sqrt{3} - 10\sqrt{5} - 5\sqrt{5} \\ &= 10\sqrt{3} - 15\sqrt{5} \end{aligned}$$

19 분모의 유리화를 이용한 제곱근의 덧셈과 뺄셈 p. 78 ~ p. 79

$$1-1 \quad 2, \frac{9\sqrt{7}}{7}$$

$$2-1 \quad 6\sqrt{3}$$

$$3-1 \quad \frac{2\sqrt{5}}{5}$$

$$4-1 \quad \sqrt{2}$$

$$5-1 \quad \frac{5\sqrt{2}}{2}$$

$$6-1 \quad 3, 9, \sqrt{2}, 8\sqrt{2}$$

$$7-1 \quad \sqrt{3}$$

$$8-1 \quad \frac{5\sqrt{6}}{3}$$

$$9-1 \quad 2\sqrt{2} - \sqrt{3}$$

$$10-1 \quad -3\sqrt{10} - 2\sqrt{2}$$

$$1-2 \quad \frac{17\sqrt{5}}{15}$$

$$2-2 \quad 8\sqrt{5}$$

$$3-2 \quad -\frac{\sqrt{3}}{3}$$

$$4-2 \quad -\sqrt{5}$$

$$5-2 \quad \frac{4\sqrt{7}}{7}$$

$$6-2 \quad \frac{8\sqrt{5}}{5}$$

$$7-2 \quad -4\sqrt{3}$$

$$8-2 \quad \frac{\sqrt{3}}{3}$$

$$9-2 \quad \sqrt{2} - 4\sqrt{3}$$

$$10-2 \quad -3\sqrt{2} + 4\sqrt{5}$$

$$1-2 \quad \frac{\sqrt{5}}{3} + \frac{4}{\sqrt{5}} = \frac{\sqrt{5}}{3} + \frac{4\sqrt{5}}{5} = \frac{5\sqrt{5}}{15} + \frac{12\sqrt{5}}{15} = \frac{17\sqrt{5}}{15}$$

$$2-1 \quad 4\sqrt{3} + \frac{6}{\sqrt{3}} = 4\sqrt{3} + \frac{6\sqrt{3}}{3} = 4\sqrt{3} + 2\sqrt{3} = 6\sqrt{3}$$

$$2-2 \quad \frac{10}{\sqrt{5}} + 6\sqrt{5} = \frac{10\sqrt{5}}{5} + 6\sqrt{5} = 2\sqrt{5} + 6\sqrt{5} = 8\sqrt{5}$$

$$3-1 \quad \frac{3}{\sqrt{5}} - \frac{\sqrt{5}}{5} = \frac{3\sqrt{5}}{5} - \frac{\sqrt{5}}{5} = \frac{2\sqrt{5}}{5}$$

$$3-2 \quad \frac{1}{\sqrt{3}} - \frac{2\sqrt{3}}{3} = \frac{\sqrt{3}}{3} - \frac{2\sqrt{3}}{3} = -\frac{\sqrt{3}}{3}$$

$$4-1 \quad \frac{8}{\sqrt{2}} - \sqrt{18} = \frac{8\sqrt{2}}{2} - 3\sqrt{2} = 4\sqrt{2} - 3\sqrt{2} = \sqrt{2}$$

$$4-2 \quad \sqrt{20} - \frac{15}{\sqrt{5}} = 2\sqrt{5} - \frac{15\sqrt{5}}{5} = 2\sqrt{5} - 3\sqrt{5} = -\sqrt{5}$$

$$5-1 \quad \frac{3}{\sqrt{2}} + \frac{4}{\sqrt{8}} = \frac{3}{\sqrt{2}} + \frac{4}{2\sqrt{2}} = \frac{3\sqrt{2}}{2} + \frac{2\sqrt{2}}{2} = \frac{5\sqrt{2}}{2}$$

$$5-2 \quad \frac{6}{\sqrt{7}} - \frac{4}{\sqrt{28}} = \frac{6}{\sqrt{7}} - \frac{4}{2\sqrt{7}} = \frac{6\sqrt{7}}{7} - \frac{2\sqrt{7}}{7} = \frac{4\sqrt{7}}{7}$$

$$\begin{aligned} 6-2 \quad -2\sqrt{20} + 2\sqrt{45} - \frac{2}{\sqrt{5}} &= -2 \times 2\sqrt{5} + 2 \times 3\sqrt{5} - \frac{2\sqrt{5}}{5} \\ &= -4\sqrt{5} + 6\sqrt{5} - \frac{2\sqrt{5}}{5} \\ &= 2\sqrt{5} - \frac{2\sqrt{5}}{5} = \frac{8\sqrt{5}}{5} \end{aligned}$$

$$\begin{aligned} 7-1 \quad \sqrt{\frac{3}{4}} - \frac{3}{\sqrt{12}} + \sqrt{3} &= \frac{\sqrt{3}}{2} - \frac{3}{2\sqrt{3}} + \sqrt{3} \\ &= \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} + \sqrt{3} = \sqrt{3} \end{aligned}$$

$$7-2 \quad -\sqrt{27} - \frac{9}{\sqrt{3}} + \frac{6}{\sqrt{3}} = -3\sqrt{3} - 3\sqrt{3} + 2\sqrt{3} = -4\sqrt{3}$$

$$\begin{aligned} 8-1 \quad 2\sqrt{24} + \frac{4}{\sqrt{6}} - 3\sqrt{6} &= 2 \times 2\sqrt{6} + \frac{4\sqrt{6}}{6} - 3\sqrt{6} \\ &= 4\sqrt{6} + \frac{2\sqrt{6}}{3} - 3\sqrt{6} \\ &= \sqrt{6} + \frac{2\sqrt{6}}{3} = \frac{5\sqrt{6}}{3} \end{aligned}$$

$$\begin{aligned} 8-2 \quad \frac{5\sqrt{6}}{\sqrt{2}} - \frac{\sqrt{12}}{3} - \sqrt{48} &= 5\sqrt{3} - \frac{2\sqrt{3}}{3} - 4\sqrt{3} \\ &= \sqrt{3} - \frac{2\sqrt{3}}{3} = \frac{\sqrt{3}}{3} \end{aligned}$$

$$\begin{aligned} 9-1 \quad \frac{2\sqrt{3}}{\sqrt{6}} - 4\sqrt{3} + \frac{2}{\sqrt{2}} + \sqrt{27} &= \frac{2}{\sqrt{2}} - 4\sqrt{3} + \frac{2}{\sqrt{2}} + 3\sqrt{3} \\ &= \sqrt{2} - 4\sqrt{3} + \sqrt{2} + 3\sqrt{3} \\ &= 2\sqrt{2} - \sqrt{3} \end{aligned}$$

$$\begin{aligned} 9-2 \quad 5\sqrt{2} - \sqrt{75} + \frac{3}{\sqrt{3}} - 2\sqrt{8} &= 5\sqrt{2} - 5\sqrt{3} + \sqrt{3} - 4\sqrt{2} \\ &= \sqrt{2} - 4\sqrt{3} \end{aligned}$$

$$\begin{aligned} 10-1 \quad \sqrt{10} + \frac{2\sqrt{10}}{\sqrt{5}} - 2\sqrt{40} - \sqrt{32} &= \sqrt{10} + 2\sqrt{2} - 2 \times 2\sqrt{10} - 4\sqrt{2} \\ &= \sqrt{10} + 2\sqrt{2} - 4\sqrt{10} - 4\sqrt{2} \\ &= -3\sqrt{10} - 2\sqrt{2} \end{aligned}$$

$$\begin{aligned} 10-2 \quad \frac{\sqrt{72}}{2} - \frac{6\sqrt{24}}{\sqrt{3}} + 2\sqrt{18} + \frac{20}{\sqrt{5}} &= \frac{6\sqrt{2}}{2} - 6\sqrt{8} + 2 \times 3\sqrt{2} + \frac{20\sqrt{5}}{5} \\ &= 3\sqrt{2} - 6 \times 2\sqrt{2} + 6\sqrt{2} + 4\sqrt{5} \\ &= 3\sqrt{2} - 12\sqrt{2} + 6\sqrt{2} + 4\sqrt{5} \\ &= -3\sqrt{2} + 4\sqrt{5} \end{aligned}$$

20 근호가 있는 식의 분배법칙

p. 80 ~ p. 81

1-1	6, 15	1-2	$5\sqrt{2}+3\sqrt{6}$
2-1	$-\sqrt{6}-\sqrt{30}$	2-2	$-2\sqrt{30}-8\sqrt{3}$
3-1	$2\sqrt{21}-\sqrt{35}$	3-2	$\sqrt{35}-\sqrt{30}$
4-1	$-3\sqrt{2}+2\sqrt{10}$	4-2	$-12+6\sqrt{10}$
5-1	$5\sqrt{2}+10$	5-2	$2\sqrt{3}+3\sqrt{30}$
6-1	3, 3, 3, 6, 2	6-2	$-\sqrt{3}+2$
7-1	$2\sqrt{2}-\sqrt{5}$	7-2	$3\sqrt{7}-2\sqrt{10}$
8-1	$\sqrt{2}, \sqrt{2}, \frac{\sqrt{14}+\sqrt{10}}{2}$	8-2	$\frac{3\sqrt{5}+\sqrt{15}}{5}$
9-1	$\sqrt{3}-\frac{\sqrt{6}}{2}$	9-2	$\frac{\sqrt{2}}{2}-\frac{\sqrt{30}}{5}$
10-1	$\sqrt{2}+\frac{\sqrt{3}}{6}$	10-2	$\frac{\sqrt{6}}{6}-\frac{\sqrt{2}}{2}$

$$\begin{aligned} 2-2 \quad -2\sqrt{6}(\sqrt{5}+\sqrt{8}) &= -2\sqrt{30}-2\sqrt{48} \\ &= -2\sqrt{30}-2\times 4\sqrt{3} \\ &= -2\sqrt{30}-8\sqrt{3} \end{aligned}$$

$$\begin{aligned} 4-2 \quad -3\sqrt{2}(\sqrt{8}-\sqrt{20}) &= -3\sqrt{16}+3\sqrt{40} \\ &= -3\times 4+3\times 2\sqrt{10} \\ &= -12+6\sqrt{10} \end{aligned}$$

$$5-1 \quad (\sqrt{10}+\sqrt{20})\sqrt{5}=\sqrt{50}+\sqrt{100}=5\sqrt{2}+10$$

$$5-2 \quad (\sqrt{2}+3\sqrt{5})\sqrt{6}=\sqrt{12}+3\sqrt{30}=2\sqrt{3}+3\sqrt{30}$$

$$\begin{aligned} 6-2 \quad (\sqrt{15}-\sqrt{20})\div(-\sqrt{5}) &= -\frac{\sqrt{15}-\sqrt{20}}{\sqrt{5}} \\ &= -(\sqrt{3}-\sqrt{4}) \\ &= -\sqrt{3}+2 \end{aligned}$$

$$7-1 \quad (\sqrt{24}-\sqrt{15})\div\sqrt{3}=\frac{\sqrt{24}-\sqrt{15}}{\sqrt{3}}=\sqrt{8}-\sqrt{5}=2\sqrt{2}-\sqrt{5}$$

$$7-2 \quad (3\sqrt{21}-2\sqrt{30})\div\sqrt{3}=\frac{3\sqrt{21}-2\sqrt{30}}{\sqrt{3}}=3\sqrt{7}-2\sqrt{10}$$

$$8-2 \quad \frac{3+\sqrt{3}}{\sqrt{5}}=\frac{(3+\sqrt{3})\times\sqrt{5}}{\sqrt{5}\times\sqrt{5}}=\frac{3\sqrt{5}+\sqrt{15}}{5}$$

$$\begin{aligned} 9-1 \quad \frac{\sqrt{6}-\sqrt{3}}{\sqrt{2}} &= \frac{(\sqrt{6}-\sqrt{3})\times\sqrt{2}}{\sqrt{2}\times\sqrt{2}}=\frac{\sqrt{12}-\sqrt{6}}{2} \\ &= \frac{2\sqrt{3}-\sqrt{6}}{2}=\sqrt{3}-\frac{\sqrt{6}}{2} \end{aligned}$$

$$\begin{aligned} 9-2 \quad \frac{\sqrt{5}-2\sqrt{3}}{\sqrt{10}} &= \frac{(\sqrt{5}-2\sqrt{3})\times\sqrt{10}}{\sqrt{10}\times\sqrt{10}}=\frac{\sqrt{50}-2\sqrt{30}}{10} \\ &= \frac{5\sqrt{2}-2\sqrt{30}}{10}=\frac{\sqrt{2}}{2}-\frac{\sqrt{30}}{5} \end{aligned}$$

$$\begin{aligned} 10-1 \quad \frac{4\sqrt{3}+\sqrt{2}}{2\sqrt{6}} &= \frac{(4\sqrt{3}+\sqrt{2})\times\sqrt{6}}{2\sqrt{6}\times\sqrt{6}}=\frac{4\sqrt{18}+\sqrt{12}}{12} \\ &= \frac{12\sqrt{2}+2\sqrt{3}}{12}=\sqrt{2}+\frac{\sqrt{3}}{6} \end{aligned}$$

$$\begin{aligned} 10-2 \quad \frac{\sqrt{2}-\sqrt{6}}{2\sqrt{3}} &= \frac{(\sqrt{2}-\sqrt{6})\times\sqrt{3}}{2\sqrt{3}\times\sqrt{3}}=\frac{\sqrt{6}-\sqrt{18}}{6} \\ &= \frac{\sqrt{6}-3\sqrt{2}}{6}=\frac{\sqrt{6}}{6}-\frac{\sqrt{2}}{2} \end{aligned}$$

21 근호가 있는 복잡한 식의 계산

p. 82 ~ p. 83

1-1	2, 5	1-2	$\sqrt{6}$
2-1	$\sqrt{3}$	2-2	$4\sqrt{2}$
3-1	$4\sqrt{3}$	3-2	$7\sqrt{2}$
4-1	$6\sqrt{2}$	4-2	$15\sqrt{3}$
5-1	2, 3, 3	5-2	$3+\sqrt{5}$
6-1	$-2\sqrt{2}$	6-2	$-5\sqrt{3}$
7-1	$-5\sqrt{2}+5\sqrt{3}$	7-2	$6-2\sqrt{3}$
8-1	$3\sqrt{3}-\frac{7\sqrt{6}}{3}$	8-2	$5\sqrt{3}-4\sqrt{2}$
9-1	$5-5\sqrt{6}$	9-2	$5\sqrt{2}-9\sqrt{3}$

$$\begin{aligned} 1-2 \quad 2\sqrt{24}-\sqrt{18}\times\sqrt{3} &= 2\times 2\sqrt{6}-3\sqrt{2}\times\sqrt{3} \\ &= 4\sqrt{6}-3\sqrt{6}=\sqrt{6} \end{aligned}$$

$$\begin{aligned} 2-1 \quad \sqrt{15}\times\sqrt{5}-8\sqrt{6}\div 2\sqrt{2} &= \sqrt{75}-\frac{8\sqrt{6}}{2\sqrt{2}} \\ &= 5\sqrt{3}-4\sqrt{3}=\sqrt{3} \end{aligned}$$

$$\begin{aligned} 2-2 \quad \sqrt{12}\times\sqrt{6}-\sqrt{40}\div\sqrt{5} &= \sqrt{72}-\frac{\sqrt{40}}{\sqrt{5}}=6\sqrt{2}-\sqrt{8} \\ &= 6\sqrt{2}-2\sqrt{2}=4\sqrt{2} \end{aligned}$$

$$\begin{aligned} 3-1 \quad \sqrt{18}\div\frac{1}{\sqrt{6}}-\sqrt{12} &= \sqrt{18}\times\sqrt{6}-2\sqrt{3} \\ &= 6\sqrt{3}-2\sqrt{3}=4\sqrt{3} \end{aligned}$$

$$3-2 \quad \sqrt{18}-\frac{\sqrt{12}}{\sqrt{6}}+\sqrt{10}\times\sqrt{5}=3\sqrt{2}-\sqrt{2}+5\sqrt{2}=7\sqrt{2}$$

$$\begin{aligned} 4-1 \quad & \sqrt{72} + \frac{6}{\sqrt{2}} - \sqrt{3} \times \sqrt{6} = 6\sqrt{2} + \frac{6\sqrt{2}}{2} - \sqrt{18} \\ & = 6\sqrt{2} + 3\sqrt{2} - 3\sqrt{2} = 6\sqrt{2} \end{aligned}$$

$$\begin{aligned} 4-2 \quad & \frac{24}{\sqrt{3}} + 3\sqrt{24} \times \sqrt{2} - \sqrt{75} = \frac{24\sqrt{3}}{3} + 3\sqrt{48} - 5\sqrt{3} \\ & = 8\sqrt{3} + 12\sqrt{3} - 5\sqrt{3} = 15\sqrt{3} \end{aligned}$$

$$\begin{aligned} 5-2 \quad & \sqrt{3}(\sqrt{15} + \sqrt{3}) - \sqrt{20} = \sqrt{45} + 3 - \sqrt{20} \\ & = 3\sqrt{5} + 3 - 2\sqrt{5} \\ & = 3 + \sqrt{5} \end{aligned}$$

$$\begin{aligned} 6-1 \quad & \sqrt{2}(3 - \sqrt{5}) + \sqrt{5}(\sqrt{2} - \sqrt{10}) = 3\sqrt{2} - \sqrt{10} + \sqrt{10} - \sqrt{50} \\ & = 3\sqrt{2} - 5\sqrt{2} = -2\sqrt{2} \end{aligned}$$

$$\begin{aligned} 6-2 \quad & \sqrt{2}(3 - \sqrt{6}) - \sqrt{3}(3 + \sqrt{6}) = 3\sqrt{2} - \sqrt{12} - 3\sqrt{3} - \sqrt{18} \\ & = 3\sqrt{2} - 2\sqrt{3} - 3\sqrt{3} - 3\sqrt{2} \\ & = -5\sqrt{3} \end{aligned}$$

$$\begin{aligned} 7-1 \quad & \sqrt{6}\left(\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}}\right) + 2(\sqrt{12} - \sqrt{18}) \\ & = \sqrt{3} + \sqrt{2} + 2\sqrt{12} - 2\sqrt{18} \\ & = \sqrt{3} + \sqrt{2} + 2 \times 2\sqrt{3} - 2 \times 3\sqrt{2} \\ & = \sqrt{3} + \sqrt{2} + 4\sqrt{3} - 6\sqrt{2} \\ & = -5\sqrt{2} + 5\sqrt{3} \end{aligned}$$

$$\begin{aligned} 7-2 \quad & \frac{\sqrt{45} - \sqrt{15}}{\sqrt{5}} + \sqrt{3}(\sqrt{3} - 1) = \sqrt{9} - \sqrt{3} + 3 - \sqrt{3} \\ & = 3 - \sqrt{3} + 3 - \sqrt{3} \\ & = 6 - 2\sqrt{3} \end{aligned}$$

$$\begin{aligned} 8-1 \quad & \sqrt{3}(5 - 3\sqrt{2}) - \frac{6 - 2\sqrt{2}}{\sqrt{3}} \\ & = 5\sqrt{3} - 3\sqrt{6} - \frac{(6 - 2\sqrt{2}) \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ & = 5\sqrt{3} - 3\sqrt{6} - \frac{6\sqrt{3} - 2\sqrt{6}}{3} \\ & = 5\sqrt{3} - 3\sqrt{6} - 2\sqrt{3} + \frac{2\sqrt{6}}{3} \\ & = 3\sqrt{3} - \frac{7\sqrt{6}}{3} \end{aligned}$$

$$\begin{aligned} 8-2 \quad & \frac{3\sqrt{6} - 4}{\sqrt{2}} - \sqrt{2}(2 - \sqrt{6}) \\ & = \frac{(3\sqrt{6} - 4) \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} - 2\sqrt{2} + \sqrt{12} \\ & = \frac{3\sqrt{12} - 4\sqrt{2}}{2} - 2\sqrt{2} + 2\sqrt{3} \\ & = 3\sqrt{3} - 2\sqrt{2} - 2\sqrt{2} + 2\sqrt{3} \\ & = 5\sqrt{3} - 4\sqrt{2} \end{aligned}$$

$$\begin{aligned} 9-1 \quad & \sqrt{75}\left(\sqrt{3} - \frac{4}{\sqrt{2}}\right) - \frac{5}{\sqrt{3}}(\sqrt{12} - \sqrt{18}) \\ & = 5\sqrt{3}(\sqrt{3} - 2\sqrt{2}) - \frac{5\sqrt{3}}{3}(2\sqrt{3} - 3\sqrt{2}) \\ & = 15 - 10\sqrt{6} - 10 + 5\sqrt{6} \\ & = 5 - 5\sqrt{6} \end{aligned}$$

$$\begin{aligned} 9-2 \quad & \sqrt{24}\left(\sqrt{3} - \frac{5}{\sqrt{2}}\right) - (\sqrt{12} - \sqrt{18}) \div \sqrt{6} \\ & = 2\sqrt{6}\left(\sqrt{3} - \frac{5\sqrt{2}}{2}\right) - \frac{\sqrt{12} - \sqrt{18}}{\sqrt{6}} \\ & = 2\sqrt{18} - 5\sqrt{12} - \sqrt{2} + \sqrt{3} \\ & = 6\sqrt{2} - 10\sqrt{3} - \sqrt{2} + \sqrt{3} \\ & = 5\sqrt{2} - 9\sqrt{3} \end{aligned}$$

22 실수의 대소 관계

p. 84

$$1-1 \quad 75, 64, >, >$$

$$1-2 \quad >$$

$$2-1 \quad >$$

$$2-2 \quad >$$

$$3-1 \quad <$$

$$3-2 \quad <$$

$$4-1 \quad >$$

$$4-2 \quad <$$

$$\begin{aligned} 1-2 \quad & (1 + 4\sqrt{2}) - (3\sqrt{2} + 2) = 1 + 4\sqrt{2} - 3\sqrt{2} - 2 \\ & = \sqrt{2} - 1 = \sqrt{2} - \sqrt{1} > 0 \\ \therefore & 1 + 4\sqrt{2} > 3\sqrt{2} + 2 \end{aligned}$$

$$\begin{aligned} 2-1 \quad & (\sqrt{3} + \sqrt{2}) - (3\sqrt{2} - \sqrt{3}) = \sqrt{3} + \sqrt{2} - 3\sqrt{2} + \sqrt{3} \\ & = 2\sqrt{3} - 2\sqrt{2} = \sqrt{12} - \sqrt{8} > 0 \\ \therefore & \sqrt{3} + \sqrt{2} > 3\sqrt{2} - \sqrt{3} \end{aligned}$$

$$\begin{aligned} 2-2 \quad & (\sqrt{18} - 3) - (\sqrt{8} - 4) = 3\sqrt{2} - 3 - 2\sqrt{2} + 4 \\ & = \sqrt{2} + 1 > 0 \\ \therefore & \sqrt{18} - 3 > \sqrt{8} - 4 \end{aligned}$$

$$\begin{aligned} 3-1 \quad & (5\sqrt{3} - 3\sqrt{2}) - (\sqrt{2} + 2\sqrt{3}) = 5\sqrt{3} - 3\sqrt{2} - \sqrt{2} - 2\sqrt{3} \\ & = 3\sqrt{3} - 4\sqrt{2} \\ & = \sqrt{27} - \sqrt{32} < 0 \\ \therefore & 5\sqrt{3} - 3\sqrt{2} < \sqrt{2} + 2\sqrt{3} \end{aligned}$$

$$\begin{aligned} 3-2 \quad & (7 - \sqrt{3}) - (3\sqrt{3} + 1) = 7 - \sqrt{3} - 3\sqrt{3} - 1 \\ & = 6 - 4\sqrt{3} \\ & = \sqrt{36} - \sqrt{48} < 0 \\ \therefore & 7 - \sqrt{3} < 3\sqrt{3} + 1 \end{aligned}$$

$$\begin{aligned}
 4-1 \quad (\sqrt{7}-1)-(4-\sqrt{7}) &= \sqrt{7}-1-4+\sqrt{7} \\
 &= 2\sqrt{7}-5 \\
 &= \sqrt{28}-\sqrt{25} > 0 \\
 \therefore \sqrt{7}-1 &> 4-\sqrt{7}
 \end{aligned}$$

$$\begin{aligned}
 4-2 \quad (2\sqrt{5}-3)-\sqrt{5} &= \sqrt{5}-3 = \sqrt{5}-\sqrt{9} < 0 \\
 \therefore 2\sqrt{5}-3 &< \sqrt{5}
 \end{aligned}$$

STEP 2

기본연산 집중연습 | 16~22

p. 85 ~ p. 87

1-1 $-\sqrt{3}+\sqrt{7}$	1-2 $-\sqrt{3}-5\sqrt{6}$
1-3 $8\sqrt{2}-7\sqrt{3}$	1-4 $-2\sqrt{5}-\sqrt{7}$
1-5 $-\sqrt{2}+7\sqrt{5}$	1-6 $-2\sqrt{2}-5\sqrt{3}$
1-7 $\sqrt{3}-2\sqrt{6}$	1-8 $-\sqrt{2}-\sqrt{5}$
2-1 $5\sqrt{3}$	2-2 0
2-3 $\frac{4\sqrt{3}}{3}$	2-4 $\sqrt{2}$
2-5 $\frac{23\sqrt{2}}{15}$	2-6 $-\frac{5\sqrt{2}}{2}$
3-1 $\sqrt{15}+2\sqrt{3}$	3-2 $\sqrt{6}-3\sqrt{2}$
3-3 $\sqrt{6}-\sqrt{5}$	3-4 8
3-5 $\frac{\sqrt{10}-3\sqrt{6}}{2}$	3-6 $\frac{\sqrt{3}}{3}+\frac{\sqrt{2}}{2}$
4-1 $>$	4-2 $>$
4-3 $>$	4-4 $<$
4-5 $<$	4-6 $>$
4-7 $>$	4-8 $<$
5-1 $4\sqrt{6}$	5-2 $\frac{7\sqrt{6}}{6}$
5-3 $-\sqrt{2}$	5-4 $-4\sqrt{2}$
5-5 2	5-6 $-6+\sqrt{3}$
5-7 $4\sqrt{3}$	5-8 $-\frac{\sqrt{2}}{2}-\frac{\sqrt{6}}{6}$
5-9 $-2\sqrt{6}$	5-10 $-\sqrt{3}+5\sqrt{5}$

울면

$$\begin{aligned}
 1-3 \quad \sqrt{18}-4\sqrt{3}+5\sqrt{2}-\sqrt{27} &= 3\sqrt{2}-4\sqrt{3}+5\sqrt{2}-3\sqrt{3} \\
 &= 8\sqrt{2}-7\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 1-4 \quad 2\sqrt{5}+\sqrt{28}-\sqrt{80}-3\sqrt{7} &= 2\sqrt{5}+2\sqrt{7}-4\sqrt{5}-3\sqrt{7} \\
 &= -2\sqrt{5}-\sqrt{7}
 \end{aligned}$$

$$\begin{aligned}
 1-5 \quad \sqrt{32}+\sqrt{45}+4\sqrt{5}-\sqrt{50} &= 4\sqrt{2}+3\sqrt{5}+4\sqrt{5}-5\sqrt{2} \\
 &= -\sqrt{2}+7\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 1-6 \quad 2\sqrt{18}-4\sqrt{8}+\sqrt{75}-\sqrt{300} &= 2 \times 3\sqrt{2}-4 \times 2\sqrt{2}+5\sqrt{3}-10\sqrt{3} \\
 &= 6\sqrt{2}-8\sqrt{2}+5\sqrt{3}-10\sqrt{3} \\
 &= -2\sqrt{2}-5\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 1-7 \quad \sqrt{24}+\sqrt{48}-\sqrt{96}-\sqrt{27} &= 2\sqrt{6}+4\sqrt{3}-4\sqrt{6}-3\sqrt{3} \\
 &= \sqrt{3}-2\sqrt{6}
 \end{aligned}$$

$$\begin{aligned}
 1-8 \quad \sqrt{32}-\sqrt{50}+\sqrt{80}-\sqrt{125} &= 4\sqrt{2}-5\sqrt{2}+4\sqrt{5}-5\sqrt{5} \\
 &= -\sqrt{2}-\sqrt{5}
 \end{aligned}$$

$$2-1 \quad \sqrt{48}-\frac{6}{\sqrt{3}}+\sqrt{27}=4\sqrt{3}-2\sqrt{3}+3\sqrt{3}=5\sqrt{3}$$

$$2-2 \quad \sqrt{45}-\sqrt{125}+\frac{10}{\sqrt{5}}=3\sqrt{5}-5\sqrt{5}+2\sqrt{5}=0$$

$$\begin{aligned}
 2-3 \quad \sqrt{3}-\frac{2}{\sqrt{3}}+\sqrt{27}-\sqrt{12} &= \sqrt{3}-\frac{2\sqrt{3}}{3}+3\sqrt{3}-2\sqrt{3} \\
 &= 2\sqrt{3}-\frac{2\sqrt{3}}{3} \\
 &= \frac{4\sqrt{3}}{3}
 \end{aligned}$$

$$\begin{aligned}
 2-4 \quad \frac{\sqrt{18}}{15}+\frac{\sqrt{3}}{\sqrt{6}}+\frac{3\sqrt{2}}{10} &= \frac{3\sqrt{2}}{15}+\frac{1}{\sqrt{2}}+\frac{3\sqrt{2}}{10} \\
 &= \frac{\sqrt{2}}{5}+\frac{\sqrt{2}}{2}+\frac{3\sqrt{2}}{10} \\
 &= \frac{2\sqrt{2}}{10}+\frac{5\sqrt{2}}{10}+\frac{3\sqrt{2}}{10} \\
 &= \sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 2-5 \quad \sqrt{8}+\frac{2}{3\sqrt{2}}-\frac{\sqrt{32}}{5} &= 2\sqrt{2}+\frac{\sqrt{2}}{3}-\frac{4\sqrt{2}}{5} \\
 &= \frac{30\sqrt{2}}{15}+\frac{5\sqrt{2}}{15}-\frac{12\sqrt{2}}{15} \\
 &= \frac{23\sqrt{2}}{15}
 \end{aligned}$$

$$\begin{aligned}
 2-6 \quad \sqrt{50}-\frac{1}{\sqrt{2}}-7\sqrt{2} &= 5\sqrt{2}-\frac{\sqrt{2}}{2}-7\sqrt{2} \\
 &= -2\sqrt{2}-\frac{\sqrt{2}}{2} \\
 &= -\frac{5\sqrt{2}}{2}
 \end{aligned}$$

$$3-2 \quad \sqrt{3}(\sqrt{2}-\sqrt{6})=\sqrt{6}-\sqrt{18}=\sqrt{6}-3\sqrt{2}$$

$$3-3 \quad (\sqrt{18}-\sqrt{15}) \div \sqrt{3} = \frac{\sqrt{18}-\sqrt{15}}{\sqrt{3}} = \sqrt{6}-\sqrt{5}$$

$$\begin{aligned} \text{3-4 } (\sqrt{50} + \sqrt{18}) \div \sqrt{2} &= \frac{\sqrt{50} + \sqrt{18}}{\sqrt{2}} \\ &= \sqrt{25} + \sqrt{9} \\ &= 5 + 3 = 8 \end{aligned}$$

$$\text{3-5 } \frac{\sqrt{5} - 3\sqrt{3}}{\sqrt{2}} = \frac{(\sqrt{5} - 3\sqrt{3}) \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{10} - 3\sqrt{6}}{2}$$

$$\begin{aligned} \text{3-6 } \frac{\sqrt{2} + \sqrt{3}}{\sqrt{6}} &= \frac{(\sqrt{2} + \sqrt{3}) \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{12} + \sqrt{18}}{6} \\ &= \frac{2\sqrt{3} + 3\sqrt{2}}{6} \\ &= \frac{\sqrt{3}}{3} + \frac{\sqrt{2}}{2} \end{aligned}$$

$$\begin{aligned} \text{4-1 } (\sqrt{6} + 1) - 3 &= \sqrt{6} - 2 = \sqrt{6} - \sqrt{4} > 0 \\ \therefore \sqrt{6} + 1 &> 3 \end{aligned}$$

$$\begin{aligned} \text{4-2 } (\sqrt{6} - 1) - (\sqrt{6} - \sqrt{3}) &= \sqrt{6} - 1 - \sqrt{6} + \sqrt{3} \\ &= \sqrt{3} - 1 \\ &= \sqrt{3} - \sqrt{1} > 0 \\ \therefore \sqrt{6} - 1 &> \sqrt{6} - \sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{4-3 } (3\sqrt{2} - 1) - (2\sqrt{3} - 1) &= 3\sqrt{2} - 1 - 2\sqrt{3} + 1 \\ &= 3\sqrt{2} - 2\sqrt{3} \\ &= \sqrt{18} - \sqrt{12} > 0 \\ \therefore 3\sqrt{2} - 1 &> 2\sqrt{3} - 1 \end{aligned}$$

$$\begin{aligned} \text{4-4 } (1 - \sqrt{7}) - (2\sqrt{7} - 3) &= 1 - \sqrt{7} - 2\sqrt{7} + 3 \\ &= 4 - 3\sqrt{7} \\ &= \sqrt{16} - \sqrt{63} < 0 \\ \therefore 1 - \sqrt{7} &< 2\sqrt{7} - 3 \end{aligned}$$

$$\begin{aligned} \text{4-5 } (5\sqrt{2} - 1) - (5 + \sqrt{2}) &= 5\sqrt{2} - 1 - 5 - \sqrt{2} \\ &= 4\sqrt{2} - 6 \\ &= \sqrt{32} - \sqrt{36} < 0 \\ \therefore 5\sqrt{2} - 1 &< 5 + \sqrt{2} \end{aligned}$$

$$\begin{aligned} \text{4-6 } (4\sqrt{5} + 3\sqrt{6}) - (5\sqrt{5} + 2\sqrt{6}) &= 4\sqrt{5} + 3\sqrt{6} - 5\sqrt{5} - 2\sqrt{6} \\ &= -\sqrt{5} + \sqrt{6} > 0 \\ \therefore 4\sqrt{5} + 3\sqrt{6} &> 5\sqrt{5} + 2\sqrt{6} \end{aligned}$$

$$\begin{aligned} \text{4-7 } (1 + \sqrt{12}) - (2 + \sqrt{3}) &= 1 + 2\sqrt{3} - 2 - \sqrt{3} \\ &= \sqrt{3} - 1 \\ &= \sqrt{3} - \sqrt{1} > 0 \\ \therefore 1 + \sqrt{12} &> 2 + \sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{4-8 } (\sqrt{32} - 1) - (3\sqrt{2} + 1) &= 4\sqrt{2} - 1 - 3\sqrt{2} - 1 \\ &= \sqrt{2} - 2 \\ &= \sqrt{2} - \sqrt{4} < 0 \\ \therefore \sqrt{32} - 1 &< 3\sqrt{2} + 1 \end{aligned}$$

$$\text{5-1 } 6 \div \sqrt{6} + \sqrt{54} = \frac{6}{\sqrt{6}} + 3\sqrt{6} = \sqrt{6} + 3\sqrt{6} = 4\sqrt{6}$$

$$\text{5-2 } 2 \times \sqrt{6} - 5 \div \sqrt{6} = 2\sqrt{6} - \frac{5}{\sqrt{6}} = 2\sqrt{6} - \frac{5\sqrt{6}}{6} = \frac{7\sqrt{6}}{6}$$

$$\begin{aligned} \text{5-3 } 2(\sqrt{2} - \sqrt{3}) - \sqrt{3}(\sqrt{6} - 2) &= 2\sqrt{2} - 2\sqrt{3} - \sqrt{18} + 2\sqrt{3} \\ &= 2\sqrt{2} - 2\sqrt{3} - 3\sqrt{2} + 2\sqrt{3} \\ &= -\sqrt{2} \end{aligned}$$

$$\begin{aligned} \text{5-4 } 3\sqrt{7} - (6\sqrt{21} + 8\sqrt{6}) \div 2\sqrt{3} &= 3\sqrt{7} - \frac{6\sqrt{21} + 8\sqrt{6}}{2\sqrt{3}} \\ &= 3\sqrt{7} - 3\sqrt{7} - 4\sqrt{2} \\ &= -4\sqrt{2} \end{aligned}$$

$$\text{5-5 } (2\sqrt{3} + \sqrt{2})\sqrt{2} - 2\sqrt{6} = 2\sqrt{6} + 2 - 2\sqrt{6} = 2$$

$$\begin{aligned} \text{5-6 } 2\sqrt{3}(1 - \sqrt{3}) + \frac{3}{\sqrt{3}} - \sqrt{12} &= 2\sqrt{3} - 6 + \sqrt{3} - 2\sqrt{3} \\ &= -6 + \sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{5-7 } \frac{5 - \sqrt{15}}{\sqrt{5}} + \sqrt{5}(\sqrt{15} - 1) &= \sqrt{5} - \sqrt{3} + \sqrt{75} - \sqrt{5} \\ &= \sqrt{5} - \sqrt{3} + 5\sqrt{3} - \sqrt{5} \\ &= 4\sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{5-8 } \frac{3}{\sqrt{2}} + \frac{5}{\sqrt{6}} - \sqrt{2}(2 + \sqrt{3}) &= \frac{3\sqrt{2}}{2} + \frac{5\sqrt{6}}{6} - 2\sqrt{2} - \sqrt{6} \\ &= -\frac{\sqrt{2}}{2} - \frac{\sqrt{6}}{6} \end{aligned}$$

$$\begin{aligned} \text{5-9 } \sqrt{2}\left(\frac{3}{\sqrt{6}} - \frac{18}{\sqrt{12}}\right) + \sqrt{3}\left(\frac{6}{\sqrt{18}} - 1\right) &= \frac{3}{\sqrt{3}} - \frac{18}{\sqrt{6}} + \frac{6}{\sqrt{6}} - \sqrt{3} \\ &= \sqrt{3} - 3\sqrt{6} + \sqrt{6} - \sqrt{3} \\ &= -2\sqrt{6} \end{aligned}$$

$$\begin{aligned} \text{5-10 } \frac{3}{\sqrt{3}} + \sqrt{6} \times \sqrt{30} - \frac{\sqrt{10} + \sqrt{24}}{\sqrt{2}} &= \sqrt{3} + 6\sqrt{5} - \sqrt{5} - \sqrt{12} \\ &= \sqrt{3} + 6\sqrt{5} - \sqrt{5} - 2\sqrt{3} \\ &= -\sqrt{3} + 5\sqrt{5} \end{aligned}$$

STEP 3

기본연산 테스트

p. 88 ~ p. 89

1 (1) $3\sqrt{3}$ (2) $-3\sqrt{11}$ (3) $6\sqrt{7}$ (4) $-2\sqrt{31}$ (5) $9\sqrt{2}$

2 (1) $\frac{3\sqrt{5}}{4}$ (2) $\frac{\sqrt{14}}{11}$ (3) $\frac{\sqrt{13}}{10}$ (4) $\frac{2\sqrt{3}}{5}$

3 (1) 22.36 (2) 70.71 (3) 0.7071 (4) 0.2236

4 (1) $\frac{\sqrt{11}}{11}$ (2) $\frac{5\sqrt{7}}{14}$ (3) $\frac{\sqrt{15}}{25}$
(4) $\frac{2\sqrt{10}-\sqrt{30}}{5}$ (5) $\frac{3\sqrt{14}}{7}-2\sqrt{2}$

5 (1) $-\frac{3}{5}$ (2) $-5\sqrt{2}$ (3) 3 (4) $\frac{10\sqrt{5}}{3}$ (5) $-\frac{\sqrt{3}}{4}$

6 (1) $\sqrt{5}$ (2) $2\sqrt{3}-\sqrt{2}$ (3) $10\sqrt{2}-8\sqrt{3}$
(4) $\frac{8\sqrt{6}}{3}$ (5) $\frac{27\sqrt{2}}{4}$

7 (1) < (2) < (3) > (4) < (5) >

8 (1) $11\sqrt{3}$ (2) $15\sqrt{7}$ (3) $6+\sqrt{2}+\sqrt{5}$
(4) $2\sqrt{2}-3\sqrt{6}$ (5) $\frac{5\sqrt{3}}{3}-\frac{\sqrt{6}}{6}$

3 (1) $\sqrt{500}=\sqrt{100 \times 5}=10\sqrt{5}=10 \times 2.236=22.36$
(2) $\sqrt{5000}=\sqrt{100 \times 50}=10\sqrt{50}=10 \times 7.071=70.71$
(3) $\sqrt{0.5}=\sqrt{\frac{50}{100}}=\frac{\sqrt{50}}{10}=\frac{7.071}{10}=0.7071$
(4) $\sqrt{0.05}=\sqrt{\frac{5}{100}}=\frac{\sqrt{5}}{10}=\frac{2.236}{10}=0.2236$

4 (3) $\frac{\sqrt{3}}{\sqrt{125}}=\frac{\sqrt{3}}{5\sqrt{5}}=\frac{\sqrt{3} \times \sqrt{5}}{5\sqrt{5} \times \sqrt{5}}=\frac{\sqrt{15}}{25}$
(5) $\frac{6-4\sqrt{7}}{\sqrt{14}}=\frac{(6-4\sqrt{7}) \times \sqrt{14}}{\sqrt{14} \times \sqrt{14}}=\frac{6\sqrt{14}-4\sqrt{98}}{14}$
 $=\frac{6\sqrt{14}-28\sqrt{2}}{14}=\frac{3\sqrt{14}}{7}-2\sqrt{2}$

5 (1) $\frac{3}{\sqrt{10}} \times (-\sqrt{12}) \div \sqrt{30} = \frac{3}{\sqrt{10}} \times (-2\sqrt{3}) \times \frac{1}{\sqrt{30}}$
 $= -\frac{6}{10} = -\frac{3}{5}$

(2) $\sqrt{75} \div (-\sqrt{21}) \times \sqrt{14} = 5\sqrt{3} \times \left(-\frac{1}{\sqrt{21}}\right) \times \sqrt{14}$
 $= -5\sqrt{2}$

(3) $\sqrt{39} \div \sqrt{13} \div \sqrt{\frac{1}{3}} = \sqrt{\frac{39}{13}} \times \frac{1}{\sqrt{13}} \times \sqrt{3} = 3$

(4) $\frac{\sqrt{2}}{3} \times \frac{10}{\sqrt{3}} \div \sqrt{\frac{2}{15}} = \frac{\sqrt{2}}{3} \times \frac{10}{\sqrt{3}} \times \frac{\sqrt{15}}{\sqrt{2}} = \frac{10\sqrt{5}}{3}$

(5) $(-\sqrt{3}) \div (-\sqrt{8}) \div (-\sqrt{2})$
 $= (-\sqrt{3}) \times \left(-\frac{1}{2\sqrt{2}}\right) \times \left(-\frac{1}{\sqrt{2}}\right) = -\frac{\sqrt{3}}{4}$

6 (1) $\sqrt{45} + \sqrt{80} - 6\sqrt{5} = 3\sqrt{5} + 4\sqrt{5} - 6\sqrt{5} = \sqrt{5}$
(2) $\sqrt{48} + 4\sqrt{2} - \sqrt{50} - \sqrt{12} = 4\sqrt{3} + 4\sqrt{2} - 5\sqrt{2} - 2\sqrt{3}$
 $= 2\sqrt{3} - \sqrt{2}$

(3) $\sqrt{72} - \sqrt{75} + \sqrt{32} - \sqrt{27} = 6\sqrt{2} - 5\sqrt{3} + 4\sqrt{2} - 3\sqrt{3}$
 $= 10\sqrt{2} - 8\sqrt{3}$

(4) $\frac{18}{\sqrt{6}} - \sqrt{24} + \frac{5\sqrt{2}}{\sqrt{3}} = \frac{18\sqrt{6}}{6} - 2\sqrt{6} + \frac{5\sqrt{6}}{3}$
 $= 3\sqrt{6} - 2\sqrt{6} + \frac{5\sqrt{6}}{3} = \frac{8\sqrt{6}}{3}$

(5) $\frac{\sqrt{18}}{3} - \frac{\sqrt{3}}{2\sqrt{6}} + 3\sqrt{8} = \frac{3\sqrt{2}}{3} - \frac{1}{2\sqrt{2}} + 3 \times 2\sqrt{2}$
 $= \sqrt{2} - \frac{\sqrt{2}}{4} + 6\sqrt{2} = \frac{27\sqrt{2}}{4}$

7 (1) $3 - (\sqrt{5} + 1) = 3 - \sqrt{5} - 1 = 2 - \sqrt{5} = \sqrt{4} - \sqrt{5} < 0$
 $\therefore 3 < \sqrt{5} + 1$

(2) $(\sqrt{21} - 3) - 2 = \sqrt{21} - 5 = \sqrt{21} - \sqrt{25} < 0$
 $\therefore \sqrt{21} - 3 < 2$

(3) $(\sqrt{7} + 2) - (\sqrt{6} + 2) = \sqrt{7} + 2 - \sqrt{6} - 2$
 $= \sqrt{7} - \sqrt{6} > 0$
 $\therefore \sqrt{7} + 2 > \sqrt{6} + 2$

(4) $(4 - \sqrt{3}) - (\sqrt{19} - \sqrt{3}) = 4 - \sqrt{3} - \sqrt{19} + \sqrt{3}$
 $= 4 - \sqrt{19} = \sqrt{16} - \sqrt{19} < 0$
 $\therefore 4 - \sqrt{3} < \sqrt{19} - \sqrt{3}$

(5) $(8 - \sqrt{10}) - (\sqrt{55} - \sqrt{10}) = 8 - \sqrt{10} - \sqrt{55} + \sqrt{10}$
 $= 8 - \sqrt{55}$
 $= \sqrt{64} - \sqrt{55} > 0$
 $\therefore 8 - \sqrt{10} > \sqrt{55} - \sqrt{10}$

8 (1) $\frac{\sqrt{27}}{3} + 2\sqrt{5} \times \sqrt{15} = \frac{3\sqrt{3}}{3} + 2\sqrt{75} = \sqrt{3} + 10\sqrt{3} = 11\sqrt{3}$

(2) $6\sqrt{56} \div 2\sqrt{8} + 4\sqrt{21} \times \sqrt{3} = \frac{6\sqrt{56}}{2\sqrt{8}} + 4\sqrt{63}$
 $= 3\sqrt{7} + 12\sqrt{7} = 15\sqrt{7}$

(3) $\sqrt{3}(2\sqrt{3} + \sqrt{6}) - (\sqrt{24} - \sqrt{15}) \div \sqrt{3}$
 $= 6 + \sqrt{18} - \frac{\sqrt{24} - \sqrt{15}}{\sqrt{3}} = 6 + 3\sqrt{2} - \sqrt{8} + \sqrt{5}$
 $= 6 + 3\sqrt{2} - 2\sqrt{2} + \sqrt{5} = 6 + \sqrt{2} + \sqrt{5}$

(4) $\frac{\sqrt{18} + \sqrt{6}}{\sqrt{3}} + 2\sqrt{8} - \sqrt{3}(4\sqrt{2} + \sqrt{6})$
 $= \sqrt{6} + \sqrt{2} + 4\sqrt{2} - 4\sqrt{6} - \sqrt{18}$
 $= \sqrt{6} + \sqrt{2} + 4\sqrt{2} - 4\sqrt{6} - 3\sqrt{2}$
 $= 2\sqrt{2} - 3\sqrt{6}$

(5) $\frac{4-2\sqrt{2}}{\sqrt{3}} + \frac{\sqrt{2}+3}{\sqrt{6}}$
 $= \frac{(4-2\sqrt{2}) \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} + \frac{(\sqrt{2}+3) \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}}$
 $= \frac{4\sqrt{3}-2\sqrt{6}}{3} + \frac{\sqrt{12}+3\sqrt{6}}{6}$
 $= \frac{8\sqrt{3}-4\sqrt{6}+2\sqrt{3}+3\sqrt{6}}{6}$
 $= \frac{10\sqrt{3}-\sqrt{6}}{6} = \frac{5\sqrt{3}}{3} - \frac{\sqrt{6}}{6}$

3

다항식의 곱셈

STEP 1

01 (다항식) × (다항식) (1)

p. 92

- | | |
|--------------------------|-----------------------------|
| 1-1 ay, by | 1-2 $3ab - 4a + 6b - 8$ |
| 2-1 $2xy + 10x - y - 5$ | 2-2 $xy + 3x + 2y + 6$ |
| 3-1 $2xy - 4x + 5y - 10$ | 3-2 $2ac + 3ad - 2bc - 3bd$ |
| 4-1 $2a^2 + 10a + 8$ | 4-2 $2a^2 + 7a + 3$ |
| 5-1 $x^2 + 2xy - 15y^2$ | 5-2 $3x^2 + 5x - 2$ |

4-1 $(a+1)(2a+8) = 2a^2 + 8a + 2a + 8 = 2a^2 + 10a + 8$

4-2 $(a+3)(2a+1) = 2a^2 + a + 6a + 3 = 2a^2 + 7a + 3$

5-1 $(x-3y)(x+5y) = x^2 + 5xy - 3xy - 15y^2$
 $= x^2 + 2xy - 15y^2$

5-2 $(3x-1)(x+2) = 3x^2 + 6x - x - 2 = 3x^2 + 5x - 2$

02 (다항식) × (다항식) (2)

p. 93

- | | |
|--------------------------------------|-------------------------------------|
| 1-1 $6ab, 5$ | 1-2 $a^2 - 2ab + b^2 + a - b$ |
| 2-1 $6x^2 + 9xy - 17x - 3y + 5$ | 2-2 $2x^2 - 7xy + 6y^2 + 2x - 4y$ |
| 3-1 $x^2 + xy - 2x - y + 1$ | 3-2 $x^2 + 2xy + y^2 - x - y$ |
| 4-1 $x^2 - 4xy + 3y^2 - 2x + 2y$ | 4-2 $6a^2 - 10ab - 4b^2 + 15a + 5b$ |
| 5-1 $-3x^2 + 8xy - 5y^2 - 30x + 50y$ | |
| 5-2 $2x^2 - 5xy - 12y^2 + 6x + 9y$ | |

1-2 $(a-b)(a-b+1) = a^2 - ab + a - ab + b^2 - b$
 $= a^2 - 2ab + b^2 + a - b$

2-1 $(2x+3y-5)(3x-1) = 6x^2 - 2x + 9xy - 3y - 15x + 5$
 $= 6x^2 + 9xy - 17x - 3y + 5$

2-2 $(x-2y)(2x-3y+2) = 2x^2 - 3xy + 2x - 4xy + 6y^2 - 4y$
 $= 2x^2 - 7xy + 6y^2 + 2x - 4y$

3-1 $(x-1)(x+y-1) = x^2 + xy - x - x - y + 1$
 $= x^2 + xy - 2x - y + 1$

3-2 $(x+y)(x+y-1) = x^2 + xy - x + xy + y^2 - y$
 $= x^2 + 2xy + y^2 - x - y$

4-1 $(x-3y-2)(x-y) = x^2 - xy - 3xy + 3y^2 - 2x + 2y$
 $= x^2 - 4xy + 3y^2 - 2x + 2y$

4-2 $(3a+b)(2a-4b+5)$
 $= 6a^2 - 12ab + 15a + 2ab - 4b^2 + 5b$
 $= 6a^2 - 10ab - 4b^2 + 15a + 5b$

5-1 $(x-y+10)(-3x+5y)$
 $= -3x^2 + 5xy + 3xy - 5y^2 - 30x + 50y$
 $= -3x^2 + 8xy - 5y^2 - 30x + 50y$

5-2 $(2x+3y)(x-4y+3)$
 $= 2x^2 - 8xy + 6x + 3xy - 12y^2 + 9y$
 $= 2x^2 - 5xy - 12y^2 + 6x + 9y$

03 곱셈 공식 (1) : 합, 차의 제곱

p. 94 ~ p. 96

- | | |
|---|-------------------------------------|
| 1-1 $x, 5, 10, 25$ | 1-2 $x^2 + 2x + 1$ |
| 2-1 $x^2 + 6x + 9$ | 2-2 $x^2 + 14x + 49$ |
| 3-1 $x, 14$ | 3-2 $x^2 - 6x + 9$ |
| 4-1 $x^2 - 10x + 25$ | 4-2 $x^2 - 8x + 16$ |
| 5-1 $a^2 + \frac{3}{2}a + \frac{9}{16}$ | 5-2 $a^2 - 7a + \frac{49}{4}$ |
| 6-1 $2x, 4, 4$ | 6-2 $16x^2 + 24x + 9$ |
| 7-1 $9x^2 - 12x + 4$ | 7-2 $4x^2 - 20x + 25$ |
| 8-1 $\frac{1}{4}x^2 + x + 1$ | 8-2 $\frac{9}{4}x^2 - 12x + 16$ |
| 9-1 $y, 4, y$ | 9-2 $9x^2 + 24xy + 16y^2$ |
| 10-1 $49a^2 - 112ab + 64b^2$ | 10-2 $25a^2 - 60ab + 36b^2$ |
| 11-1 $x^2 + \frac{2}{3}xy + \frac{1}{9}y^2$ | 11-2 $25x^2 - 5xy + \frac{1}{4}y^2$ |
| 12-1 $-, 2x, 4$ | 12-2 $x^2 + 6x + 9$ |
| 13-1 $4x^2 + 4x + 1$ | 13-2 $x^2 + x + \frac{1}{4}$ |
| 14-1 $9x^2 + 12xy + 4y^2$ | 14-2 $4x^2 + 20xy + 25y^2$ |
| 15-1 $-, 2y, 4$ | 15-2 $x^2 - 4x + 4$ |
| 16-1 $9x^2 - 30xy + 25y^2$ | 16-2 $x^2 - 8xy + 16y^2$ |
| 17-1 $\frac{1}{4}x^2 - 4x + 16$ | 17-2 $\frac{9}{16}x^2 - 3x + 4$ |

1-2 $(x+1)^2 = x^2 + 2 \times x \times 1 + 1^2 = x^2 + 2x + 1$

2-1 $(x+3)^2 = x^2 + 2 \times x \times 3 + 3^2 = x^2 + 6x + 9$

2-2 $(x+7)^2 = x^2 + 2 \times x \times 7 + 7^2 = x^2 + 14x + 49$

3-2 $(x-3)^2 = x^2 - 2 \times x \times 3 + 3^2 = x^2 - 6x + 9$

4-1 $(x-5)^2 = x^2 - 2 \times x \times 5 + 5^2 = x^2 - 10x + 25$

$$4-2 \quad (x-4)^2 = x^2 - 2 \times x \times 4 + 4^2 = x^2 - 8x + 16$$

$$5-1 \quad \left(a + \frac{3}{4}\right)^2 = a^2 + 2 \times a \times \frac{3}{4} + \left(\frac{3}{4}\right)^2 = a^2 + \frac{3}{2}a + \frac{9}{16}$$

$$5-2 \quad \left(a - \frac{7}{2}\right)^2 = a^2 - 2 \times a \times \frac{7}{2} + \left(\frac{7}{2}\right)^2 = a^2 - 7a + \frac{49}{4}$$

$$6-2 \quad (4x+3)^2 = (4x)^2 + 2 \times 4x \times 3 + 3^2 = 16x^2 + 24x + 9$$

$$7-1 \quad (3x-2)^2 = (3x)^2 - 2 \times 3x \times 2 + 2^2 = 9x^2 - 12x + 4$$

$$7-2 \quad (2x-5)^2 = (2x)^2 - 2 \times 2x \times 5 + 5^2 = 4x^2 - 20x + 25$$

$$8-1 \quad \left(\frac{1}{2}x+1\right)^2 = \left(\frac{1}{2}x\right)^2 + 2 \times \frac{1}{2}x \times 1 + 1^2 = \frac{1}{4}x^2 + x + 1$$

$$8-2 \quad \left(\frac{3}{2}x-4\right)^2 = \left(\frac{3}{2}x\right)^2 - 2 \times \frac{3}{2}x \times 4 + 4^2 \\ = \frac{9}{4}x^2 - 12x + 16$$

$$9-2 \quad (3x+4y)^2 = (3x)^2 + 2 \times 3x \times 4y + (4y)^2 \\ = 9x^2 + 24xy + 16y^2$$

$$10-1 \quad (7a-8b)^2 = (7a)^2 - 2 \times 7a \times 8b + (8b)^2 \\ = 49a^2 - 112ab + 64b^2$$

$$10-2 \quad (5a-6b)^2 = (5a)^2 - 2 \times 5a \times 6b + (6b)^2 \\ = 25a^2 - 60ab + 36b^2$$

$$11-1 \quad \left(x + \frac{1}{3}y\right)^2 = x^2 + 2 \times x \times \frac{1}{3}y + \left(\frac{1}{3}y\right)^2 \\ = x^2 + \frac{2}{3}xy + \frac{1}{9}y^2$$

$$11-2 \quad \left(5x - \frac{1}{2}y\right)^2 = (5x)^2 - 2 \times 5x \times \frac{1}{2}y + \left(\frac{1}{2}y\right)^2 \\ = 25x^2 - 5xy + \frac{1}{4}y^2$$

$$12-2 \quad (-x-3)^2 = \{-(x+3)\}^2 = (x+3)^2 = x^2 + 6x + 9$$

$$13-1 \quad (-2x-1)^2 = \{-(2x+1)\}^2 = (2x+1)^2 \\ = 4x^2 + 4x + 1$$

$$13-2 \quad \left(-x - \frac{1}{2}\right)^2 = \left\{-\left(x + \frac{1}{2}\right)\right\}^2 = \left(x + \frac{1}{2}\right)^2 \\ = x^2 + x + \frac{1}{4}$$

$$14-1 \quad (-3x-2y)^2 = \{-(3x+2y)\}^2 = (3x+2y)^2 \\ = 9x^2 + 12xy + 4y^2$$

$$14-2 \quad (-2x-5y)^2 = \{-(2x+5y)\}^2 = (2x+5y)^2 \\ = 4x^2 + 20xy + 25y^2$$

$$15-2 \quad (-x+2)^2 = \{-(x-2)\}^2 = (x-2)^2 = x^2 - 4x + 4$$

$$16-1 \quad (-3x+5y)^2 = \{-(3x-5y)\}^2 = (3x-5y)^2 \\ = 9x^2 - 30xy + 25y^2$$

$$16-2 \quad (-x+4y)^2 = \{-(x-4y)\}^2 = (x-4y)^2 \\ = x^2 - 8xy + 16y^2$$

$$17-1 \quad \left(-\frac{1}{2}x+4\right)^2 = \left\{-\left(\frac{1}{2}x-4\right)\right\}^2 = \left(\frac{1}{2}x-4\right)^2 \\ = \frac{1}{4}x^2 - 4x + 16$$

$$17-2 \quad \left(-\frac{3}{4}x+2\right)^2 = \left\{-\left(\frac{3}{4}x-2\right)\right\}^2 = \left(\frac{3}{4}x-2\right)^2 \\ = \frac{9}{16}x^2 - 3x + 4$$

04 곱셈 공식 (2) : 합과 차의 곱

p. 97 ~ p. 99

$$1-1 \quad 2, 4$$

$$1-2 \quad x^2 - 25$$

$$2-1 \quad x^2 - 1$$

$$2-2 \quad a^2 - 9$$

$$3-1 \quad x^2 - \frac{1}{4}$$

$$3-2 \quad x^2 - \frac{1}{9}$$

$$4-1 \quad x, x^2$$

$$4-2 \quad 64 - a^2$$

$$5-1 \quad 9 - x^2$$

$$5-2 \quad 1 - x^2$$

$$6-1 \quad 5x, 25x^2, 9$$

$$6-2 \quad 4x^2 - 1$$

$$7-1 \quad 9x^2 - 4$$

$$7-2 \quad 25x^2 - 1$$

$$8-1 \quad 25 - 4x^2$$

$$8-2 \quad 1 - 9x^2$$

$$9-1 \quad 2y, 4y^2$$

$$9-2 \quad x^2 - 81y^2$$

$$10-1 \quad 49a^2 - 4b^2$$

$$10-2 \quad 4x^2 - 9y^2$$

$$11-1 \quad \frac{1}{4}x^2 - 9y^2$$

$$11-2 \quad \frac{9}{16}x^2 - \frac{1}{25}y^2$$

$$12-1 \quad -x, x^2, 1$$

$$12-2 \quad x^2 - 25$$

$$13-1 \quad 9a^2 - 4$$

$$13-2 \quad 9x^2 - 25y^2$$

$$14-1 \quad 4x^2 - 9y^2$$

$$14-2 \quad \frac{1}{9}x^2 - 16y^2$$

$$15-1 \quad a, a^2$$

$$15-2 \quad 1 - 9a^2$$

$$16-1 \quad 36 - a^2$$

$$16-2 \quad 4y^2 - x^2$$

$$17-1 \quad 16 - y^2$$

$$17-2 \quad 9x^2 - 4y^2$$

$$1-2 \quad (x+5)(x-5) = x^2 - 5^2 = x^2 - 25$$

$$2-1 \quad (x-1)(x+1) = x^2 - 1^2 = x^2 - 1$$

$$2-2 \quad (a+3)(a-3) = a^2 - 3^2 = a^2 - 9$$

$$3-1 \quad \left(x - \frac{1}{2}\right)\left(x + \frac{1}{2}\right) = x^2 - \left(\frac{1}{2}\right)^2 = x^2 - \frac{1}{4}$$

$$3-2 \quad \left(x + \frac{1}{3}\right)\left(x - \frac{1}{3}\right) = x^2 - \left(\frac{1}{3}\right)^2 = x^2 - \frac{1}{9}$$

$$4-2 \quad (8+a)(8-a) = 8^2 - a^2 = 64 - a^2$$

$$5-1 \quad (3-x)(3+x) = 3^2 - x^2 = 9 - x^2$$

$$5-2 \quad (1-x)(1+x) = 1^2 - x^2 = 1 - x^2$$

$$6-2 \quad (2x+1)(2x-1) = (2x)^2 - 1^2 = 4x^2 - 1$$

$$7-1 \quad (3x-2)(3x+2) = (3x)^2 - 2^2 = 9x^2 - 4$$

$$7-2 \quad (5x-1)(5x+1) = (5x)^2 - 1^2 = 25x^2 - 1$$

$$8-1 \quad (5-2x)(5+2x) = 5^2 - (2x)^2 = 25 - 4x^2$$

$$8-2 \quad (1+3x)(1-3x) = 1^2 - (3x)^2 = 1 - 9x^2$$

$$9-2 \quad (x+9y)(x-9y) = x^2 - (9y)^2 = x^2 - 81y^2$$

$$10-1 \quad (7a-2b)(7a+2b) = (7a)^2 - (2b)^2 = 49a^2 - 4b^2$$

$$10-2 \quad (2x-3y)(2x+3y) = (2x)^2 - (3y)^2 = 4x^2 - 9y^2$$

$$11-1 \quad \left(\frac{1}{2}x + 3y\right)\left(\frac{1}{2}x - 3y\right) = \left(\frac{1}{2}x\right)^2 - (3y)^2 = \frac{1}{4}x^2 - 9y^2$$

$$11-2 \quad \left(\frac{3}{4}x + \frac{1}{5}y\right)\left(\frac{3}{4}x - \frac{1}{5}y\right) = \left(\frac{3}{4}x\right)^2 - \left(\frac{1}{5}y\right)^2 \\ = \frac{9}{16}x^2 - \frac{1}{25}y^2$$

$$12-2 \quad (-x+5)(-x-5) = (-x)^2 - 5^2 = x^2 - 25$$

$$13-1 \quad (-3a+2)(-3a-2) = (-3a)^2 - 2^2 = 9a^2 - 4$$

$$13-2 \quad (-3x+5y)(-3x-5y) = (-3x)^2 - (5y)^2 = 9x^2 - 25y^2$$

$$14-1 \quad (-2x-3y)(-2x+3y) = (-2x)^2 - (3y)^2 = 4x^2 - 9y^2$$

$$14-2 \quad \left(-\frac{1}{3}x - 4y\right)\left(-\frac{1}{3}x + 4y\right) = \left(-\frac{1}{3}x\right)^2 - (4y)^2 \\ = \frac{1}{9}x^2 - 16y^2$$

$$15-2 \quad (3a+1)(-3a+1) = (1+3a)(1-3a) \\ = 1^2 - (3a)^2 = 1 - 9a^2$$

$$16-1 \quad (-a-6)(a-6) = (-6-a)(-6+a) \\ = (-6)^2 - a^2 = 36 - a^2$$

$$16-2 \quad (-x-2y)(x-2y) = (-2y-x)(-2y+x) \\ = (-2y)^2 - x^2 = 4y^2 - x^2$$

$$17-1 \quad (4-y)(y+4) = (4-y)(4+y) = 4^2 - y^2 = 16 - y^2$$

$$17-2 \quad (3x-2y)(2y+3x) = (3x-2y)(3x+2y) \\ = (3x)^2 - (2y)^2 \\ = 9x^2 - 4y^2$$

STEP 2

기본연산 집중연습 | 01~04

p. 100 ~ p. 101

$$1-1 \quad 6ab + 8ac + 3b + 4c$$

$$1-2 \quad 12ab - 20ac + 6b - 10c$$

$$1-3 \quad 6x^2 - 7x + 2$$

$$1-4 \quad 2x^2 + 5xy + 2y^2$$

$$1-5 \quad x^2 - y^2 - x - y$$

$$1-6 \quad x^2 - 4xy + 3y^2 - 2x + 2y$$

$$1-7 \quad 2a^2 - ab - b^2 - 3a + 3b$$

$$1-8 \quad 4a^2 - 8ab + 3b^2 - 2ac + bc$$

$$2-1 \quad \times, 4x^2 - 12xy + 9y^2$$

$$2-2 \quad \times, x^2 - 1$$

$$2-3 \quad \times, 9x^2 - 24xy + 16y^2$$

$$2-4 \quad \times, x^2 - 9$$

$$3-1 \quad x^2 + 8x + 16$$

$$3-2 \quad 9x^2 + 12x + 4$$

$$3-3 \quad 25x^2 - 10xy + y^2$$

$$3-4 \quad 4x^2 - 28x + 49$$

$$3-5 \quad 4x^2 + 12x + 9$$

$$3-6 \quad x^2 - 36$$

$$3-7 \quad 81 - 64x^2$$

$$3-8 \quad 1 - 9x^2$$

$$3-9 \quad 25y^2 - 9x^2$$

4

$$1-5 \quad (x+y)(x-y-1) = x^2 - xy - x + xy - y^2 - y \\ = x^2 - y^2 - x - y$$

$$1-6 \quad (x-y)(x-3y-2) = x^2 - 3xy - 2x - xy + 3y^2 + 2y \\ = x^2 - 4xy + 3y^2 - 2x + 2y$$

$$1-7 \quad (2a+b-3)(a-b) = 2a^2 - 2ab + ab - b^2 - 3a + 3b \\ = 2a^2 - ab - b^2 - 3a + 3b$$

$$1-8 \quad (2a-3b-c)(2a-b) \\ = 4a^2 - 2ab - 6ab + 3b^2 - 2ac + bc \\ = 4a^2 - 8ab + 3b^2 - 2ac + bc$$

$x^2 - 36$	$4x^2 - 12x + 9$	$1 - 9x^2$	$x^2 + 16$
$x^2 + 8x + 16$	$-4x^2 + 49$	$4x^2 + 12x + 9$	$5x^2 - y^2$
$25y^2 - 9x^2$	$9x^2 + 12x + 4$	$81 - 64x^2$	$4x^2 - 28x + 49$
$x^2 - 1$	$x^2 - 12$	$25x^2 - 10xy + y^2$	$x^2 + 12x + 36$

STEP 1

05 곱셈 공식 (3) :

x 의 계수가 1인 두 일차식의 곱 (1)

p. 102 ~ p. 103

1-1	5, 4	1-2	$x^2+7x+10$
2-1	x^2+5x+4	2-2	$x^2+9x+18$
3-1	$x^2+13x+36$	3-2	$x^2+15x+56$
4-1	5, 6	4-2	x^2-3x+2
5-1	$x^2-9x+20$	5-2	$x^2-13x+30$
6-1	2, 15	6-2	x^2-2x-8
7-1	x^2-6x-7	7-2	$x^2-5x-24$
8-1	$x^2-4x-21$	8-2	$x^2+2x-24$
9-1	x^2-x-30	9-2	x^2-x-72
10-1	$x^2-\frac{1}{6}x-\frac{1}{6}$	10-2	$x^2-\frac{1}{6}x-\frac{1}{3}$
11-1	$x^2-\frac{6}{5}x-\frac{8}{5}$	11-2	$x^2+\frac{1}{20}x-\frac{1}{20}$

$$1-2 \quad (x+2)(x+5)=x^2+(2+5)x+2 \times 5=x^2+7x+10$$

$$2-1 \quad (x+1)(x+4)=x^2+(1+4)x+1 \times 4=x^2+5x+4$$

$$2-2 \quad (x+3)(x+6)=x^2+(3+6)x+3 \times 6=x^2+9x+18$$

$$3-1 \quad (x+4)(x+9)=x^2+(4+9)x+4 \times 9=x^2+13x+36$$

$$3-2 \quad (x+7)(x+8)=x^2+(7+8)x+7 \times 8=x^2+15x+56$$

$$4-2 \quad (x-1)(x-2)=x^2+(-1-2)x+(-1) \times (-2) \\ =x^2-3x+2$$

$$5-1 \quad (x-5)(x-4)=x^2+(-5-4)x+(-5) \times (-4) \\ =x^2-9x+20$$

$$5-2 \quad (x-10)(x-3)=x^2+(-10-3)x+(-10) \times (-3) \\ =x^2-13x+30$$

$$6-2 \quad (x-4)(x+2)=x^2+(-4+2)x+(-4) \times 2 \\ =x^2-2x-8$$

$$7-1 \quad (x-7)(x+1)=x^2+(-7+1)x+(-7) \times 1 \\ =x^2-6x-7$$

$$7-2 \quad (x-8)(x+3)=x^2+(-8+3)x+(-8) \times 3 \\ =x^2-5x-24$$

$$8-1 \quad (x+3)(x-7)=x^2+(3-7)x+3 \times (-7) \\ =x^2-4x-21$$

$$8-2 \quad (x+6)(x-4)=x^2+(6-4)x+6 \times (-4) \\ =x^2+2x-24$$

$$9-1 \quad (x+5)(x-6)=x^2+(5-6)x+5 \times (-6) \\ =x^2-x-30$$

$$9-2 \quad (x+8)(x-9)=x^2+(8-9)x+8 \times (-9) \\ =x^2-x-72$$

$$10-1 \quad \left(x-\frac{1}{2}\right)\left(x+\frac{1}{3}\right)=x^2+\left(-\frac{1}{2}+\frac{1}{3}\right)x+\left(-\frac{1}{2}\right) \times \frac{1}{3} \\ =x^2-\frac{1}{6}x-\frac{1}{6}$$

$$10-2 \quad \left(x-\frac{2}{3}\right)\left(x+\frac{1}{2}\right)=x^2+\left(-\frac{2}{3}+\frac{1}{2}\right)x+\left(-\frac{2}{3}\right) \times \frac{1}{2} \\ =x^2-\frac{1}{6}x-\frac{1}{3}$$

$$11-1 \quad \left(x+\frac{4}{5}\right)(x-2)=x^2+\left(\frac{4}{5}-2\right)x+\frac{4}{5} \times (-2) \\ =x^2-\frac{6}{5}x-\frac{8}{5}$$

$$11-2 \quad \left(x+\frac{1}{4}\right)\left(x-\frac{1}{5}\right)=x^2+\left(\frac{1}{4}-\frac{1}{5}\right)x+\frac{1}{4} \times \left(-\frac{1}{5}\right) \\ =x^2+\frac{1}{20}x-\frac{1}{20}$$

06 곱셈 공식 (3) : x 의 계수가 1인 두 일차식의 곱 (2) p. 104

1-1	16y, 16y, 13, 48y ²	1-2	$x^2+5xy-36y^2$
2-1	$x^2+5xy+6y^2$	2-2	$x^2+8xy+15y^2$
3-1	$x^2-10xy+21y^2$	3-2	$x^2-9xy+20y^2$
4-1	$x^2-2xy-8y^2$	4-2	$x^2+5xy-14y^2$
5-1	$x^2-xy-72y^2$	5-2	$x^2+5xy-66y^2$

$$1-2 \quad (x-4y)(x+9y)=x^2+(-4y+9y)x+(-4y) \times 9y \\ =x^2+5xy-36y^2$$

$$2-1 \quad (x+2y)(x+3y)=x^2+(2y+3y)x+2y \times 3y \\ =x^2+5xy+6y^2$$

$$2-2 \quad (x+3y)(x+5y)=x^2+(3y+5y)x+3y \times 5y \\ =x^2+8xy+15y^2$$

$$3-1 \quad (x-3y)(x-7y)=x^2+(-3y-7y)x+(-3y) \times (-7y) \\ =x^2-10xy+21y^2$$

$$\begin{aligned} \text{3-2 } (x-5y)(x-4y) &= x^2 + (-5y-4y)x + (-5y) \times (-4y) \\ &= x^2 - 9xy + 20y^2 \end{aligned}$$

$$\begin{aligned} \text{4-1 } (x+2y)(x-4y) &= x^2 + (2y-4y)x + 2y \times (-4y) \\ &= x^2 - 2xy - 8y^2 \end{aligned}$$

$$\begin{aligned} \text{4-2 } (x+7y)(x-2y) &= x^2 + (7y-2y)x + 7y \times (-2y) \\ &= x^2 + 5xy - 14y^2 \end{aligned}$$

$$\begin{aligned} \text{5-1 } (x+8y)(x-9y) &= x^2 + (8y-9y)x + 8y \times (-9y) \\ &= x^2 - xy - 72y^2 \end{aligned}$$

$$\begin{aligned} \text{5-2 } (x-6y)(x+11y) &= x^2 + (-6y+11y)x + (-6y) \times 11y \\ &= x^2 + 5xy - 66y^2 \end{aligned}$$

07 곱셈 공식 (4) :

x의 계수가 10이 아닌 두 일차식의 곱 (1) p. 105 ~ p. 106

1-1	3, 6, 7, 2	1-2	$12x^2 + 7x + 1$
2-1	$8x^2 + 24x + 18$	2-2	$5x^2 + 22x + 8$
3-1	$28x^2 + 19x + 3$	3-2	$9x^2 + 30x + 24$
4-1	-4, 1, 9, 4	4-2	$2x^2 - 11x + 15$
5-1	$12x^2 - 13x + 3$	5-2	$5x^2 - 31x + 6$
6-1	4, 2, 2	6-2	$4x^2 + 5x - 21$
7-1	$6x^2 + x - 2$	7-2	$12x^2 + 5x - 3$
8-1	$8x^2 + 8x - 6$	8-2	$12x^2 - 9x - 30$
9-1	$4x^2 - \frac{5}{6}x - \frac{1}{4}$	9-2	$9x^2 - \frac{1}{2}x - \frac{1}{3}$
10-1	$8x^2 + 8xy - 6y^2$	10-2	$6x^2 - 7xy - 20y^2$
11-1	$4x^2 + 5xy - 21y^2$	11-2	$12x^2 - 9xy - 30y^2$

$$\begin{aligned} \text{1-2 } (3x+1)(4x+1) &= (3 \times 4)x^2 + (3 \times 1 + 1 \times 4)x + 1 \times 1 \\ &= 12x^2 + 7x + 1 \end{aligned}$$

$$\begin{aligned} \text{2-1 } (2x+3)(4x+6) &= (2 \times 4)x^2 + (2 \times 6 + 3 \times 4)x + 3 \times 6 \\ &= 8x^2 + 24x + 18 \end{aligned}$$

$$\begin{aligned} \text{2-2 } (x+4)(5x+2) &= (1 \times 5)x^2 + (1 \times 2 + 4 \times 5)x + 4 \times 2 \\ &= 5x^2 + 22x + 8 \end{aligned}$$

$$\begin{aligned} \text{3-1 } (7x+3)(4x+1) &= (7 \times 4)x^2 + (7 \times 1 + 3 \times 4)x + 3 \times 1 \\ &= 28x^2 + 19x + 3 \end{aligned}$$

$$\begin{aligned} \text{3-2 } (3x+6)(3x+4) &= (3 \times 3)x^2 + (3 \times 4 + 6 \times 3)x + 6 \times 4 \\ &= 9x^2 + 30x + 24 \end{aligned}$$

$$\begin{aligned} \text{4-2 } (x-3)(2x-5) &= (1 \times 2)x^2 + \{1 \times (-5) + (-3) \times 2\}x + (-3) \times (-5) \\ &= 2x^2 - 11x + 15 \end{aligned}$$

$$\begin{aligned} \text{5-1 } (3x-1)(4x-3) &= (3 \times 4)x^2 + \{3 \times (-3) + (-1) \times 4\}x + (-1) \times (-3) \\ &= 12x^2 - 13x + 3 \end{aligned}$$

$$\begin{aligned} \text{5-2 } (5x-1)(x-6) &= (5 \times 1)x^2 + \{5 \times (-6) + (-1) \times 1\}x + (-1) \times (-6) \\ &= 5x^2 - 31x + 6 \end{aligned}$$

$$\begin{aligned} \text{6-2 } (4x-7)(x+3) &= (4 \times 1)x^2 + \{4 \times 3 + (-7) \times 1\}x + (-7) \times 3 \\ &= 4x^2 + 5x - 21 \end{aligned}$$

$$\begin{aligned} \text{7-1 } (2x-1)(3x+2) &= (2 \times 3)x^2 + \{2 \times 2 + (-1) \times 3\}x + (-1) \times 2 \\ &= 6x^2 + x - 2 \end{aligned}$$

$$\begin{aligned} \text{7-2 } (3x-1)(4x+3) &= (3 \times 4)x^2 + \{3 \times 3 + (-1) \times 4\}x + (-1) \times 3 \\ &= 12x^2 + 5x - 3 \end{aligned}$$

$$\begin{aligned} \text{8-1 } (2x+3)(4x-2) &= (2 \times 4)x^2 + \{2 \times (-2) + 3 \times 4\}x + 3 \times (-2) \\ &= 8x^2 + 8x - 6 \end{aligned}$$

$$\begin{aligned} \text{8-2 } (4x+5)(3x-6) &= (4 \times 3)x^2 + \{4 \times (-6) + 5 \times 3\}x + 5 \times (-6) \\ &= 12x^2 - 9x - 30 \end{aligned}$$

$$\begin{aligned} \text{9-1 } \left(2x - \frac{3}{4}\right)\left(2x + \frac{1}{3}\right) &= (2 \times 2)x^2 + \left\{2 \times \frac{1}{3} + \left(-\frac{3}{4}\right) \times 2\right\}x + \left(-\frac{3}{4}\right) \times \frac{1}{3} \\ &= 4x^2 - \frac{5}{6}x - \frac{1}{4} \end{aligned}$$

$$\begin{aligned} \text{9-2 } \left(3x + \frac{1}{2}\right)\left(3x - \frac{2}{3}\right) &= (3 \times 3)x^2 + \left\{3 \times \left(-\frac{2}{3}\right) + \frac{1}{2} \times 3\right\}x + \frac{1}{2} \times \left(-\frac{2}{3}\right) \\ &= 9x^2 - \frac{1}{2}x - \frac{1}{3} \end{aligned}$$

$$\begin{aligned} \text{10-1 } (2x+3y)(4x-2y) &= (2 \times 4)x^2 + \{2 \times (-2y) + 3y \times 4\}x + 3y \times (-2y) \\ &= 8x^2 + 8xy - 6y^2 \end{aligned}$$

$$\begin{aligned}
 10-2 & (3x+4y)(2x-5y) \\
 & = (3 \times 2)x^2 + \{3 \times (-5y) + 4y \times 2\}x + 4y \times (-5y) \\
 & = 6x^2 - 7xy - 20y^2
 \end{aligned}$$

$$\begin{aligned}
 11-1 & (4x-7y)(x+3y) \\
 & = (4 \times 1)x^2 + \{4 \times 3y + (-7y) \times 1\}x + (-7y) \times 3y \\
 & = 4x^2 + 5xy - 21y^2
 \end{aligned}$$

$$\begin{aligned}
 11-2 & (3x-6y)(4x+5y) \\
 & = (3 \times 4)x^2 + \{3 \times 5y + (-6y) \times 4\}x + (-6y) \times 5y \\
 & = 12x^2 - 9xy - 30y^2
 \end{aligned}$$

08 곱셈 공식 (4) :

x 의 계수가 10이 아닌 두 일차식의 곱 (2)

p. 107

1-1	$-12, 11, 2$	1-2	$-2x^2 - 17x - 21$
2-1	$-6x^2 - 13x - 5$	2-2	$-10x^2 + 9x + 9$
3-1	$-6x^2 + 19x - 10$	3-2	$-21x^2 + 8x + 4$
4-1	$6x^2 + 5x - 4$	4-2	$12x^2 + 17x - 5$
5-1	$-5x^2 + 28xy + 12y^2$	5-2	$6x^2 + xy - 2y^2$

$$\begin{aligned}
 1-2 & (-x-7)(2x+3) \\
 & = \{(-1) \times 2\}x^2 + \{(-1) \times 3 + (-7) \times 2\}x + (-7) \times 3 \\
 & = -2x^2 - 17x - 21
 \end{aligned}$$

$$\begin{aligned}
 2-1 & (3x+5)(-2x-1) \\
 & = \{3 \times (-2)\}x^2 + \{3 \times (-1) + 5 \times (-2)\}x + 5 \times (-1) \\
 & = -6x^2 - 13x - 5
 \end{aligned}$$

$$\begin{aligned}
 2-2 & (5x+3)(-2x+3) \\
 & = \{5 \times (-2)\}x^2 + \{5 \times 3 + 3 \times (-2)\}x + 3 \times 3 \\
 & = -10x^2 + 9x + 9
 \end{aligned}$$

$$\begin{aligned}
 3-1 & (-2x+5)(3x-2) \\
 & = \{(-2) \times 3\}x^2 + \{(-2) \times (-2) + 5 \times 3\}x + 5 \times (-2) \\
 & = -6x^2 + 19x - 10
 \end{aligned}$$

$$\begin{aligned}
 3-2 & (7x+2)(-3x+2) \\
 & = \{7 \times (-3)\}x^2 + \{7 \times 2 + 2 \times (-3)\}x + 2 \times 2 \\
 & = -21x^2 + 8x + 4
 \end{aligned}$$

$$\begin{aligned}
 4-1 & (-2x+1)(-3x-4) \\
 & = \{(-2) \times (-3)\}x^2 + \{(-2) \times (-4) + 1 \times (-3)\}x \\
 & \quad + 1 \times (-4) \\
 & = 6x^2 + 5x - 4
 \end{aligned}$$

$$\begin{aligned}
 4-2 & (-4x+1)(-3x-5) \\
 & = \{(-4) \times (-3)\}x^2 + \{(-4) \times (-5) + 1 \times (-3)\}x \\
 & \quad + 1 \times (-5) \\
 & = 12x^2 + 17x - 5
 \end{aligned}$$

$$\begin{aligned}
 5-1 & (-5x-2y)(x-6y) \\
 & = \{(-5) \times 1\}x^2 + \{(-5) \times (-6y) + (-2y) \times 1\}x \\
 & \quad + (-2y) \times (-6y) \\
 & = -5x^2 + 28xy + 12y^2
 \end{aligned}$$

$$\begin{aligned}
 5-2 & (-2x+y)(-3x-2y) \\
 & = \{(-2) \times (-3)\}x^2 + \{(-2) \times (-2y) + y \times (-3)\}x \\
 & \quad + y \times (-2y) \\
 & = 6x^2 + xy - 2y^2
 \end{aligned}$$

09 복잡한 식의 전개

p. 108 ~ p. 109

1-1	-21	1-2	$4x^2 - 10$
2-1	$2x^2 - 3x + 16$	2-2	$2x^2 - 5x - 8$
3-1	$-6x + 9$	3-2	$2x^2 - 5x - 22$
4-1	$12x$	4-2	$2x^2 + 3x - 41$
5-1	$2x^2 + 18x - 5$	5-2	$-8x^2 - 15x + 6$
6-1	$2x^2 - 5x - 5$	6-2	$13x - 9$
7-1	$6x^2 - 13x + 2$	7-2	$7x - 8$
8-1	$2x^2 + 8xy - 9y^2$	8-2	$-12xy$
9-1	$-3y^2 + 3xy$	9-2	$-y^2 - 5xy$

$$\begin{aligned}
 1-1 & (x+3)(x-7) - x(x-4) = x^2 - 4x - 21 - (x^2 - 4x) \\
 & = x^2 - 4x - 21 - x^2 + 4x \\
 & = -21
 \end{aligned}$$

$$\begin{aligned}
 1-2 & (x-5)(x+2) + 3x(x+1) = x^2 - 3x - 10 + 3x^2 + 3x \\
 & = 4x^2 - 10
 \end{aligned}$$

$$\begin{aligned}
 2-1 & (x+2)^2 + (x-4)(x-3) = x^2 + 4x + 4 + x^2 - 7x + 12 \\
 & = 2x^2 - 3x + 16
 \end{aligned}$$

$$\begin{aligned}
 2-2 & (x-2)^2 + (x-4)(x+3) = x^2 - 4x + 4 + x^2 - x - 12 \\
 & = 2x^2 - 5x - 8
 \end{aligned}$$

$$\begin{aligned}
 3-1 & (x-1)(x-5) - (x+2)(x-2) = x^2 - 6x + 5 - (x^2 - 4) \\
 & = x^2 - 6x + 5 - x^2 + 4 \\
 & = -6x + 9
 \end{aligned}$$

$$\begin{aligned}
 3-2 & (x+1)(x-6) + (x-4)(x+4) \\
 & = x^2 - 5x - 6 + x^2 - 16 \\
 & = 2x^2 - 5x - 22
 \end{aligned}$$

$$\begin{aligned}
 4-1 & (x+3)^2 - (x-3)^2 = x^2 + 6x + 9 - (x^2 - 6x + 9) \\
 & = x^2 + 6x + 9 - x^2 + 6x - 9 \\
 & = 12x
 \end{aligned}$$

$$\begin{aligned}
 4-2 & (-x-1)(-x+1)+(x-5)(x+8) \\
 & =x^2-1+x^2+3x-40 \\
 & =2x^2+3x-41
 \end{aligned}$$

$$\begin{aligned}
 5-1 & (2x+1)(4x+1)-6(x-1)^2 \\
 & =8x^2+6x+1-6(x^2-2x+1) \\
 & =8x^2+6x+1-6x^2+12x-6 \\
 & =2x^2+18x-5
 \end{aligned}$$

$$\begin{aligned}
 5-2 & (2x-1)^2-(3x-1)(4x+5) \\
 & =4x^2-4x+1-(12x^2+11x-5) \\
 & =4x^2-4x+1-12x^2-11x+5 \\
 & =-8x^2-15x+6
 \end{aligned}$$

$$\begin{aligned}
 6-1 & (2x-3)(3x+2)-(2x+1)(2x-1) \\
 & =6x^2-5x-6-(4x^2-1) \\
 & =6x^2-5x-6-4x^2+1 \\
 & =2x^2-5x-5
 \end{aligned}$$

$$\begin{aligned}
 6-2 & (3x-2)(4x+3)-3(-2x+1)^2 \\
 & =12x^2+x-6-3(4x^2-4x+1) \\
 & =12x^2+x-6-12x^2+12x-3 \\
 & =13x-9
 \end{aligned}$$

$$\begin{aligned}
 7-1 & (-4x-3)^2+(-2x-7)(5x+1) \\
 & =16x^2+24x+9-10x^2-37x-7 \\
 & =6x^2-13x+2
 \end{aligned}$$

$$\begin{aligned}
 7-2 & (-2x+1)(3x-2)-6(-x+1)(x+1) \\
 & =-6x^2+7x-2-6(1-x^2) \\
 & =-6x^2+7x-2-6+6x^2 \\
 & =7x-8
 \end{aligned}$$

$$\begin{aligned}
 8-1 & (2x+y)(2x-y)-2(x-2y)^2 \\
 & =4x^2-y^2-2(x^2-4xy+4y^2) \\
 & =4x^2-y^2-2x^2+8xy-8y^2 \\
 & =2x^2+8xy-9y^2
 \end{aligned}$$

$$\begin{aligned}
 8-2 & (x-3y)^2-(x+3y)^2 \\
 & =x^2-6xy+9y^2-(x^2+6xy+9y^2) \\
 & =x^2-6xy+9y^2-x^2-6xy-9y^2 \\
 & =-12xy
 \end{aligned}$$

$$\begin{aligned}
 9-1 & (x-y)(x+4y)-(-x-y)(-x+y) \\
 & =x^2+3xy-4y^2-(x^2-y^2) \\
 & =x^2+3xy-4y^2-x^2+y^2 \\
 & =-3y^2+3xy
 \end{aligned}$$

$$\begin{aligned}
 9-2 & 4(x-y)(x-5y)+(-4x+7y)(x-3y) \\
 & =4(x^2-6xy+5y^2)-4x^2+19xy-21y^2 \\
 & =4x^2-24xy+20y^2-4x^2+19xy-21y^2 \\
 & =-y^2-5xy
 \end{aligned}$$

STEP 2

기본연산 집중연습 | 05~09

p. 110 ~ p. 111

$$1-1 \quad \times, x^2+x-6$$

$$1-2 \quad \times, x^2-xy-2y^2$$

$$1-3 \quad \times, 6x^2+x-1$$

$$1-4 \quad \times, 12x^2+7xy+y^2$$

$$2-1 \quad x^2-3x-4$$

$$2-2 \quad x^2-16x+63$$

$$2-3 \quad x^2+2xy-15y^2$$

$$2-4 \quad 8x^2+22xy+15y^2$$

$$2-5 \quad 25x^2-25x+6$$

$$2-6 \quad 15x^2-7xy-2y^2$$

$$2-7 \quad -4x^2+19xy-21y^2$$

$$2-8 \quad 3x^2+7xy+4y^2$$

3	(1) 3					(6) -	(5) 4	x	y
	(2) x ²	-	(3) 4	9			x ²		
	-		(4) x ²	+	2	x	-	8	
	3		-				8		
	x		9		(7) -	2	x	+	(8) 6
		(9) 4	y ²	-	(10) 9		y		x
					a ²		+		-
	(11) 3	x ²	-	x	-	1	3		5
					1		y ²		

$$\begin{aligned}
 3 \quad (1) & (x+2)^2+(2x+1)(x-4) \\
 & =x^2+4x+4+2x^2-7x-4 \\
 & =3x^2-3x
 \end{aligned}$$

$$\begin{aligned}
 (6) & (x-y)^2-(x+y)^2=x^2-2xy+y^2-(x^2+2xy+y^2) \\
 & =x^2-2xy+y^2-x^2-2xy-y^2 \\
 & =-4xy
 \end{aligned}$$

$$\begin{aligned}
 (7) & (x+1)(x-3)-(x-3)(x+3) \\
 & =x^2-2x-3-(x^2-9) \\
 & =x^2-2x-3-x^2+9 \\
 & =-2x+6
 \end{aligned}$$

$$\begin{aligned}
 (8) & (3x+2)(3x-2)-(3x-1)^2 \\
 & =9x^2-4-(9x^2-6x+1) \\
 & =9x^2-4-9x^2+6x-1 \\
 & =6x-5
 \end{aligned}$$

$$\begin{aligned}
 (9) & (y-1)(y+9)+y(3y-8)=y^2+8y-9+3y^2-8y \\
 & =4y^2-9
 \end{aligned}$$

$$\begin{aligned}
 (11) & (2x+3)^2-(x+2)(x+11) \\
 & =4x^2+12x+9-(x^2+13x+22) \\
 & =4x^2+12x+9-x^2-13x-22 \\
 & =3x^2-x-13
 \end{aligned}$$

STEP 1

10 곱셈 공식을 이용한 무리수의 계산 (1)

p. 112

$$1-1 \quad \sqrt{5}, 8+2\sqrt{15}$$

$$1-2 \quad 3+2\sqrt{2}$$

$$2-1 \quad 37+20\sqrt{3}$$

$$2-2 \quad 9-2\sqrt{14}$$

$$3-1 \quad 10-4\sqrt{6}$$

$$3-2 \quad 34-6\sqrt{21}$$

$$4-1 \quad \sqrt{3}, 2$$

$$4-2 \quad 2$$

$$5-1 \quad 1$$

$$5-2 \quad -2$$

$$1-2 \quad (\sqrt{2}+1)^2 = (\sqrt{2})^2 + 2 \times \sqrt{2} \times 1 + 1^2 \\ = 2 + 2\sqrt{2} + 1 = 3 + 2\sqrt{2}$$

$$2-1 \quad (2\sqrt{3}+5)^2 = (2\sqrt{3})^2 + 2 \times 2\sqrt{3} \times 5 + 5^2 \\ = 12 + 20\sqrt{3} + 25 = 37 + 20\sqrt{3}$$

$$2-2 \quad (\sqrt{7}-\sqrt{2})^2 = (\sqrt{7})^2 - 2 \times \sqrt{7} \times \sqrt{2} + (\sqrt{2})^2 \\ = 7 - 2\sqrt{14} + 2 = 9 - 2\sqrt{14}$$

$$3-1 \quad (\sqrt{6}-2)^2 = (\sqrt{6})^2 - 2 \times \sqrt{6} \times 2 + 2^2 \\ = 6 - 4\sqrt{6} + 4 = 10 - 4\sqrt{6}$$

$$3-2 \quad (3\sqrt{3}-\sqrt{7})^2 = (3\sqrt{3})^2 - 2 \times 3\sqrt{3} \times \sqrt{7} + (\sqrt{7})^2 \\ = 27 - 6\sqrt{21} + 7 = 34 - 6\sqrt{21}$$

$$4-2 \quad (\sqrt{5}+\sqrt{3})(\sqrt{5}-\sqrt{3}) = (\sqrt{5})^2 - (\sqrt{3})^2 = 5 - 3 = 2$$

$$5-1 \quad (3+2\sqrt{2})(3-2\sqrt{2}) = 3^2 - (2\sqrt{2})^2 = 9 - 8 = 1$$

$$5-2 \quad (-\sqrt{5}+\sqrt{7})(-\sqrt{5}-\sqrt{7}) = (-\sqrt{5})^2 - (\sqrt{7})^2 \\ = 5 - 7 = -2$$

11 곱셈 공식을 이용한 무리수의 계산 (2)

p. 113

$$1-1 \quad 3, 3, 11+5\sqrt{5}$$

$$1-2 \quad -4+3\sqrt{6}$$

$$2-1 \quad -8+2\sqrt{7}$$

$$2-2 \quad -14-2\sqrt{10}$$

$$3-1 \quad -14-3\sqrt{3}$$

$$3-2 \quad 30-13\sqrt{6}$$

$$4-1 \quad 6+2\sqrt{2}$$

$$4-2 \quad 35+18\sqrt{3}$$

$$5-1 \quad 1-\sqrt{10}$$

$$5-2 \quad 12-5\sqrt{6}$$

$$1-2 \quad (\sqrt{6}+5)(\sqrt{6}-2) = (\sqrt{6})^2 + (5-2)\sqrt{6} + 5 \times (-2) \\ = 6 + 3\sqrt{6} - 10 = -4 + 3\sqrt{6}$$

$$2-1 \quad (\sqrt{7}-3)(\sqrt{7}+5) = (\sqrt{7})^2 + (-3+5)\sqrt{7} + (-3) \times 5 \\ = 7 + 2\sqrt{7} - 15 = -8 + 2\sqrt{7}$$

$$2-2 \quad (\sqrt{10}+4)(\sqrt{10}-6) = (\sqrt{10})^2 + (4-6)\sqrt{10} + 4 \times (-6) \\ = 10 - 2\sqrt{10} - 24 = -14 - 2\sqrt{10}$$

$$3-1 \quad (2\sqrt{3}+5)(\sqrt{3}-4) = 2 \times (\sqrt{3})^2 + (-8+5)\sqrt{3} + 5 \times (-4) \\ = 6 - 3\sqrt{3} - 20 = -14 - 3\sqrt{3}$$

$$3-2 \quad (2\sqrt{6}-9)(\sqrt{6}-2) \\ = 2 \times (\sqrt{6})^2 + (-4-9)\sqrt{6} + (-9) \times (-2) \\ = 12 - 13\sqrt{6} + 18 = 30 - 13\sqrt{6}$$

$$4-1 \quad (2\sqrt{2}-1)(2\sqrt{2}+2) = 4 \times (\sqrt{2})^2 + (4-2)\sqrt{2} + (-1) \times 2 \\ = 8 + 2\sqrt{2} - 2 = 6 + 2\sqrt{2}$$

$$4-2 \quad (3\sqrt{3}+2)(3\sqrt{3}+4) = 9 \times (\sqrt{3})^2 + (12+6)\sqrt{3} + 2 \times 4 \\ = 27 + 18\sqrt{3} + 8 = 35 + 18\sqrt{3}$$

$$5-1 \quad (\sqrt{5}+\sqrt{2})(\sqrt{5}-2\sqrt{2}) \\ = (\sqrt{5})^2 + (\sqrt{2}-2\sqrt{2})\sqrt{5} + \sqrt{2} \times (-2\sqrt{2}) \\ = 5 - \sqrt{10} - 4 = 1 - \sqrt{10}$$

$$5-2 \quad (3\sqrt{2}-2\sqrt{3})(\sqrt{2}-\sqrt{3}) \\ = 3 \times (\sqrt{2})^2 + (-3\sqrt{3}-2\sqrt{3})\sqrt{2} + (-2\sqrt{3}) \times (-\sqrt{3}) \\ = 6 - 5\sqrt{6} + 6 = 12 - 5\sqrt{6}$$

12 곱셈 공식을 이용한 분모의 유리화

p. 114 ~ p. 115

$$1-1 \quad \sqrt{2}+1, \sqrt{2}+1$$

$$1-2 \quad \frac{\sqrt{3}-1}{2}$$

$$2-1 \quad -3-2\sqrt{3}$$

$$2-2 \quad \frac{\sqrt{10}-\sqrt{2}}{4}$$

$$3-1 \quad -2\sqrt{2}+3$$

$$3-2 \quad \frac{2\sqrt{3}+1}{11}$$

$$4-1 \quad \sqrt{5}+\sqrt{2}$$

$$4-2 \quad -2\sqrt{3}+2\sqrt{5}$$

$$5-1 \quad (\sqrt{3}+\sqrt{2})^2, \sqrt{3}+\sqrt{2}, 5+2\sqrt{6}$$

$$5-2 \quad 9+4\sqrt{5}$$

$$6-1 \quad 3+2\sqrt{2}$$

$$6-2 \quad 5+2\sqrt{6}$$

$$7-1 \quad \frac{5+\sqrt{21}}{2}$$

$$7-2 \quad 9-4\sqrt{5}$$

$$8-1 \quad \frac{3+\sqrt{3}}{3}$$

$$8-2 \quad -\sqrt{3}+2\sqrt{2}$$

$$9-1 \quad 10-7\sqrt{2}$$

$$9-2 \quad 14+8\sqrt{3}$$

$$1-2 \quad \frac{1}{\sqrt{3}+1} = \frac{\sqrt{3}-1}{(\sqrt{3}+1)(\sqrt{3}-1)} = \frac{\sqrt{3}-1}{2}$$

$$2-1 \quad \frac{\sqrt{3}}{\sqrt{3}-2} = \frac{\sqrt{3}(\sqrt{3}+2)}{(\sqrt{3}-2)(\sqrt{3}+2)} = \frac{3+2\sqrt{3}}{-1} = -3-2\sqrt{3}$$

$$\begin{aligned}
2-2 \quad & \frac{\sqrt{2}}{\sqrt{5}+1} = \frac{\sqrt{2}(\sqrt{5}-1)}{(\sqrt{5}+1)(\sqrt{5}-1)} = \frac{\sqrt{10}-\sqrt{2}}{4} \\
3-1 \quad & \frac{1}{2\sqrt{2}+3} = \frac{2\sqrt{2}-3}{(2\sqrt{2}+3)(2\sqrt{2}-3)} = \frac{2\sqrt{2}-3}{-1} = -2\sqrt{2}+3 \\
3-2 \quad & \frac{1}{2\sqrt{3}-1} = \frac{2\sqrt{3}+1}{(2\sqrt{3}-1)(2\sqrt{3}+1)} = \frac{2\sqrt{3}+1}{11} \\
4-1 \quad & \frac{3}{\sqrt{5}-\sqrt{2}} = \frac{3(\sqrt{5}+\sqrt{2})}{(\sqrt{5}-\sqrt{2})(\sqrt{5}+\sqrt{2})} \\
& = \frac{3(\sqrt{5}+\sqrt{2})}{3} = \sqrt{5}+\sqrt{2} \\
4-2 \quad & \frac{4}{\sqrt{3}+\sqrt{5}} = \frac{4(\sqrt{3}-\sqrt{5})}{(\sqrt{3}+\sqrt{5})(\sqrt{3}-\sqrt{5})} = \frac{4(\sqrt{3}-\sqrt{5})}{-2} \\
& = -2(\sqrt{3}-\sqrt{5}) = -2\sqrt{3}+2\sqrt{5} \\
5-2 \quad & \frac{\sqrt{5}+2}{\sqrt{5}-2} = \frac{(\sqrt{5}+2)^2}{(\sqrt{5}-2)(\sqrt{5}+2)} \\
& = (\sqrt{5})^2 + 2 \times \sqrt{5} \times 2 + 2^2 \\
& = 9 + 4\sqrt{5} \\
6-1 \quad & \frac{\sqrt{2}+1}{\sqrt{2}-1} = \frac{(\sqrt{2}+1)^2}{(\sqrt{2}-1)(\sqrt{2}+1)} \\
& = (\sqrt{2})^2 + 2 \times \sqrt{2} \times 1 + 1^2 \\
& = 3 + 2\sqrt{2} \\
6-2 \quad & \frac{\sqrt{6}+2}{\sqrt{6}-2} = \frac{(\sqrt{6}+2)^2}{(\sqrt{6}-2)(\sqrt{6}+2)} \\
& = \frac{(\sqrt{6})^2 + 2 \times \sqrt{6} \times 2 + 2^2}{2} \\
& = \frac{10 + 4\sqrt{6}}{2} = 5 + 2\sqrt{6} \\
7-1 \quad & \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}-\sqrt{3}} = \frac{(\sqrt{7}+\sqrt{3})^2}{(\sqrt{7}-\sqrt{3})(\sqrt{7}+\sqrt{3})} \\
& = \frac{(\sqrt{7})^2 + 2 \times \sqrt{7} \times \sqrt{3} + (\sqrt{3})^2}{4} \\
& = \frac{10 + 2\sqrt{21}}{4} = \frac{5 + \sqrt{21}}{2} \\
7-2 \quad & \frac{\sqrt{10}-\sqrt{8}}{\sqrt{10}+\sqrt{8}} = \frac{(\sqrt{10}-\sqrt{8})^2}{(\sqrt{10}+\sqrt{8})(\sqrt{10}-\sqrt{8})} \\
& = \frac{(\sqrt{10})^2 - 2 \times \sqrt{10} \times \sqrt{8} + (\sqrt{8})^2}{2} \\
& = \frac{18 - 8\sqrt{5}}{2} = 9 - 4\sqrt{5} \\
8-1 \quad & \frac{\sqrt{3}-1}{2\sqrt{3}-3} = \frac{(\sqrt{3}-1)(2\sqrt{3}+3)}{(2\sqrt{3}-3)(2\sqrt{3}+3)} \\
& = \frac{6 + \sqrt{3} - 3}{3} = \frac{3 + \sqrt{3}}{3}
\end{aligned}$$

$$\begin{aligned}
8-2 \quad & \frac{\sqrt{6}+1}{\sqrt{2}+\sqrt{3}} = \frac{(\sqrt{6}+1)(\sqrt{2}-\sqrt{3})}{(\sqrt{2}+\sqrt{3})(\sqrt{2}-\sqrt{3})} \\
& = \frac{\sqrt{12}-\sqrt{18}+\sqrt{2}-\sqrt{3}}{-1} \\
& = -(2\sqrt{3}-3\sqrt{2}+\sqrt{2}-\sqrt{3}) \\
& = -\sqrt{3}+2\sqrt{2} \\
9-1 \quad & \frac{2-\sqrt{2}}{3+2\sqrt{2}} = \frac{(2-\sqrt{2})(3-2\sqrt{2})}{(3+2\sqrt{2})(3-2\sqrt{2})} \\
& = 6 - 4\sqrt{2} - 3\sqrt{2} + 4 \\
& = 10 - 7\sqrt{2} \\
9-2 \quad & \frac{4+2\sqrt{3}}{2-\sqrt{3}} = \frac{(4+2\sqrt{3})(2+\sqrt{3})}{(2-\sqrt{3})(2+\sqrt{3})} \\
& = 8 + 4\sqrt{3} + 4\sqrt{3} + 6 \\
& = 14 + 8\sqrt{3}
\end{aligned}$$

13 곱셈 공식을 이용한 수의 계산 (1)

p. 116

1-1	2, 1, 2601	1-2	10201
2-1	5184	2-2	8281
3-1	2, 2, 2304	3-2	9025
4-1	7569	4-2	159201
5-1	37.21	5-2	94.09

$$\begin{aligned}
1-2 \quad & 101^2 = (100+1)^2 = 100^2 + 2 \times 100 \times 1 + 1^2 \\
& = 10000 + 200 + 1 = 10201 \\
2-1 \quad & 72^2 = (70+2)^2 = 70^2 + 2 \times 70 \times 2 + 2^2 \\
& = 4900 + 280 + 4 = 5184 \\
2-2 \quad & 91^2 = (90+1)^2 = 90^2 + 2 \times 90 \times 1 + 1^2 \\
& = 8100 + 180 + 1 = 8281 \\
3-2 \quad & 95^2 = (100-5)^2 = 100^2 - 2 \times 100 \times 5 + 5^2 \\
& = 10000 - 1000 + 25 = 9025 \\
4-1 \quad & 87^2 = (90-3)^2 = 90^2 - 2 \times 90 \times 3 + 3^2 \\
& = 8100 - 540 + 9 = 7569 \\
4-2 \quad & 399^2 = (400-1)^2 = 400^2 - 2 \times 400 \times 1 + 1^2 \\
& = 160000 - 800 + 1 = 159201 \\
5-1 \quad & 6.1^2 = (6+0.1)^2 = 6^2 + 2 \times 6 \times 0.1 + 0.1^2 \\
& = 36 + 1.2 + 0.01 = 37.21 \\
5-2 \quad & 9.7^2 = (10-0.3)^2 = 10^2 - 2 \times 10 \times 0.3 + 0.3^2 \\
& = 100 - 6 + 0.09 = 94.09
\end{aligned}$$

14 곱셈 공식을 이용한 수의 계산 (2)

p. 117

1-1	2, 2, 2496	1-2	896
2-1	9991	2-2	39996
3-1	99.96	3-2	24.99
4-1	8, 8, 8, 11124	4-2	253510
5-1	10282	5-2	38612

$$\begin{aligned} 1-2 \quad 28 \times 32 &= (30-2)(30+2) = 30^2 - 2^2 \\ &= 900 - 4 = 896 \end{aligned}$$

$$\begin{aligned} 2-1 \quad 97 \times 103 &= (100-3)(100+3) = 100^2 - 3^2 \\ &= 10000 - 9 = 9991 \end{aligned}$$

$$\begin{aligned} 2-2 \quad 202 \times 198 &= (200+2)(200-2) = 200^2 - 2^2 \\ &= 40000 - 4 = 39996 \end{aligned}$$

$$\begin{aligned} 3-1 \quad 10.2 \times 9.8 &= (10+0.2)(10-0.2) = 10^2 - 0.2^2 \\ &= 100 - 0.04 = 99.96 \end{aligned}$$

$$\begin{aligned} 3-2 \quad 4.9 \times 5.1 &= (5-0.1)(5+0.1) = 5^2 - 0.1^2 \\ &= 25 - 0.01 = 24.99 \end{aligned}$$

$$\begin{aligned} 4-2 \quad 502 \times 505 &= (500+2)(500+5) \\ &= 500^2 + (2+5) \times 500 + 2 \times 5 \\ &= 250000 + 3500 + 10 = 253510 \end{aligned}$$

$$\begin{aligned} 5-1 \quad 97 \times 106 &= (100-3)(100+6) \\ &= 100^2 + (-3+6) \times 100 + (-3) \times 6 \\ &= 10000 + 300 - 18 = 10282 \end{aligned}$$

$$\begin{aligned} 5-2 \quad 196 \times 197 &= (200-4)(200-3) \\ &= 200^2 + (-4-3) \times 200 + (-4) \times (-3) \\ &= 40000 - 1400 + 12 = 38612 \end{aligned}$$

15 치환을 이용한 다항식의 전개

p. 118 ~ p. 119

$$1-1 \quad a+b, 9, a^2+2ab+b^2-9$$

$$1-2 \quad x^2-2xy+y^2-4$$

$$2-1 \quad x^2+2xy+y^2-7x-7y+10$$

$$2-2 \quad x^2+4xy+4y^2+5x+10y+6$$

$$3-1 \quad 4x^2+4xy+y^2-16x-8y+15$$

$$3-2 \quad 9x^2+6xy+y^2+3x+y-2$$

$$4-1 \quad x^2+2x+1-9y^2 \quad \text{연구} \quad 1, 1$$

$$4-2 \quad a^2-4a+4-b^2$$

$$5-1 \quad 2, x+y, x^2+2xy+y^2-2x-2y+1$$

$$5-2 \quad a^2-2ab+b^2+4a-4b+4$$

$$6-1 \quad a^2+4ab+4b^2-2a-4b+1$$

$$6-2 \quad 4x^2+12xy+9y^2+4x+6y+1$$

$$7-1 \quad 4x^2+4xy+y^2-12x-6y+9$$

$$7-2 \quad a^2-8ab+16b^2+10a-40b+25$$

$$8-1 \quad y-1, x^2-y^2+2y-1 \quad 8-2 \quad x^2-4y^2+12y-9$$

$$9-1 \quad x^2-9y^2+24y-16 \quad 9-2 \quad a^2-b^2+8b-16$$

$$\begin{aligned} 1-2 \quad & (x-y+2)(x-y-2) \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} x-y=A \text{로 치환} \\ &= (A+2)(A-2) \\ &= A^2-4 \\ &= (x-y)^2-4 \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} A=x-y \text{를 대입} \\ &= x^2-2xy+y^2-4 \end{aligned}$$

$$\begin{aligned} 2-1 \quad & (x+y-2)(x+y-5) \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} x+y=A \text{로 치환} \\ &= (A-2)(A-5) \\ &= A^2-7A+10 \\ &= (x+y)^2-7(x+y)+10 \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} A=x+y \text{를 대입} \\ &= x^2+2xy+y^2-7x-7y+10 \end{aligned}$$

$$\begin{aligned} 2-2 \quad & (x+2y+3)(x+2y+2) \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} x+2y=A \text{로 치환} \\ &= (A+3)(A+2) \\ &= A^2+5A+6 \\ &= (x+2y)^2+5(x+2y)+6 \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} A=x+2y \text{를 대입} \\ &= x^2+4xy+4y^2+5x+10y+6 \end{aligned}$$

$$\begin{aligned} 3-1 \quad & (2x+y-3)(2x+y-5) \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} 2x+y=A \text{로 치환} \\ &= (A-3)(A-5) \\ &= A^2-8A+15 \\ &= (2x+y)^2-8(2x+y)+15 \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} A=2x+y \text{를 대입} \\ &= 4x^2+4xy+y^2-16x-8y+15 \end{aligned}$$

$$\begin{aligned} 3-2 \quad & (3x+y-1)(3x+y+2) \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} 3x+y=A \text{로 치환} \\ &= (A-1)(A+2) \\ &= A^2+A-2 \\ &= (3x+y)^2+(3x+y)-2 \quad \left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\} A=3x+y \text{를 대입} \\ &= 9x^2+6xy+y^2+3x+y-2 \end{aligned}$$

$$\begin{aligned}
 & \text{4-1 } (x-3y+1)(x+3y+1) \\
 &= (x+1-3y)(x+1+3y) \quad \leftarrow x+1=A \text{로 치환} \\
 &= (A-3y)(A+3y) \\
 &= A^2-9y^2 \quad \leftarrow A=x+1 \text{을 대입} \\
 &= (x+1)^2-9y^2 \\
 &= x^2+2x+1-9y^2
 \end{aligned}$$

$$\begin{aligned}
 & \text{4-2 } (a+b-2)(a-b-2) \\
 &= (a-2+b)(a-2-b) \quad \leftarrow a-2=A \text{로 치환} \\
 &= (A+b)(A-b) \\
 &= A^2-b^2 \\
 &= (a-2)^2-b^2 \quad \leftarrow A=a-2 \text{를 대입} \\
 &= a^2-4a+4-b^2
 \end{aligned}$$

$$\begin{aligned}
 & \text{5-2 } (a-b+2)^2 \quad \leftarrow a-b=A \text{로 치환} \\
 &= (A+2)^2 \\
 &= A^2+4A+4 \\
 &= (a-b)^2+4(a-b)+4 \quad \leftarrow A=a-b \text{를 대입} \\
 &= a^2-2ab+b^2+4a-4b+4
 \end{aligned}$$

$$\begin{aligned}
 & \text{6-1 } (a+2b-1)^2 \quad \leftarrow a+2b=A \text{로 치환} \\
 &= (A-1)^2 \\
 &= A^2-2A+1 \\
 &= (a+2b)^2-2(a+2b)+1 \quad \leftarrow A=a+2b \text{를 대입} \\
 &= a^2+4ab+4b^2-2a-4b+1
 \end{aligned}$$

$$\begin{aligned}
 & \text{6-2 } (2x+3y+1)^2 \quad \leftarrow 2x+3y=A \text{로 치환} \\
 &= (A+1)^2 \\
 &= A^2+2A+1 \\
 &= (2x+3y)^2+2(2x+3y)+1 \quad \leftarrow A=2x+3y \text{를 대입} \\
 &= 4x^2+12xy+9y^2+4x+6y+1
 \end{aligned}$$

$$\begin{aligned}
 & \text{7-1 } (2x+y-3)^2 \quad \leftarrow 2x+y=A \text{로 치환} \\
 &= (A-3)^2 \\
 &= A^2-6A+9 \\
 &= (2x+y)^2-6(2x+y)+9 \quad \leftarrow A=2x+y \text{를 대입} \\
 &= 4x^2+4xy+y^2-12x-6y+9
 \end{aligned}$$

$$\begin{aligned}
 & \text{7-2 } (a-4b+5)^2 \quad \leftarrow a-4b=A \text{로 치환} \\
 &= (A+5)^2 \\
 &= A^2+10A+25 \\
 &= (a-4b)^2+10(a-4b)+25 \quad \leftarrow A=a-4b \text{를 대입} \\
 &= a^2-8ab+16b^2+10a-40b+25
 \end{aligned}$$

$$\begin{aligned}
 & \text{8-2 } (x-2y+3)(x+2y-3) \\
 &= \{x-(2y-3)\} \{x+(2y-3)\} \quad \leftarrow 2y-3=A \text{로 치환} \\
 &= (x-A)(x+A) \\
 &= x^2-A^2 \\
 &= x^2-(2y-3)^2 \quad \leftarrow A=2y-3 \text{을 대입} \\
 &= x^2-(4y^2-12y+9) \\
 &= x^2-4y^2+12y-9
 \end{aligned}$$

$$\begin{aligned}
 & \text{9-1 } (x+3y-4)(x-3y+4) \\
 &= \{x+(3y-4)\} \{x-(3y-4)\} \quad \leftarrow 3y-4=A \text{로 치환} \\
 &= (x+A)(x-A) \\
 &= x^2-A^2 \\
 &= x^2-(3y-4)^2 \quad \leftarrow A=3y-4 \text{를 대입} \\
 &= x^2-(9y^2-24y+16) \\
 &= x^2-9y^2+24y-16
 \end{aligned}$$

$$\begin{aligned}
 & \text{9-2 } (a+b-4)(a-b+4) \\
 &= \{a+(b-4)\} \{a-(b-4)\} \quad \leftarrow b-4=A \text{로 치환} \\
 &= (a+A)(a-A) \\
 &= a^2-A^2 \\
 &= a^2-(b-4)^2 \quad \leftarrow A=b-4 \text{를 대입} \\
 &= a^2-(b^2-8b+16) \\
 &= a^2-b^2+8b-16
 \end{aligned}$$

STEP 2

기본연산 집중연습 | 10~15

p. 120 ~ p. 121

1-1	$14-6\sqrt{5}$	1-2	$9+6\sqrt{2}$
1-3	10	1-4	$-31-\sqrt{15}$
2-1	10609	2-2	9801
2-3	10605	2-4	3596
3-1	$x^2+2xy+y^2-5x-5y-14$		
3-2	$9x^2+12xy+4y^2-6x-4y+1$		
3-3	$4x^2+4xy+y^2-9$		
3-4	$x^2-6x+9-4y^2$		
4	24개		

$$\begin{aligned}
 \text{2-1 } 103^2 &= (100+3)^2 = 100^2 + 2 \times 100 \times 3 + 3^2 \\
 &= 10000 + 600 + 9 = 10609
 \end{aligned}$$

$$\begin{aligned}
 \text{2-2 } 99^2 &= (100-1)^2 = 100^2 - 2 \times 100 \times 1 + 1^2 \\
 &= 10000 - 200 + 1 = 9801
 \end{aligned}$$

2-3 $101 \times 105 = (100+1)(100+5)$
 $= 100^2 + (1+5) \times 100 + 1 \times 5$
 $= 10000 + 600 + 5 = 10605$

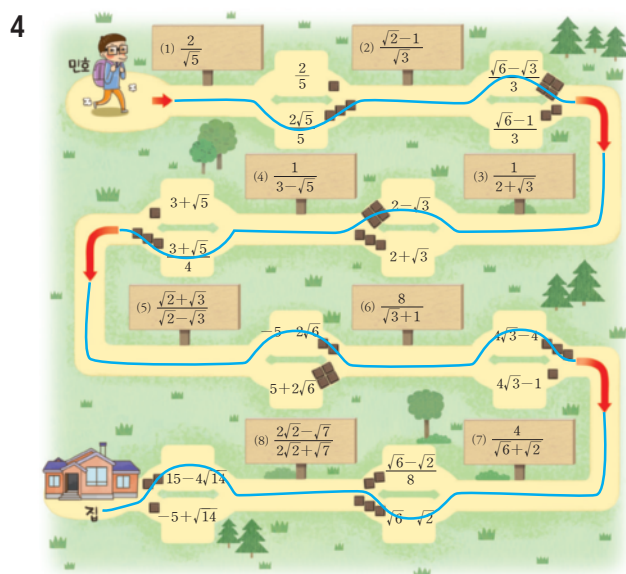
2-4 $62 \times 58 = (60+2)(60-2) = 60^2 - 2^2$
 $= 3600 - 4 = 3596$

3-1 $(x+y+2)(x+y-7)$ $\xrightarrow{x+y=A \text{로 치환}}$
 $= (A+2)(A-7)$
 $= A^2 - 5A - 14$
 $= (x+y)^2 - 5(x+y) - 14$ $\xrightarrow{A=x+y \text{를 대입}}$
 $= x^2 + 2xy + y^2 - 5x - 5y - 14$

3-2 $(3x+2y-1)^2$ $\xrightarrow{3x+2y=A \text{로 치환}}$
 $= (A-1)^2$
 $= A^2 - 2A + 1$
 $= (3x+2y)^2 - 2(3x+2y) + 1$ $\xrightarrow{A=3x+2y \text{를 대입}}$
 $= 9x^2 + 12xy + 4y^2 - 6x - 4y + 1$

3-3 $(2x+y-3)(2x+y+3)$ $\xrightarrow{2x+y=A \text{로 치환}}$
 $= (A-3)(A+3)$
 $= A^2 - 9$
 $= (2x+y)^2 - 9$ $\xrightarrow{A=2x+y \text{를 대입}}$
 $= 4x^2 + 4xy + y^2 - 9$

3-4 $(x+2y-3)(x-2y-3)$
 $= (x-3+2y)(x-3-2y)$ $\xrightarrow{x-3=A \text{로 치환}}$
 $= (A+2y)(A-2y)$
 $= A^2 - 4y^2$
 $= (x-3)^2 - 4y^2$ $\xrightarrow{A=x-3 \text{를 대입}}$
 $= x^2 - 6x + 9 - 4y^2$



STEP 3

기본연산 테스트

p. 122 ~ p. 123

- 1** (1) $x^2 + 4x + 4$ (2) $16x^2 + 8x + 1$
 (3) $x^2 + xy + \frac{1}{4}y^2$ (4) $x^2 - 12x + 36$
 (5) $9x^2 - 24x + 16$ (6) $x^2 - x + \frac{1}{4}$
 (7) $\frac{1}{16}x^2 - \frac{1}{2}x + 1$ (8) $9x^2 + 12xy + 4y^2$
- 2** (1) $x^2 - 49$ (2) $36x^2 - 25$
 (3) $4x^2 - 9$ (4) $4y^2 - x^2$
 (5) $\frac{1}{4}x^2 - \frac{9}{16}y^2$
- 3** (1) $x^2 + 7x + 10$ (2) $x^2 - 13xy + 36y^2$
 (3) $15x^2 + 59x + 56$ (4) $20x^2 + 13xy - 15y^2$
 (5) $-12x^2 - 5xy + 2y^2$
- 4** (1) \times (2) \times (3) \times (4) \bigcirc (5) \times
- 5** (1) $10 + 4\sqrt{6}$ (2) $12 - 2\sqrt{35}$ (3) -2
 (4) $12 + 5\sqrt{6}$ (5) $16 + \sqrt{6}$
- 6** (1) $-2\sqrt{3} + 2\sqrt{5}$ (2) $\frac{\sqrt{15}+3}{2}$
 (3) $-8 - 3\sqrt{7}$ (4) $10 + 7\sqrt{2}$
- 7** (1) $2\sqrt{2} - 2$ (2) $\sqrt{2} - 3$
- 8** (1) \ominus , 529 (2) \oplus , 10192
 (3) \oslash , 998001 (4) \odot , 6396
- 9** (1) $9x^2 - 9xy - 3y^2$ (2) $13x - 9$
 (3) $x^4 - 1$ (4) $a^2 - ab - 2b^2 + 2a - b + 1$
 (5) $a^2 - 4b^2 - 4b - 1$

6 (1) $\frac{4}{\sqrt{3}+\sqrt{5}} = \frac{4(\sqrt{3}-\sqrt{5})}{(\sqrt{3}+\sqrt{5})(\sqrt{3}-\sqrt{5})}$
 $= \frac{4(\sqrt{3}-\sqrt{5})}{-2} = -2\sqrt{3} + 2\sqrt{5}$
 (2) $\frac{\sqrt{6}}{\sqrt{10}-\sqrt{6}} = \frac{\sqrt{6}(\sqrt{10}+\sqrt{6})}{(\sqrt{10}-\sqrt{6})(\sqrt{10}+\sqrt{6})} = \frac{\sqrt{60}+6}{4}$
 $= \frac{2\sqrt{15}+6}{4} = \frac{\sqrt{15}+3}{2}$
 (3) $\frac{\sqrt{7}+3}{\sqrt{7}-3} = \frac{(\sqrt{7}+3)^2}{(\sqrt{7}-3)(\sqrt{7}+3)}$
 $= \frac{16+6\sqrt{7}}{-2} = -8-3\sqrt{7}$
 (4) $\frac{2+\sqrt{2}}{3-2\sqrt{2}} = \frac{(2+\sqrt{2})(3+2\sqrt{2})}{(3-2\sqrt{2})(3+2\sqrt{2})} = 10+7\sqrt{2}$

7 (1) $\frac{\sqrt{6}-2\sqrt{3}}{\sqrt{3}} + \frac{2-3\sqrt{2}}{\sqrt{2}-3}$
 $= \sqrt{2} - 2 + \frac{(2-3\sqrt{2})(\sqrt{2}+3)}{(\sqrt{2}-3)(\sqrt{2}+3)}$
 $= \sqrt{2} - 2 + \frac{2\sqrt{2}+6-6-9\sqrt{2}}{-7}$
 $= \sqrt{2} - 2 + \sqrt{2} = 2\sqrt{2} - 2$

$$\begin{aligned}
 (2) \quad & \frac{\sqrt{10}-\sqrt{5}}{\sqrt{5}} - \frac{2\sqrt{5}-4}{\sqrt{5}-2} \\
 &= \sqrt{2}-1 - \frac{(2\sqrt{5}-4)(\sqrt{5}+2)}{(\sqrt{5}-2)(\sqrt{5}+2)} \\
 &= \sqrt{2}-1 - (10+4\sqrt{5}-4\sqrt{5}-8) \\
 &= \sqrt{2}-3
 \end{aligned}$$

8 (1) $23^2 = (20+3)^2 = 20^2 + 2 \times 20 \times 3 + 3^2$
 $= 400 + 120 + 9 = 529$

(2) $98 \times 104 = (100-2)(100+4)$
 $= 100^2 + (-2+4) \times 100 + (-2) \times 4$
 $= 10000 + 200 - 8$
 $= 10192$

(3) $999^2 = (1000-1)^2 = 1000^2 - 2 \times 1000 \times 1 + 1^2$
 $= 1000000 - 2000 + 1 = 998001$

(4) $78 \times 82 = (80-2)(80+2) = 80^2 - 2^2$
 $= 6400 - 4 = 6396$

9 (1) $(2x+y)(5x-7y) - (x-2y)(x+2y)$
 $= 10x^2 - 9xy - 7y^2 - (x^2 - 4y^2)$
 $= 10x^2 - 9xy - 7y^2 - x^2 + 4y^2$
 $= 9x^2 - 9xy - 3y^2$

(2) $(3x-2)(4x+3) - 3(2x-1)^2$
 $= 12x^2 + x - 6 - 3(4x^2 - 4x + 1)$
 $= 12x^2 + x - 6 - 12x^2 + 12x - 3$
 $= 13x - 9$

(3) $(x-1)(x+1)(x^2+1) = (x^2-1)(x^2+1) = x^4 - 1$

(4) $(a+b+1)(a-2b+1)$
 $= (a+1+b)(a+1-2b)$
 $= (A+b)(A-2b)$ $\left[\begin{array}{l} a+1=A \text{로 치환} \\ \end{array} \right]$
 $= A^2 - bA - 2b^2$
 $= (a+1)^2 - b(a+1) - 2b^2$ $\left[\begin{array}{l} A=a+1 \text{을 대입} \\ \end{array} \right]$
 $= a^2 + 2a + 1 - ab - b - 2b^2$
 $= a^2 - ab - 2b^2 + 2a - b + 1$

(5) $(a+2b+1)(a-2b-1)$
 $= \{a+(2b+1)\} \{a-(2b+1)\}$
 $= (a+A)(a-A)$ $\left[\begin{array}{l} 2b+1=A \text{로 치환} \\ \end{array} \right]$
 $= a^2 - A^2$
 $= a^2 - (2b+1)^2$ $\left[\begin{array}{l} A=2b+1 \text{을 대입} \\ \end{array} \right]$
 $= a^2 - (4b^2 + 4b + 1)$
 $= a^2 - 4b^2 - 4b - 1$

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다항식의 인수분해

STEP 1

01 인수분해

p. 126

1-1	$a^2, 2a$	1-2	$-2x^2 + 6x$
2-1	$x^2 + 2xy + y^2$	2-2	$4x^2 - 4x + 1$
3-1	$x^2 - 4$	3-2	$9x^2 - 25$
4-1	$x^2 + 5x + 6$	4-2	$x^2 - 9x + 14$
5-1	$2x^2 - 11x + 5$	5-2	$-6x^2 + 13x - 6$

02 인수

p. 127

1-1	$3, x-1, x^2+x-2, 3(x-1)$ 연구 $x-1$
1-2	$1, x+1, x^2-1, x^2-x, x^3-x$
2-1	$1, x-y, a, (x-y)^2$
2-2	$a, ab, a^2+ab, ab(a+b)$
3-1	$1, x, x-y, x^2-xy$
3-2	$x+y, x^2-y^2, x-y$

1-2 $x(x-1)(x+1) = 1 \times \overbrace{x(x-1)(x+1)}^{x^3-x}$
 $= x \times \overbrace{(x-1)(x+1)}^{x^2-1}$
 $= \overbrace{x(x-1)}^{x^2-x} \times (x+1)$
 $= \overbrace{x(x+1)}^{x^2+x} \times (x-1)$

2-1 $a(x-y)^2 = 1 \times a(x-y)^2$
 $= a \times (x-y)^2$
 $= a(x-y) \times (x-y)$

2-2 $ab(a+b) = 1 \times ab(a+b)$
 $= ab \times (a+b)$
 $= \overbrace{a(a+b)}^{a^2+ab} \times b$
 $= b(a+b) \times a$

3-1 $x^2(x-y) = 1 \times x^2(x-y)$
 $= x^2 \times (x-y)$
 $= \overbrace{x \times x(x-y)}^{x^2-xy}$

3-2 $(x+y)(x-y) = 1 \times \overbrace{(x+y)(x-y)}^{x^2-y^2}$

- 1-1 $b+c$ 1-2 $2x(y+3z)$
 2-1 $2x(x-3y^2)$ 2-2 $5x(2x+5)$
 3-1 $5xy(x+2)$ 3-2 $4x^2y(2x-3y)$
 4-1 $x(a-b+c)$ 4-2 $x(4x-6x^2+5)$
 5-1 $xy(y-x+1)$ 5-2 $4x^2y(1+3xy-2y^2)$
 6-1 $a-4$ 6-2 $(a-b)(x+y)$
 7-1 $c(a+b-2)$ 7-2 $(1-a)^2$
 8-1 $(x+y)(1+x-3y)$ 8-2 $(a-b)(2-x-y)$
 9-1 $x-2y, x-2y$ 9-2 $(a-b)(x-y)$
 10-1 $(a-b)(4-x)$ 10-2 $x(1-y)$
 11-1 $(x-1)(y-1)$ 11-2 $(y-z)(x+1)$

$$1-2 \quad 2xy+6xz=2x \times y+2x \times 3z=2x(y+3z)$$

$$2-1 \quad 2x^2-6xy^2=2x \times x-2x \times 3y^2=2x(x-3y^2)$$

$$2-2 \quad 10x^2+25x=5x \times 2x+5x \times 5=5x(2x+5)$$

$$3-1 \quad 5x^2y+10xy=5xy \times x+5xy \times 2=5xy(x+2)$$

$$3-2 \quad 8x^3y-12x^2y^2=4x^2y \times 2x-4x^2y \times 3y=4x^2y(2x-3y)$$

$$4-1 \quad ax-bx+cx=x \times a-x \times b+x \times c=x(a-b+c)$$

$$4-2 \quad 4x^2-6x^3+5x=x \times 4x-x \times 6x^2+x \times 5 \\ =x(4x-6x^2+5)$$

$$5-1 \quad xy^2-x^2y+xy=xy \times y-xy \times x+xy \times 1 \\ =xy(y-x+1)$$

$$5-2 \quad 4x^2y+12x^3y^2-8x^2y^3 \\ =4x^2y \times 1+4x^2y \times 3xy-4x^2y \times 2y^2 \\ =4x^2y(1+3xy-2y^2)$$

$$6-2 \quad x(a-b)+y(a-b)=(a-b)(x+y)$$

$$7-1 \quad (a+b)c-2c=c(a+b-2)$$

$$7-2 \quad (1-a)-a(1-a)=(1-a) \times 1-(1-a) \times a \\ =(1-a)(1-a)=(1-a)^2$$

$$8-1 \quad (x+y)+(x-3y)(x+y) \\ =(x+y) \times 1+(x+y) \times (x-3y) \\ =(x+y)(1+x-3y)$$

$$8-2 \quad 2(a-b)-(x+y)(a-b)=(a-b)\{2-(x+y)\} \\ =(a-b)(2-x-y)$$

$$9-2 \quad x(a-b)+y(b-a)=x(a-b)-y(a-b) \\ =(a-b)(x-y)$$

$$10-1 \quad 4(a-b)+x(b-a)=4(a-b)-x(a-b) \\ =(a-b)(4-x)$$

$$10-2 \quad (1+x)(1-y)+(y-1)=(1+x)(1-y)-1 \times (1-y) \\ =(1-y)(1+x-1) \\ =x(1-y)$$

$$11-1 \quad y(x-1)-x+1=y(x-1)-(x-1) \\ =(x-1)(y-1)$$

$$11-2 \quad x(y-z)-(z-y)=x(y-z)+(y-z) \\ =(y-z)(x+1)$$

STEP 2

기본연산 집중연습 | 01~03

p. 130 ~ p. 131

- 1-1 $1, x, x+y$ 1-2 $x, y-1, y^2-1$
 1-3 $1, x, x+6, x(x+6)$ 1-4 $1, x, y, xy, y-x$
 2-1 \times 2-2 \times
 2-3 \times 2-4 \bigcirc
 2-5 \times 2-6 \bigcirc
 3-1 $x(a+b)$ 3-2 $x^2(x-3)$
 3-3 $3a(a+3)$ 3-4 $-x(x+3y)$
 3-5 $3m(a-4b)$ 3-6 $5ab(4a+3b)$
 3-7 $3a(a-2b^2+3b)$ 3-8 $ab(a-b+2)$
 3-9 $2xy(x-2y+a)$ 3-10 $2b(x-y)$
 3-11 $(x-y)(m+n)$

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$$1-3 \quad x^2+6x=x(x+6)$$

$$1-4 \quad xy^2-x^2y=xy(y-x)$$

$$2-1 \quad 12ab+8b^2=4b(3a+2b)$$

$$2-2 \quad -5x^2y+xy=-xy(5x-1)$$

$$2-3 \quad 6a^2-a=a(6a-1)$$

$$2-5 \quad 4x^2y-3xy+x=x(4xy-3y+1)$$

$x^2(x-3)$	$-x(x+3y)$	$3a(a+3)$	$(x-y)(m-n)$	$x(a+b)$
$3m(a-4b)$	$x(a-b)$	$2xy(x-2y+a)$	$-x(x^2-3y)$	$2b(x-y)$
$a(3a+9)$	$a(b-b^2+2a)$	$3a(a-2b^2+3b)$	$xy(2x-4y+2a)$	$ab(a-b+2)$
$2a(x-y)$	$x(x^2-32)$	$(x-y)(m+n)$	$3a(a-2b^2+9b)$	$5ab(4a+3b)$

STEP 1

04 인수분해 공식 (1) : $a^2 \pm 2ab + b^2$ 꼴 p. 132 ~ p. 134

1-1	3, 3, 3	1-2	$(x+2)^2$
2-1	$(x+6)^2$	2-2	$(x+7)^2$
3-1	5, 5, 5	3-2	$(x-4)^2$
4-1	$(x-9)^2$	4-2	$(x-10)^2$
5-1	$(8+x)^2$	5-2	$(11-x)^2$
6-1	3x, 3x, 3x	6-2	$(2x+1)^2$
7-1	$(4x+3)^2$	7-2	$(5x+3)^2$
8-1	4x, 4x, 4x	8-2	$(3x-1)^2$
9-1	$(5x+2)^2$	9-2	$(6x-1)^2$
10-1	$\left(x+\frac{1}{3}\right)^2$	10-2	$\left(x-\frac{1}{4}\right)^2$
11-1	$\left(2x+\frac{1}{3}\right)^2$	11-2	$\left(\frac{1}{2}x-3\right)^2$
12-1	4y, 4y, x+4y	12-2	$(x+y)^2$
13-1	$(x-6y)^2$	13-2	$\left(x-\frac{1}{4}y\right)^2$
14-1	2x, 9y, 9y, 9y	14-2	$(5x-y)^2$
15-1	$(3x+2y)^2$	15-2	$(2x+5y)^2$
16-1	x-3	16-2	$2(x-1)^2$
17-1	$3(x-2y)^2$	17-2	$5(x+y)^2$

- 1-2 $x^2+4x+4=x^2+2 \times x \times 2+2^2=(x+2)^2$
- 2-1 $x^2+12x+36=x^2+2 \times x \times 6+6^2=(x+6)^2$
- 2-2 $x^2+14x+49=x^2+2 \times x \times 7+7^2=(x+7)^2$
- 3-2 $x^2-8x+16=x^2-2 \times x \times 4+4^2=(x-4)^2$
- 4-1 $x^2-18x+81=x^2-2 \times x \times 9+9^2=(x-9)^2$
- 4-2 $x^2-20x+100=x^2-2 \times x \times 10+10^2=(x-10)^2$
- 5-1 $64+16x+x^2=8^2+2 \times 8 \times x+x^2=(8+x)^2$
- 5-2 $121-22x+x^2=11^2-2 \times 11 \times x+x^2=(11-x)^2$
- 6-2 $4x^2+4x+1=(2x)^2+2 \times 2x \times 1+1^2=(2x+1)^2$
- 7-1 $16x^2+24x+9=(4x)^2+2 \times 4x \times 3+3^2=(4x+3)^2$
- 7-2 $25x^2+30x+9=(5x)^2+2 \times 5x \times 3+3^2=(5x+3)^2$
- 8-2 $9x^2-6x+1=(3x)^2-2 \times 3x \times 1+1^2=(3x-1)^2$

- 9-1 $25x^2+20x+4=(5x)^2+2 \times 5x \times 2+2^2=(5x+2)^2$
- 9-2 $36x^2-12x+1=(6x)^2-2 \times 6x \times 1+1^2=(6x-1)^2$
- 10-1 $x^2+\frac{2}{3}x+\frac{1}{9}=x^2+2 \times x \times \frac{1}{3}+\left(\frac{1}{3}\right)^2=\left(x+\frac{1}{3}\right)^2$
- 10-2 $x^2-\frac{1}{2}x+\frac{1}{16}=x^2-2 \times x \times \frac{1}{4}+\left(\frac{1}{4}\right)^2=\left(x-\frac{1}{4}\right)^2$
- 11-1 $4x^2+\frac{4}{3}x+\frac{1}{9}=(2x)^2+2 \times 2x \times \frac{1}{3}+\left(\frac{1}{3}\right)^2$
 $=\left(2x+\frac{1}{3}\right)^2$
- 11-2 $\frac{1}{4}x^2-3x+9=\left(\frac{1}{2}x\right)^2-2 \times \frac{1}{2}x \times 3+3^2$
 $=\left(\frac{1}{2}x-3\right)^2$
- 12-2 $x^2+2xy+y^2=x^2+2 \times x \times y+y^2=(x+y)^2$
- 13-1 $x^2-12xy+36y^2=x^2-2 \times x \times 6y+(6y)^2$
 $=(x-6y)^2$
- 13-2 $x^2-\frac{1}{2}xy+\frac{1}{16}y^2=x^2-2 \times x \times \frac{1}{4}y+\left(\frac{1}{4}y\right)^2$
 $=\left(x-\frac{1}{4}y\right)^2$
- 14-2 $25x^2-10xy+y^2=(5x)^2-2 \times 5x \times y+y^2$
 $=(5x-y)^2$
- 15-1 $9x^2+12xy+4y^2=(3x)^2+2 \times 3x \times 2y+(2y)^2$
 $=(3x+2y)^2$
- 15-2 $4x^2+20xy+25y^2=(2x)^2+2 \times 2x \times 5y+(5y)^2$
 $=(2x+5y)^2$
- 16-2 $2x^2-4x+2=2(x^2-2x+1)=2(x-1)^2$
- 17-1 $3x^2-12xy+12y^2=3(x^2-4xy+4y^2)=3(x-2y)^2$
- 17-2 $5x^2+10xy+5y^2=5(x^2+2xy+y^2)=5(x+y)^2$

05 완전제곱식이 되기 위한 조건 (1)

p. 135

1-1	49	1-2	64
2-1	16	2-2	100
3-1	25	3-2	36
4-1	9	4-2	81
5-1	$\frac{1}{9}$	5-2	$\frac{1}{25}$

1-2 $\square = \left(\frac{16}{2}\right)^2 = 64$

2-1 $\square = \left(\frac{-8}{2}\right)^2 = 16$

2-2 $\square = \left(\frac{-20}{2}\right)^2 = 100$

3-1 $\square = \left(\frac{10}{2}\right)^2 = 25$

3-2 $\square = \left(\frac{12}{2}\right)^2 = 36$

4-1 $\square = \left(\frac{-6}{2}\right)^2 = 9$

4-2 $\square = \left(\frac{-18}{2}\right)^2 = 81$

5-1 $\square = \left\{\frac{1}{2} \times \left(-\frac{2}{3}\right)\right\}^2 = \frac{1}{9}$

5-2 $\square = \left(\frac{1}{2} \times \frac{2}{5}\right)^2 = \frac{1}{25}$

06 완전제곱식이 되기 위한 조건 (2)

p. 136

1-1	± 8	1-2	± 10
2-1	± 16	2-2	± 20
3-1	$\pm \frac{2}{3}$	3-2	$\pm \frac{1}{2}$
4-1	± 6	4-2	± 18
5-1	$\pm \frac{1}{3}$	5-2	$\pm \frac{2}{7}$

1-2 $x^2 + \square x + 25 = x^2 + \square x + (\pm 5)^2$
 $\therefore \square = 2 \times (\pm 5) = \pm 10$

2-1 $x^2 + \square x + 64 = x^2 + \square x + (\pm 8)^2$
 $\therefore \square = 2 \times (\pm 8) = \pm 16$

2-2 $x^2 + \square x + 100 = x^2 + \square x + (\pm 10)^2$
 $\therefore \square = 2 \times (\pm 10) = \pm 20$

3-1 $x^2 + \square x + \frac{1}{9} = x^2 + \square x + \left(\pm \frac{1}{3}\right)^2$
 $\therefore \square = 2 \times \left(\pm \frac{1}{3}\right) = \pm \frac{2}{3}$

3-2 $x^2 + \square x + \frac{1}{16} = x^2 + \square x + \left(\pm \frac{1}{4}\right)^2$
 $\therefore \square = 2 \times \left(\pm \frac{1}{4}\right) = \pm \frac{1}{2}$

4-1 $x^2 + \square xy + 9y^2 = x^2 + \square xy + (\pm 3y)^2$
 $\therefore \square = 2 \times (\pm 3) = \pm 6$

4-2 $x^2 + \square xy + 81y^2 = x^2 + \square xy + (\pm 9y)^2$
 $\therefore \square = 2 \times (\pm 9) = \pm 18$

5-1 $x^2 + \square xy + \frac{1}{36}y^2 = x^2 + \square xy + \left(\pm \frac{1}{6}y\right)^2$
 $\therefore \square = 2 \times \left(\pm \frac{1}{6}\right) = \pm \frac{1}{3}$

5-2 $x^2 + \square xy + \frac{1}{49}y^2 = x^2 + \square xy + \left(\pm \frac{1}{7}y\right)^2$
 $\therefore \square = 2 \times \left(\pm \frac{1}{7}\right) = \pm \frac{2}{7}$

07 완전제곱식이 되기 위한 조건 (3)

p. 137 ~ p. 138

1-1	4	연구	2	1-2	49
2-1	9			2-2	9
3-1	y^2			3-2	$9y^2$
4-1	$16y^2$			4-2	$4y^2$
5-1	$\frac{1}{4}y^2$			5-2	$\frac{1}{25}y^2$
6-1	± 12	연구	3, 3	6-2	± 24
7-1	± 8			7-2	± 14
8-1	± 30			8-2	± 20
9-1	± 28			9-2	± 24
10-1	± 10			10-2	± 56
11-1	± 2			11-2	± 4

1-2 $4x^2 - 28x + \square = (2x)^2 - 2 \times 2x \times 7 + \square$
 $\therefore \square = 7^2 = 49$

2-1 $16x^2 + 24x + \square = (4x)^2 + 2 \times 4x \times 3 + \square$
 $\therefore \square = 3^2 = 9$

2-2 $25x^2 + 30x + \square = (5x)^2 + 2 \times 5x \times 3 + \square$
 $\therefore \square = 3^2 = 9$

3-1 $4x^2 - 4xy + \square = (2x)^2 - 2 \times 2x \times y + \square$
 $\therefore \square = y^2$

$$3-2 \quad 4x^2 + 12xy + \square = (2x)^2 + 2 \times 2x \times 3y + \square$$

$$\therefore \square = (3y)^2 = 9y^2$$

$$4-1 \quad 9x^2 + 24xy + \square = (3x)^2 + 2 \times 3x \times 4y + \square$$

$$\therefore \square = (4y)^2 = 16y^2$$

$$4-2 \quad 25x^2 + 20xy + \square = (5x)^2 + 2 \times 5x \times 2y + \square$$

$$\therefore \square = (2y)^2 = 4y^2$$

$$5-1 \quad 9x^2 + 3xy + \square = (3x)^2 + 2 \times 3x \times \frac{1}{2}y + \square$$

$$\therefore \square = \left(\frac{1}{2}y\right)^2 = \frac{1}{4}y^2$$

$$5-2 \quad 25x^2 + 2xy + \square = (5x)^2 + 2 \times 5x \times \frac{1}{5}y + \square$$

$$\therefore \square = \left(\frac{1}{5}y\right)^2 = \frac{1}{25}y^2$$

$$6-2 \quad 9x^2 + \square x + 16 = (3x)^2 + \square x + (\pm 4)^2$$

$$\therefore \square = 2 \times 3 \times (\pm 4) = \pm 24$$

$$7-1 \quad 16x^2 + \square x + 1 = (4x)^2 + \square x + (\pm 1)^2$$

$$\therefore \square = 2 \times 4 \times (\pm 1) = \pm 8$$

$$7-2 \quad 49x^2 + \square x + 1 = (7x)^2 + \square x + (\pm 1)^2$$

$$\therefore \square = 2 \times 7 \times (\pm 1) = \pm 14$$

$$8-1 \quad 9x^2 + \square x + 25 = (3x)^2 + \square x + (\pm 5)^2$$

$$\therefore \square = 2 \times 3 \times (\pm 5) = \pm 30$$

$$8-2 \quad 25x^2 + \square x + 4 = (5x)^2 + \square x + (\pm 2)^2$$

$$\therefore \square = 2 \times 5 \times (\pm 2) = \pm 20$$

$$9-1 \quad 4x^2 + \square xy + 49y^2 = (2x)^2 + \square xy + (\pm 7y)^2$$

$$\therefore \square = 2 \times 2 \times (\pm 7) = \pm 28$$

$$9-2 \quad 16x^2 + \square xy + 9y^2 = (4x)^2 + \square xy + (\pm 3y)^2$$

$$\therefore \square = 2 \times 4 \times (\pm 3) = \pm 24$$

$$10-1 \quad 25x^2 + \square xy + y^2 = (5x)^2 + \square xy + (\pm y)^2$$

$$\therefore \square = 2 \times 5 \times (\pm 1) = \pm 10$$

$$10-2 \quad 49x^2 + \square xy + 16y^2 = (7x)^2 + \square xy + (\pm 4y)^2$$

$$\therefore \square = 2 \times 7 \times (\pm 4) = \pm 56$$

$$11-1 \quad \frac{1}{4}x^2 + \square xy + 4y^2 = \left(\frac{1}{2}x\right)^2 + \square xy + (\pm 2y)^2$$

$$\therefore \square = 2 \times \frac{1}{2} \times (\pm 2) = \pm 2$$

$$11-2 \quad \frac{1}{9}x^2 + \square xy + 36y^2 = \left(\frac{1}{3}x\right)^2 + \square xy + (\pm 6y)^2$$

$$\therefore \square = 2 \times \frac{1}{3} \times (\pm 6) = \pm 4$$

08 인수분해 공식 (2) : $a^2 - b^2$ 꼴

p. 139 ~ p. 141

$$1-1 \quad 8, 8, 8$$

$$2-1 \quad (x+4)(x-4)$$

$$3-1 \quad \left(x+\frac{1}{3}\right)\left(x-\frac{1}{3}\right)$$

$$4-1 \quad \left(x+\frac{4}{5}\right)\left(x-\frac{4}{5}\right)$$

$$5-1 \quad (9+x)(9-x)$$

$$6-1 \quad 4, 4, 4$$

$$7-1 \quad (7x+5)(7x-5)$$

$$8-1 \quad 2, 2, 2$$

$$9-1 \quad (2x+3y)(2x-3y)$$

$$10-1 \quad (6x+5y)(6x-5y)$$

$$11-1 \quad \left(\frac{1}{3}x+\frac{1}{2}y\right)\left(\frac{1}{3}x-\frac{1}{2}y\right)$$

$$12-1 \quad 25, 5, 5, 5$$

$$13-1 \quad 5(x+2)(x-2)$$

$$14-1 \quad 6(x+y)(x-y)$$

$$15-1 \quad 5(3x+y)(3x-y)$$

$$16-1 \quad (5+x)(5-x)$$

$$17-1 \quad -4(2x+3y)(2x-3y)$$

$$1-2 \quad (x+7)(x-7)$$

$$2-2 \quad (x+6)(x-6)$$

$$3-2 \quad \left(x+\frac{1}{2}\right)\left(x-\frac{1}{2}\right)$$

$$4-2 \quad \left(x+\frac{6}{7}\right)\left(x-\frac{6}{7}\right)$$

$$5-2 \quad (10+x)(10-x)$$

$$6-2 \quad (2x+1)(2x-1)$$

$$7-2 \quad (6x+5)(6x-5)$$

$$8-2 \quad (x+4y)(x-4y)$$

$$9-2 \quad (4x+7y)(4x-7y)$$

$$10-2 \quad (9x+8y)(9x-8y)$$

$$11-2 \quad \left(\frac{4}{7}x+\frac{2}{3}y\right)\left(\frac{4}{7}x-\frac{2}{3}y\right)$$

$$12-2 \quad 3(x+1)(x-1)$$

$$13-2 \quad 4(x+3)(x-3)$$

$$14-2 \quad 3(x+5y)(x-5y)$$

$$15-2 \quad 3(3x+2y)(3x-2y)$$

$$16-2 \quad (11+x)(11-x)$$

$$17-2 \quad -2(5x+2y)(5x-2y)$$

$$1-2 \quad x^2 - 49 = x^2 - 7^2 = (x+7)(x-7)$$

$$2-1 \quad x^2 - 16 = x^2 - 4^2 = (x+4)(x-4)$$

$$2-2 \quad x^2 - 36 = x^2 - 6^2 = (x+6)(x-6)$$

$$3-1 \quad x^2 - \frac{1}{9} = x^2 - \left(\frac{1}{3}\right)^2 = \left(x+\frac{1}{3}\right)\left(x-\frac{1}{3}\right)$$

$$3-2 \quad x^2 - \frac{1}{4} = x^2 - \left(\frac{1}{2}\right)^2 = \left(x+\frac{1}{2}\right)\left(x-\frac{1}{2}\right)$$

$$4-1 \quad x^2 - \frac{16}{25} = x^2 - \left(\frac{4}{5}\right)^2 = \left(x+\frac{4}{5}\right)\left(x-\frac{4}{5}\right)$$

$$4-2 \quad x^2 - \frac{36}{49} = x^2 - \left(\frac{6}{7}\right)^2 = \left(x+\frac{6}{7}\right)\left(x-\frac{6}{7}\right)$$

$$5-1 \quad 81 - x^2 = 9^2 - x^2 = (9+x)(9-x)$$

$$5-2 \quad 100 - x^2 = 10^2 - x^2 = (10+x)(10-x)$$

$$6-2 \quad 4x^2 - 1 = (2x)^2 - 1^2 = (2x+1)(2x-1)$$

$$7-1 \quad 49x^2 - 25 = (7x)^2 - 5^2 = (7x+5)(7x-5)$$

$$7-2 \quad 36x^2 - 25 = (6x)^2 - 5^2 = (6x+5)(6x-5)$$

$$8-2 \quad x^2 - 16y^2 = x^2 - (4y)^2 = (x+4y)(x-4y)$$

$$9-1 \quad 4x^2 - 9y^2 = (2x)^2 - (3y)^2 = (2x+3y)(2x-3y)$$

$$9-2 \quad 16x^2 - 49y^2 = (4x)^2 - (7y)^2 = (4x+7y)(4x-7y)$$

10-1 $36x^2 - 25y^2 = (6x)^2 - (5y)^2 = (6x+5y)(6x-5y)$

10-2 $81x^2 - 64y^2 = (9x)^2 - (8y)^2 = (9x+8y)(9x-8y)$

11-1 $\frac{1}{9}x^2 - \frac{1}{4}y^2 = \left(\frac{1}{3}x\right)^2 - \left(\frac{1}{2}y\right)^2$
 $= \left(\frac{1}{3}x + \frac{1}{2}y\right)\left(\frac{1}{3}x - \frac{1}{2}y\right)$

11-2 $\frac{16}{49}x^2 - \frac{4}{9}y^2 = \left(\frac{4}{7}x\right)^2 - \left(\frac{2}{3}y\right)^2$
 $= \left(\frac{4}{7}x + \frac{2}{3}y\right)\left(\frac{4}{7}x - \frac{2}{3}y\right)$

12-2 $3x^2 - 3 = 3(x^2 - 1) = 3(x+1)(x-1)$

13-1 $5x^2 - 20 = 5(x^2 - 4) = 5(x+2)(x-2)$

13-2 $4x^2 - 36 = 4(x^2 - 9) = 4(x+3)(x-3)$

14-1 $6x^2 - 6y^2 = 6(x^2 - y^2) = 6(x+y)(x-y)$

14-2 $3x^2 - 75y^2 = 3(x^2 - 25y^2) = 3(x+5y)(x-5y)$

15-1 $45x^2 - 5y^2 = 5(9x^2 - y^2) = 5(3x+y)(3x-y)$

15-2 $27x^2 - 12y^2 = 3(9x^2 - 4y^2) = 3(3x+2y)(3x-2y)$

16-1 $-x^2 + 25 = 25 - x^2 = (5+x)(5-x)$

16-2 $-x^2 + 121 = 121 - x^2 = (11+x)(11-x)$

17-1 $-16x^2 + 36y^2 = -4(4x^2 - 9y^2)$
 $= -4(2x+3y)(2x-3y)$

17-2 $-50x^2 + 8y^2 = -2(25x^2 - 4y^2)$
 $= -2(5x+2y)(5x-2y)$

STEP 2

기본연산 집중연습 | 04~08

p. 142 ~ p. 143

1-1 $(x-8)^2$

1-2 $(3x+4)^2$

1-3 $\left(x - \frac{3}{2}\right)^2$

1-4 $3(x-3y)^2$

1-5 $(2x+3)(2x-3)$

1-6 $(8x+7y)(8x-7y)$

1-7 $(1+3x)(1-3x)$

1-8 $2(4x+3y)(4x-3y)$

2-1 9

2-2 4

2-3 81

2-4 14

2-5 18

2-6 20

3 (1) × (2) ○ (3) × (4) ○ (5) ○ (6) × (7) × (8) ×

Level 1 획득 보석 1개, Level 2 획득 보석 2개

3 (1) $x^2 + 6xy + 9y^2 = (x+3y)^2$

(3) $16x^2 - 9y^2 = (4x)^2 - (3y)^2 = (4x+3y)(4x-3y)$

(6) $4x^2 - 25 = (2x)^2 - 5^2 = (2x+5)(2x-5)$

(7) $18x^2 - 24x + 8 = 2(9x^2 - 12x + 4) = 2(3x-2)^2$

(8) $25x^2 + 20xy + 4y^2 = (5x+2y)^2$

STEP 1

09 인수분해 공식 (3) :

$x^2 + (a+b)x + ab$ 꼴 (1)

p. 144 ~ p. 145

1-1 -2, -3, -1, -2

1-2 1, 4

2-1 2, 4

2-2 -1, -5

3-1 -1, 2

3-2 -2, 4

4-1 1, -5

4-2 -5, 3

5-1 $(x+1)(x-4), x, -4, -4x$

5-2 $(x+1)(x+4), 1, x, 4, 4x$

6-1 $(x-2)(x-7), -2, -2x, -7, -7x$

6-2 $(x-2)(x+4), -2, -2x, 4, 4x$

7-1 $(x-5)(x-7)$

7-2 $(x-4)(x+5)$

8-1 $(x-7)(x-9)$

8-2 $(x+3)(x-4)$

9-1 $(x-4)(x-5)$

9-2 $(x+1)(x-8)$

10-1 $(x-3)(x+8)$

10-2 $(x+3)(x+7)$

1-2

곱이 4인 두 정수	두 정수의 합
1, 4	5
2, 2	4
-1, -4	-5
-2, -2	-4

⇒ 곱이 4이고 합이 5인 두 정수는 1, 4이다.

2-1

곱이 8인 두 정수	두 정수의 합
1, 8	9
2, 4	6
-1, -8	-9
-2, -4	-6

⇒ 곱이 8이고 합이 6인 두 정수는 2, 4이다.

2-2

곱이 5인 두 정수	두 정수의 합
1, 5	6
-1, -5	-6

⇒ 곱이 5이고 합이 -6인 두 정수는 -1, -5이다.

3-1

곱이 -2인 두 정수	두 정수의 합
-1, 2	1
1, -2	-1

⇒ 곱이 -2이고 합이 1인 두 정수는 -1, 2이다.

3-2	곱이 -8인 두 정수	두 정수의 합
	-1, 8	7
	-2, 4	2
	-4, 2	-2
	-8, 1	-7

⇒ 곱이 -8이고 합이 2인 두 정수는 -2, 4이다.

4-1	곱이 -5인 두 정수	두 정수의 합
	-1, 5	4
	1, -5	-4

⇒ 곱이 -5이고 합이 -4인 두 정수는 1, -5이다.

4-2	곱이 -15인 두 정수	두 정수의 합
	-1, 15	14
	-3, 5	2
	-5, 3	-2
	-15, 1	-14

⇒ 곱이 -15이고 합이 -2인 두 정수는 -5, 3이다.

5-1 $x^2 - 3x - 4 = (x+1)(x-4)$

5-2 $x^2 + 5x + 4 = (x+1)(x+4)$

6-1 $x^2 - 9x + 14 = (x-2)(x-7)$

6-2 $x^2 + 2x - 8 = (x-2)(x+4)$

7-1 $x^2 - 12x + 35 = (x-5)(x-7)$

7-2 $x^2 + x - 20 = (x-4)(x+5)$

8-1 $x^2 - 16x + 63 = (x-7)(x-9)$

8-2 $x^2 - x - 12 = (x+3)(x-4)$

9-1 $x^2 - 9x + 20 = (x-4)(x-5)$

9-2 $x^2 - 7x - 8 = (x+1)(x-8)$

10-1 $x^2 + 5x - 24 = (x-3)(x+8)$

10-2 $x^2 + 10x + 21 = (x+3)(x+7)$

10 인수분해 공식 (3) :

$$x^2 + (a+b)x + ab \text{ 꼴 (2)}$$

p. 146 ~ p. 147

1-1 $(x+2y)(x+3y), 2y, 3y, 3xy$

1-2 $(x+y)(x+3y), y, xy, 3y, 3xy$

2-1 $(x-2y)(x-5y), -2y, -2xy, -5y, -5xy$

2-2 $(x-3y)(x-7y), -3y, -3xy, -7y, -7xy$

3-1 $(x+3y)(x-4y), 3y, 3xy, -4y, -4xy$

3-2 $(x+4y)(x-9y), 4y, 4xy, -9y, -9xy$

4-1 $(x-4y)(x+6y), -4y, -4xy, 6y, 6xy$

4-2 $(x-3y)(x+10y), -3y, -3xy, 10y, 10xy$

5-1 $(x+y)(x+3y)$

5-2 $(x+3y)(x+4y)$

6-1 $(x-2y)(x-3y)$

6-2 $(x-2y)(x-9y)$

7-1 $(x-y)(x+4y)$

7-2 $(x-7y)(x+8y)$

8-1 $(x+3y)(x-7y)$

8-2 $(x+6y)(x-7y)$

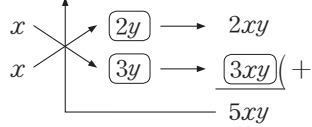
9-1 $2(x+1)(x+5)$

9-2 $3(x+1)(x-7)$

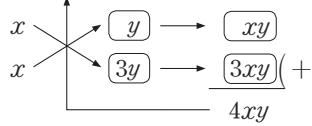
10-1 $4(x-y)(x-3y)$

10-2 $3(x+3y)(x-5y)$

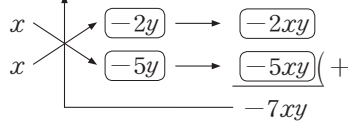
$$1-1 \quad x^2 + 5xy + 6y^2 = (x+2y)(x+3y)$$



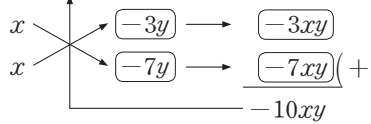
$$1-2 \quad x^2 + 4xy + 3y^2 = (x+y)(x+3y)$$



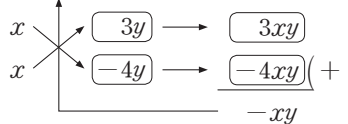
$$2-1 \quad x^2 - 7xy + 10y^2 = (x-2y)(x-5y)$$



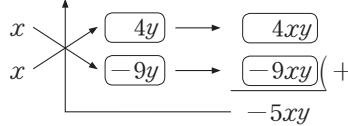
$$2-2 \quad x^2 - 10xy + 21y^2 = (x-3y)(x-7y)$$



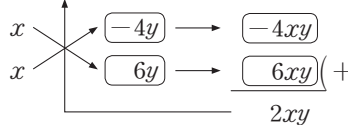
$$3-1 \quad x^2 - xy - 12y^2 = (x+3y)(x-4y)$$



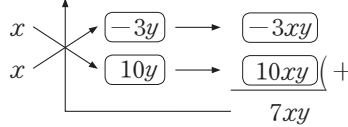
$$3-2 \quad x^2 - 5xy - 36y^2 = (x+4y)(x-9y)$$



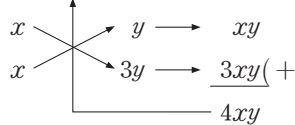
$$4-1 \quad x^2 + 2xy - 24y^2 = (x-4y)(x+6y)$$



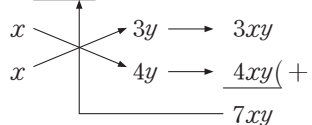
$$4-2 \quad x^2 + 7xy - 30y^2 = (x-3y)(x+10y)$$



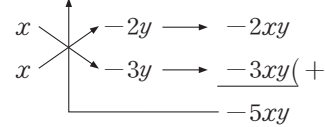
$$5-1 \quad x^2 + 4xy + 3y^2 = (x+y)(x+3y)$$



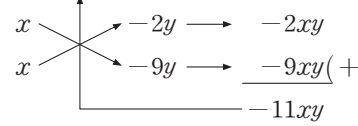
$$5-2 \quad x^2 + 7xy + 12y^2 = (x+3y)(x+4y)$$



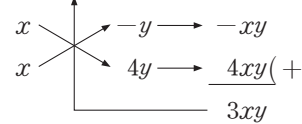
$$6-1 \quad x^2 - 5xy + 6y^2 = (x-2y)(x-3y)$$



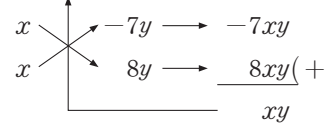
$$6-2 \quad x^2 - 11xy + 18y^2 = (x-2y)(x-9y)$$



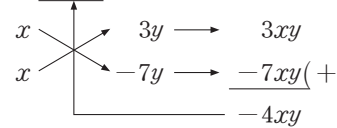
$$7-1 \quad x^2 + 3xy - 4y^2 = (x-y)(x+4y)$$



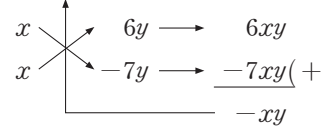
$$7-2 \quad x^2 + xy - 56y^2 = (x-7y)(x+8y)$$



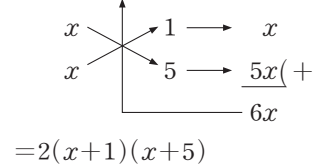
$$8-1 \quad x^2 - 4xy - 21y^2 = (x+3y)(x-7y)$$



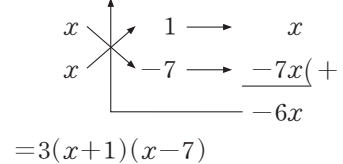
$$8-2 \quad x^2 - xy - 42y^2 = (x+6y)(x-7y)$$



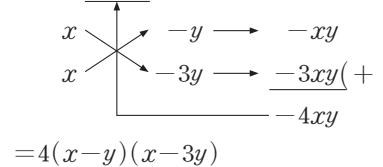
$$9-1 \quad 2x^2 + 12x + 10 = 2(x^2 + 6x + 5)$$



$$9-2 \quad 3x^2 - 18x - 21 = 3(x^2 - 6x - 7)$$



$$10-1 \quad 4x^2 - 16xy + 12y^2 = 4(x^2 - 4xy + 3y^2)$$



10-2 $3x^2 - 6xy - 45y^2 = 3(x^2 - 2xy - 15y^2)$

$$= 3(x + 3y)(x - 5y)$$

11 인수분해 공식 (4) :

$acx^2 + (ad + bc)x + bd$ 꼴 (1)

p. 148 ~ p. 149

1-1 $(x+2)(2x+1)$, $4x$, $2x$, 1 , x

1-2 $(x+2)(5x+2)$, $10x$, $5x$, 2 , $2x$

2-1 $(x-1)(2x-3)$, $-2x$, $2x$, -3 , $-3x$

2-2 $(2x-1)(3x-2)$, $-3x$, $3x$, -2 , $-4x$

3-1 $(3x-4)(x+2)$, $3x$, -4 , $-4x$, $6x$

3-2 $(2x-3)(3x+5)$, $2x$, -3 , $-9x$, $10x$

4-1 $(x+1)(2x-3)$, $2x$, $2x$, -3 , $-3x$

4-2 $(3x-2)(3x+1)$, $3x$, -2 , $-6x$, $3x$

5-1 $(x+3)(4x+1)$ **5-2** $(x+3)(2x+3)$

6-1 $(3x+2)(4x+3)$ **6-2** $(x-2)(5x-2)$

7-1 $(x-3)(3x-2)$ **7-2** $(x-4)(2x-9)$

8-1 $(2x-1)(2x+3)$ **8-2** $(x+2)(3x-1)$

9-1 $(x-2)(2x+9)$ **9-2** $(2x-3)(3x+1)$

10-1 $(x+1)(5x-9)$ **10-2** $(x-6)(5x+1)$

1-1 $2x^2 + 5x + 2 = (x+2)(2x+1)$

1-2 $5x^2 + 12x + 4 = (x+2)(5x+2)$

2-1 $2x^2 - 5x + 3 = (x-1)(2x-3)$

2-2 $6x^2 - 7x + 2 = (2x-1)(3x-2)$

3-1 $3x^2 + 2x - 8 = (3x-4)(x+2)$

3-2 $6x^2 + x - 15 = (2x-3)(3x+5)$

4-1 $2x^2 - x - 3 = (x+1)(2x-3)$

4-2 $9x^2 - 3x - 2 = (3x-2)(3x+1)$

5-1 $4x^2 + 13x + 3 = (x+3)(4x+1)$

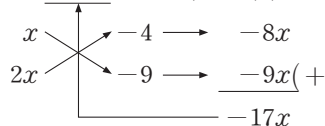
5-2 $2x^2 + 9x + 9 = (x+3)(2x+3)$

6-1 $12x^2 + 17x + 6 = (3x+2)(4x+3)$

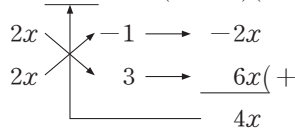
6-2 $5x^2 - 12x + 4 = (x-2)(5x-2)$

7-1 $3x^2 - 11x + 6 = (x-3)(3x-2)$

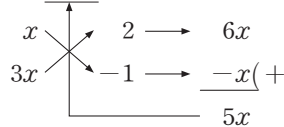
7-2 $2x^2 - 17x + 36 = (x-4)(2x-9)$



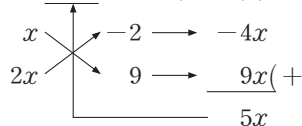
8-1 $4x^2 + 4x - 3 = (2x-1)(2x+3)$



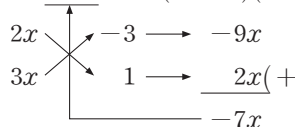
8-2 $3x^2 + 5x - 2 = (x+2)(3x-1)$



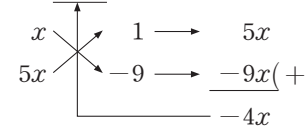
9-1 $2x^2 + 5x - 18 = (x-2)(2x+9)$



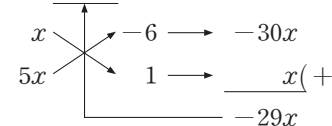
9-2 $6x^2 - 7x - 3 = (2x-3)(3x+1)$



10-1 $5x^2 - 4x - 9 = (x+1)(5x-9)$



10-2 $5x^2 - 29x - 6 = (x-6)(5x+1)$



12 인수분해 공식 (4) :

$acx^2 + (ad+bc)x + bd$ 꼴 (2)

p. 150 ~ p. 151

1-1 $(2x+3y)(2x+5y), 6xy, 2x, 5y, 10xy$

1-2 $(x+2y)(2x+3y), 4xy, 2x, 3y, 3xy$

2-1 $(2x-y)(5x+3y), 2x, -y, -5xy, 6xy$

2-2 $(2x-y)(3x+4y), -3xy, 3x, 4y, 8xy$

3-1 $(x+2y)(5x-3y), 10xy, 5x, -3y, -3xy$

3-2 $(x+4y)(3x-2y), 12xy, 3x, -2y, -2xy$

4-1 $(x-2y)(2x+3y), x, -2y, -4xy, 3xy$

4-2 $(2x-3y)(4x+5y), -12xy, 4x, 5y, 10xy$

5-1 $(x+6y)(2x+y)$ **5-2** $(2x+3y)(5x+y)$

6-1 $(x-2y)(5x-2y)$ **6-2** $(2x-3y)(3x-5y)$

7-1 $(2x-3y)(3x+5y)$

7-2 $(2x+3y)(5x-7y)$

8-1 $(x+2y)(2x-5y)$

8-2 $(2x-3y)(3x+4y)$

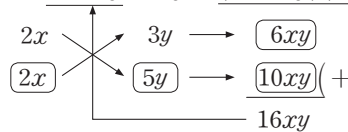
9-1 $3(x+2)(2x+1)$

9-2 $2(x-2)(5x-3)$

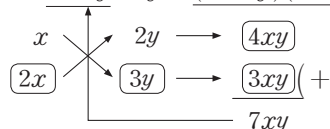
10-1 $2(2x+y)(2x-3y)$

10-2 $3(x+4y)(3x-y)$

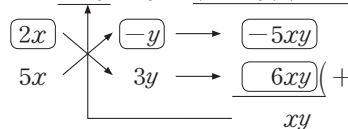
1-1 $4x^2 + 16xy + 15y^2 = (2x+3y)(2x+5y)$



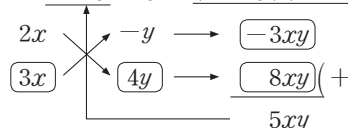
1-2 $2x^2 + 7xy + 6y^2 = (x+2y)(2x+3y)$



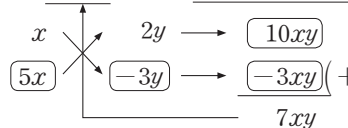
2-1 $10x^2 + xy - 3y^2 = (2x-y)(5x+3y)$



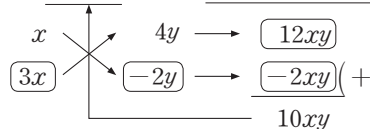
2-2 $6x^2 + 5xy - 4y^2 = (2x-y)(3x+4y)$



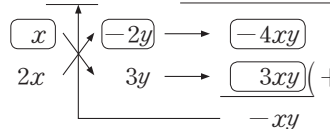
3-1 $5x^2 + 7xy - 6y^2 = (x+2y)(5x-3y)$



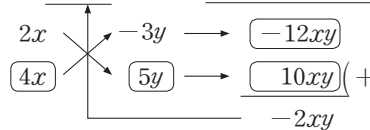
3-2 $3x^2 + 10xy - 8y^2 = (x+4y)(3x-2y)$



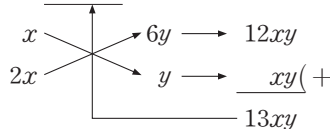
4-1 $2x^2 - xy - 6y^2 = (x-2y)(2x+3y)$



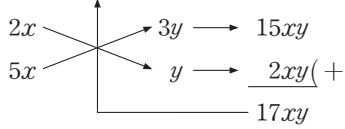
4-2 $8x^2 - 2xy - 15y^2 = (2x-3y)(4x+5y)$



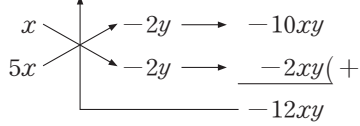
5-1 $2x^2 + 13xy + 6y^2 = (x+6y)(2x+y)$



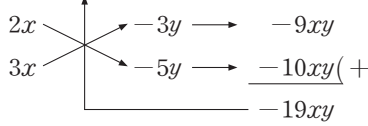
5-2 $10x^2 + 17xy + 3y^2 = (2x + 3y)(5x + y)$



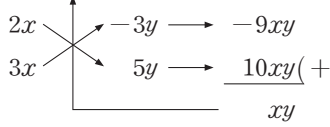
6-1 $5x^2 - 12xy + 4y^2 = (x - 2y)(5x - 2y)$



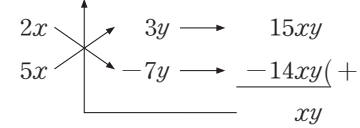
6-2 $6x^2 - 19xy + 15y^2 = (2x - 3y)(3x - 5y)$



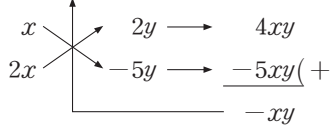
7-1 $6x^2 + xy - 15y^2 = (2x - 3y)(3x + 5y)$



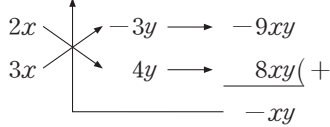
7-2 $10x^2 + xy - 21y^2 = (2x + 3y)(5x - 7y)$



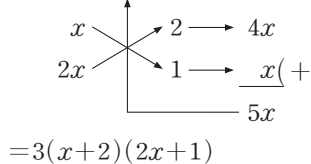
8-1 $2x^2 - xy - 10y^2 = (x + 2y)(2x - 5y)$



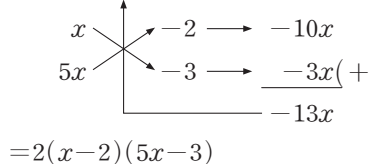
8-2 $6x^2 - xy - 12y^2 = (2x - 3y)(3x + 4y)$



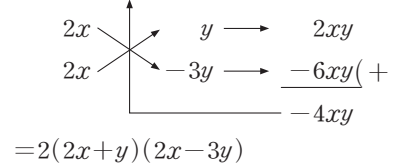
9-1 $6x^2 + 15x + 6 = 3(2x^2 + 5x + 2)$



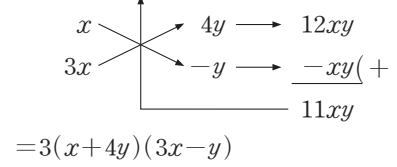
9-2 $10x^2 - 26x + 12 = 2(5x^2 - 13x + 6)$



10-1 $8x^2 - 8xy - 6y^2 = 2(4x^2 - 4xy - 3y^2)$



10-2 $9x^2 + 33xy - 12y^2 = 3(3x^2 + 11xy - 4y^2)$



STEP 2

기본연산 집중연습 | 09~12

p. 152 ~ p. 153

1-1 $(x - 4)(x + 7)$

1-2 $(x + 2)(x + 7)$

1-3 $(x - 8)(x - 9)$

1-4 $(x + 7)(x + 10)$

1-5 $2(x + 2)(x - 10)$

1-6 $(x + 2y)(x - 5y)$

1-7 $(x - 5)(2x + 1)$

1-8 $(x + 1)(4x - 1)$

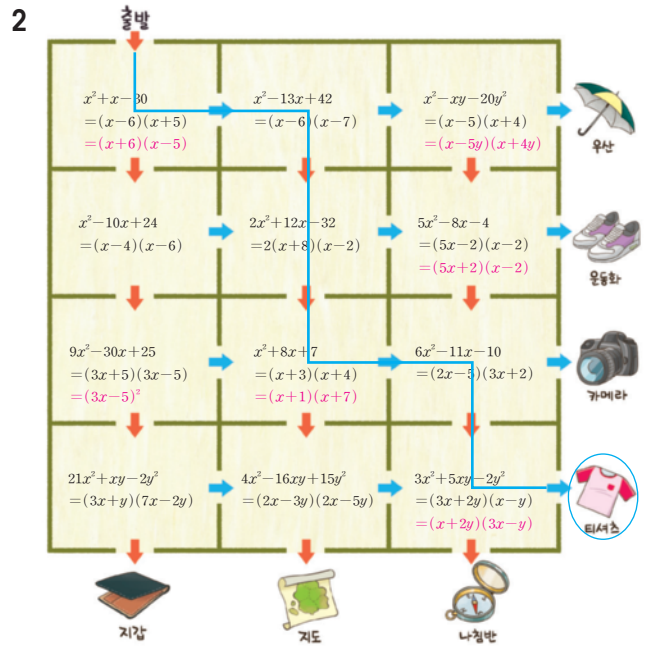
1-9 $(x - 3)(4x + 1)$

1-10 $(x - 2)(3x + 8)$

1-11 $(x + 3y)(5x - 2y)$

1-12 $(2x + y)(2x - 3y)$

2 티셔츠



STEP 1

13 복잡한 식의 인수분해 (1) : 공통인수

p. 154

- 1-1 $a, a, 2$ 1-2 $y(1+x)(1-x)$
 2-1 $x(x-2)(x+5)$ 2-2 $2x(y+3)(y-4)$
 3-1 $a(x-5)(x+6)$ 3-2 $y(x+1)(2x-3)$
 4-1 $2z(3x+4y)(3x-4y)$ 4-2 $3c(5a+4b)(5a-4b)$
 5-1 $xy(x+3y)^2$ 5-2 $ab\left(a-\frac{1}{3}b\right)^2$

- 1-2 $y-x^2y=y(1-x^2)=y(1+x)(1-x)$
 2-1 $x^3+3x^2-10x=x(x^2+3x-10)=x(x-2)(x+5)$
 2-2 $2xy^2-2xy-24x=2x(y^2-y-12)=2x(y+3)(y-4)$
 3-1 $ax^2+ax-30a=a(x^2+x-30)=a(x-5)(x+6)$
 3-2 $2x^2y-xy-3y=y(2x^2-x-3)=y(x+1)(2x-3)$
 4-1 $18x^2z-32y^2z=2z(9x^2-16y^2)$
 $=2z(3x+4y)(3x-4y)$
 4-2 $75a^2c-48b^2c=3c(25a^2-16b^2)$
 $=3c(5a+4b)(5a-4b)$
 5-1 $x^3y+6x^2y^2+9xy^3=xy(x^2+6xy+9y^2)=xy(x+3y)^2$
 5-2 $a^3b-\frac{2}{3}a^2b^2+\frac{1}{9}ab^3=ab\left(a^2-\frac{2}{3}ab+\frac{1}{9}b^2\right)$
 $=ab\left(a-\frac{1}{3}b\right)^2$

14 복잡한 식의 인수분해 (2) : 치환 이용

p. 155 ~ p. 156

- 1-1 $3, 3, x-4$ 1-2 $(x-2)(x+7)$
 2-1 $(x-2)(x+1)$ 2-2 $(x+3)(x-5)$
 3-1 $(x-4)^2$ 3-2 $(x+6)^2$
 4-1 $(x+1)(3x+10)$ 4-2 $3x(9x+5)$
 5-1 $B, x-y, 3x(x+2y)$ 5-2 $(x+y+1)(x-y-9)$
 6-1 $(3x+y)(-x+3y)$ 6-2 $-9x(11x-10y)$
 7-1 $(-2x+7)^2$ 7-2 $(x+4y+7)(x-6y-13)$
 8-1 $3, (x-2y+4)(x-2y-3)$
 8-2 $(x+y-1)(x+y+4)$
 9-1 $(x+4y-1)(x+4y-3)$
 9-2 $(2x+y-3)(2x+y+5)$

$$\begin{aligned} 1-2 \quad & (x+1)^2+3(x+1)-18 \\ & =A^2+3A-18 \\ & =(A-3)(A+6) \\ & =(x+1-3)(x+1+6) \\ & =(x-2)(x+7) \end{aligned} \quad \begin{array}{l} x+1=A \text{로 치환} \\ \swarrow \\ \text{인수분해} \\ \swarrow \\ A=x+1 \text{을 대입} \end{array}$$

$$\begin{aligned} 2-1 \quad & (x-4)^2+7(x-4)+10 \\ & =A^2+7A+10 \\ & =(A+2)(A+5) \\ & =(x-4+2)(x-4+5) \\ & =(x-2)(x+1) \end{aligned} \quad \begin{array}{l} x-4=A \text{로 치환} \\ \swarrow \\ \text{인수분해} \\ \swarrow \\ A=x-4 \text{를 대입} \end{array}$$

$$\begin{aligned} 2-2 \quad & (x+1)^2-4(x+1)-12 \\ & =A^2-4A-12 \\ & =(A+2)(A-6) \\ & =(x+1+2)(x+1-6) \\ & =(x+3)(x-5) \end{aligned} \quad \begin{array}{l} x+1=A \text{로 치환} \\ \swarrow \\ \text{인수분해} \\ \swarrow \\ A=x+1 \text{을 대입} \end{array}$$

$$\begin{aligned} 3-1 \quad & (x-1)^2-6(x-1)+9 \\ & =A^2-6A+9 \\ & =(A-3)^2 \\ & =(x-1-3)^2 \\ & =(x-4)^2 \end{aligned} \quad \begin{array}{l} x-1=A \text{로 치환} \\ \swarrow \\ \text{인수분해} \\ \swarrow \\ A=x-1 \text{을 대입} \end{array}$$

$$\begin{aligned} 3-2 \quad & (x+1)^2+10(x+1)+25 \\ & =A^2+10A+25 \\ & =(A+5)^2 \\ & =(x+1+5)^2 \\ & =(x+6)^2 \end{aligned} \quad \begin{array}{l} x+1=A \text{로 치환} \\ \swarrow \\ \text{인수분해} \\ \swarrow \\ A=x+1 \text{을 대입} \end{array}$$

$$\begin{aligned} 4-1 \quad & 3(x+3)^2-5(x+3)-2 \\ & =3A^2-5A-2 \\ & =(A-2)(3A+1) \\ & =(x+3-2)\{3(x+3)+1\} \\ & =(x+1)(3x+10) \end{aligned} \quad \begin{array}{l} x+3=A \text{로 치환} \\ \swarrow \\ \text{인수분해} \\ \swarrow \\ A=x+3 \text{을 대입} \end{array}$$

$$\begin{aligned} 4-2 \quad & 3(3x+1)^2-(3x+1)-2 \\ & =3A^2-A-2 \\ & =(A-1)(3A+2) \\ & =(3x+1-1)\{3(3x+1)+2\} \\ & =3x(9x+5) \end{aligned} \quad \begin{array}{l} 3x+1=A \text{로 치환} \\ \swarrow \\ \text{인수분해} \\ \swarrow \\ A=3x+1 \text{을 대입} \end{array}$$

5-2 $x-4=A, y+5=B$ 로 치환하면

$$\begin{aligned} & (x-4)^2 - (y+5)^2 \\ &= A^2 - B^2 = (A+B)(A-B) \\ &= \{(x-4) + (y+5)\} \{(x-4) - (y+5)\} \\ &= (x+y+1)(x-y-9) \end{aligned}$$

6-1 $x+2y=A, 2x-y=B$ 로 치환하면

$$\begin{aligned} & (x+2y)^2 - (2x-y)^2 \\ &= A^2 - B^2 = (A+B)(A-B) \\ &= \{(x+2y) + (2x-y)\} \{(x+2y) - (2x-y)\} \\ &= (3x+y)(-x+3y) \end{aligned}$$

6-2 $x-5y=A, 2x-y=B$ 로 치환하면

$$\begin{aligned} & (x-5y)^2 - 25(2x-y)^2 \\ &= A^2 - 25B^2 = (A+5B)(A-5B) \\ &= \{(x-5y) + 5(2x-y)\} \{(x-5y) - 5(2x-y)\} \\ &= -9x(11x-10y) \end{aligned}$$

7-1 $x+1=A, x-2=B$ 로 치환하면

$$\begin{aligned} & (x+1)^2 - 6(x+1)(x-2) + 9(x-2)^2 \\ &= A^2 - 6AB + 9B^2 = (A-3B)^2 \\ &= \{x+1-3(x-2)\}^2 = (-2x+7)^2 \end{aligned}$$

7-2 $x-1=A, y+2=B$ 로 치환하면

$$\begin{aligned} & (x-1)^2 - 2(x-1)(y+2) - 24(y+2)^2 \\ &= A^2 - 2AB - 24B^2 = (A+4B)(A-6B) \\ &= \{x-1+4(y+2)\} \{x-1-6(y+2)\} \\ &= (x+4y+7)(x-6y-13) \end{aligned}$$

8-2 $(x+y)(x+y+3)-4$

$$\begin{aligned} &= A(A+3)-4 \\ &= A^2+3A-4 \\ &= (A-1)(A+4) \\ &= (x+y-1)(x+y+4) \end{aligned}$$

$\left. \begin{array}{l} \leftarrow x+y=A \text{로 치환} \\ \leftarrow \text{전개} \\ \leftarrow \text{인수분해} \\ \leftarrow A=x+y \text{를 대입} \end{array} \right\}$

9-1 $(x+4y)(x+4y-4)+3$

$$\begin{aligned} &= A(A-4)+3 \\ &= A^2-4A+3 \\ &= (A-1)(A-3) \\ &= (x+4y-1)(x+4y-3) \end{aligned}$$

$\left. \begin{array}{l} \leftarrow x+4y=A \text{로 치환} \\ \leftarrow \text{전개} \\ \leftarrow \text{인수분해} \\ \leftarrow A=x+4y \text{를 대입} \end{array} \right\}$

9-2 $-12+(2x+y-1)(2x+y+3)$

$$\begin{aligned} &= -12+(A-1)(A+3) \\ &= A^2+2A-15 \\ &= (A-3)(A+5) \\ &= (2x+y-3)(2x+y+5) \end{aligned}$$

$\left. \begin{array}{l} \leftarrow 2x+y=A \text{로 치환} \\ \leftarrow \text{전개} \\ \leftarrow \text{인수분해} \\ \leftarrow A=2x+y \text{를 대입} \end{array} \right\}$

15 복잡한 식의 인수분해 (3) : 항이 4개인 경우 (1) p. 157

1-1 $x+y, x+y, x+y$	1-2 $(x+y)(a+b)$
2-1 $(y-1)(3x-1)$	2-2 $(a-1)(b-c)$
3-1 $(y-5)(x-1)$	3-2 $(b-1)(a+b)$
4-1 $(x-a)(x-b)$	4-2 $(x+y)(x-y-1)$

1-2 $ax+ay+bx+by=a(x+y)+b(x+y)$
 $= (x+y)(a+b)$

2-1 $3xy-3x-y+1=3x(y-1)-(y-1)$
 $= (y-1)(3x-1)$

2-2 $ab-b+c-ac=b(a-1)-c(a-1)=(a-1)(b-c)$

3-1 $xy-5x-y+5=x(y-5)-(y-5)=(y-5)(x-1)$

3-2 $ab-a+b^2-b=a(b-1)+b(b-1)=(b-1)(a+b)$

4-1 $x^2+ab-ax-bx=x^2-ax+ab-bx$
 $= x(x-a)-b(x-a)$
 $= (x-a)(x-b)$

4-2 $x^2-y-y^2-x=x^2-y^2-y-x$
 $= (x+y)(x-y)-(x+y)$
 $= (x+y)(x-y-1)$

16 복잡한 식의 인수분해 (3) : 항이 4개인 경우 (2) p. 158

1-1 $4, 4, 4$	1-2 $(x+y+3)(x-y+3)$
2-1 $(x+y-2)(x-y-2)$	2-2 $(x-3y+3)(x-3y-3)$
3-1 $y+1, y, y$	3-2 $(2x+y+5)(2x+y-5)$
4-1 $(x+y-4)(x-y+4)$	4-2 $(x+y+1)(x-y+1)$

1-2 $x^2+6x+9-y^2=(x^2+6x+9)-y^2$
 $= (x+3)^2-y^2$
 $= (x+3+y)(x+3-y)$
 $= (x+y+3)(x-y+3)$

2-1 $x^2-4x+4-y^2=(x^2-4x+4)-y^2$
 $= (x-2)^2-y^2$
 $= (x-2+y)(x-2-y)$
 $= (x+y-2)(x-y-2)$

2-2 $x^2-6xy+9y^2-9=(x^2-6xy+9y^2)-9$
 $= (x-3y)^2-3^2$
 $= (x-3y+3)(x-3y-3)$

$$\begin{aligned}
 3-2 \quad 4x^2+y^2+4xy-25 &= (4x^2+4xy+y^2)-25 \\
 &= (2x+y)^2-5^2 \\
 &= (2x+y+5)(2x+y-5)
 \end{aligned}$$

$$\begin{aligned}
 4-1 \quad x^2-y^2+8y-16 &= x^2-(y^2-8y+16) \\
 &= x^2-(y-4)^2 \\
 &= \{x+(y-4)\}\{x-(y-4)\} \\
 &= (x+y-4)(x-y+4)
 \end{aligned}$$

$$\begin{aligned}
 4-2 \quad x^2-y^2+2x+1 &= x^2+2x+1-y^2 \\
 &= (x+1)^2-y^2 \\
 &= (x+1+y)(x+1-y) \\
 &= (x+y+1)(x-y+1)
 \end{aligned}$$

17 복잡한 식의 인수분해 (4) : 항이 5개 이상인 경우 p. 159

$$\begin{array}{ll}
 1-1 & x+4, x+y+4 \\
 2-1 & (a-2)(a+2b-3) \\
 3-1 & (a+3b)(a-b-2) \\
 4-1 & y, A+3, x+y+3
 \end{array}
 \quad
 \begin{array}{ll}
 1-2 & (x-3)(x-y-3) \\
 2-2 & (a-1)(a+b+2) \\
 3-2 & (x-2y)(x-3y-1) \\
 4-2 & (a-3b+2)(a-3b-1)
 \end{array}$$

$$\begin{aligned}
 1-2 \quad x^2-xy-6x+3y+9 &= -xy+3y+x^2-6x+9 \\
 &= -y(x-3)+(x-3)^2 \\
 &= (x-3)(-y+x-3) \\
 &= (x-3)(x-y-3)
 \end{aligned}$$

$$\begin{aligned}
 2-1 \quad a^2+2ab-5a-4b+6 &= 2ab-4b+a^2-5a+6 \\
 &= 2b(a-2)+(a-2)(a-3) \\
 &= (a-2)(2b+a-3) \\
 &= (a-2)(a+2b-3)
 \end{aligned}$$

$$\begin{aligned}
 2-2 \quad a^2+ab+a-b-2 &= ab-b+a^2+a-2 \\
 &= b(a-1)+(a-1)(a+2) \\
 &= (a-1)(b+a+2) \\
 &= (a-1)(a+b+2)
 \end{aligned}$$

$$\begin{aligned}
 3-1 \quad a^2+2ab-3b^2-2a-6b &= (a-b)(a+3b)-2(a+3b) \\
 &= (a+3b)(a-b-2)
 \end{aligned}$$

$$\begin{aligned}
 3-2 \quad x^2-5xy+6y^2-x+2y &= (x-2y)(x-3y)-(x-2y) \\
 &= (x-2y)(x-3y-1)
 \end{aligned}$$

$$\begin{aligned}
 4-2 \quad a^2-6ab+9b^2+a-3b-2 &= (a-3b)^2+(a-3b)-2 \\
 &= A^2+A-2 \\
 &= (A+2)(A-1) \\
 &= (a-3b+2)(a-3b-1)
 \end{aligned}$$

$\left. \begin{array}{l} a-3b=A \text{로 치환} \\ \text{인수분해} \\ A=a-3b \text{를 대입} \end{array} \right\}$

18 인수분해 공식을 이용한 수의 계산

p. 160 ~ p. 161

1-1	43, 20, 300	1-2	640
2-1	3900	2-2	100
3-1	1, 1, 100, 9800	3-2	600
4-1	16200	4-2	9200
5-1	0.6	5-2	350
6-1	29, 900	6-2	10000
7-1	900	7-2	8100
8-1	4900	8-2	100
9-1	10000	9-2	2500
10-1	100	10-2	80
11-1	$6\sqrt{10}$	11-2	$10\sqrt{2}$

$$1-2 \quad 64 \times 43 - 64 \times 33 = 64(43-33) = 64 \times 10 = 640$$

$$2-1 \quad 39 \times 47 + 39 \times 53 = 39(47+53) = 39 \times 100 = 3900$$

$$2-2 \quad 25 \times 2.7 + 25 \times 1.3 = 25(2.7+1.3) = 25 \times 4 = 100$$

$$3-2 \quad 35^2 - 25^2 = (35+25)(35-25) = 60 \times 10 = 600$$

$$\begin{aligned}
 4-1 \quad 131^2 - 31^2 &= (131+31)(131-31) \\
 &= 162 \times 100 = 16200
 \end{aligned}$$

$$\begin{aligned}
 4-2 \quad 10 \times 51^2 - 10 \times 41^2 &= 10(51^2 - 41^2) \\
 &= 10(51+41)(51-41) \\
 &= 10 \times 92 \times 10 = 9200
 \end{aligned}$$

$$\begin{aligned}
 5-1 \quad 3 \times 1.05^2 - 3 \times 0.95^2 &= 3(1.05^2 - 0.95^2) \\
 &= 3(1.05+0.95)(1.05-0.95) \\
 &= 3 \times 2 \times 0.1 = 0.6
 \end{aligned}$$

$$\begin{aligned}
 5-2 \quad 7 \times 25.5^2 - 7 \times 24.5^2 &= 7(25.5^2 - 24.5^2) \\
 &= 7(25.5+24.5)(25.5-24.5) \\
 &= 7 \times 50 \times 1 = 350
 \end{aligned}$$

$$6-2 \quad 98^2 + 2 \times 98 \times 2 + 4 = (98+2)^2 = 100^2 = 10000$$

$$7-1 \quad 32^2 - 2 \times 32 \times 2 + 2^2 = (32-2)^2 = 30^2 = 900$$

$$7-2 \quad 97^2 - 2 \times 97 \times 7 + 49 = (97-7)^2 = 90^2 = 8100$$

$$8-1 \quad 74^2 - 2 \times 74 \times 4 + 4^2 = (74-4)^2 = 70^2 = 4900$$

$$8-2 \quad 8.5^2 + 2 \times 8.5 \times 1.5 + 1.5^2 = (8.5+1.5)^2 = 10^2 = 100$$

$$\begin{aligned}
 9-1 \quad 102^2 - 4 \times 102 + 4 &= 102^2 - 2 \times 102 \times 2 + 2^2 \\
 &= (102-2)^2 = 100^2 = 10000
 \end{aligned}$$

$$\begin{aligned}
 9-2 \quad 54^2 - 8 \times 54 + 4^2 &= 54^2 - 2 \times 54 \times 4 + 4^2 \\
 &= (54-4)^2 = 50^2 = 2500
 \end{aligned}$$

$$10-1 \quad \sqrt{82^2 + 2 \times 82 \times 18 + 18^2} = \sqrt{(82+18)^2} = \sqrt{100^2} = 100$$

$$10-2 \quad \sqrt{79^2 + 2 \times 79 + 1} = \sqrt{(79+1)^2} = \sqrt{80^2} = 80$$

$$11-1 \quad \sqrt{23^2 - 13^2} = \sqrt{(23+13)(23-13)} = \sqrt{36 \times 10} = 6\sqrt{10}$$

$$11-2 \quad \sqrt{51^2 - 49^2} = \sqrt{(51+49)(51-49)} = \sqrt{100 \times 2} = 10\sqrt{2}$$

19 인수분해 공식을 이용한 식의 값

p. 162 ~ p. 163

$$1-1 \quad 10000 \quad \text{연구} \quad 4$$

$$2-1 \quad 10300$$

$$3-1 \quad 3$$

$$4-1 \quad 5 - 3\sqrt{5}$$

$$5-1 \quad x+y, 85, 15, 7000$$

$$6-1 \quad 4\sqrt{10}$$

$$7-1 \quad 64$$

$$8-1 \quad -35$$

$$9-1 \quad 3 - 8\sqrt{3}$$

$$1-2 \quad 2500$$

$$2-2 \quad 995000$$

$$3-2 \quad 6$$

$$4-2 \quad 12 - 2\sqrt{3}$$

$$5-2 \quad 10000$$

$$6-2 \quad 12\sqrt{2}$$

$$7-2 \quad 12$$

$$8-2 \quad 2\sqrt{3}$$

$$9-2 \quad -4\sqrt{30}$$

$$1-2 \quad x^2 + 10x + 25 = (x+5)^2 \quad \left. \begin{array}{l} x=45 \text{를 대입} \\ \end{array} \right\} \\ = (45+5)^2 \\ = 50^2 = 2500$$

$$2-1 \quad x^2 - 7x + 10 = (x-2)(x-5) \quad \left. \begin{array}{l} x=105 \text{를 대입} \\ \end{array} \right\} \\ = (105-2)(105-5) \\ = 103 \times 100 \\ = 10300$$

$$2-2 \quad x^2 + x - 6 = (x-2)(x+3) \quad \left. \begin{array}{l} x=997 \text{를 대입} \\ \end{array} \right\} \\ = (997-2)(997+3) \\ = 995 \times 1000 = 995000$$

$$3-1 \quad x^2 - 4x + 4 = (x-2)^2 \quad \left. \begin{array}{l} x=2+\sqrt{3} \text{를 대입} \\ \end{array} \right\} \\ = (2+\sqrt{3}-2)^2 \\ = (\sqrt{3})^2 = 3$$

$$3-2 \quad x^2 + 2x + 1 = (x+1)^2 \quad \left. \begin{array}{l} x=\sqrt{6}-1 \text{를 대입} \\ \end{array} \right\} \\ = (\sqrt{6}-1+1)^2 \\ = (\sqrt{6})^2 = 6$$

$$4-1 \quad x^2 - x - 2 = (x+1)(x-2) \quad \left. \begin{array}{l} x=\sqrt{5}-1 \text{를 대입} \\ \end{array} \right\} \\ = (\sqrt{5}-1+1)(\sqrt{5}-1-2) \\ = \sqrt{5}(\sqrt{5}-3) = 5 - 3\sqrt{5}$$

$$4-2 \quad x^2 - 3x + 2 = (x-1)(x-2) \quad \left. \begin{array}{l} x=2\sqrt{3}+1 \text{를} \\ \text{대입} \end{array} \right\} \\ = (2\sqrt{3}+1-1)(2\sqrt{3}+1-2) \\ = 2\sqrt{3}(2\sqrt{3}-1) \\ = 12 - 2\sqrt{3}$$

$$5-2 \quad x^2 + 2xy + y^2 = (x+y)^2 \quad \left. \begin{array}{l} x=89, y=11 \text{를 대입} \\ \end{array} \right\} \\ = (89+11)^2 \\ = 100^2 = 10000$$

$$6-1 \quad x^2 - y^2 = (x+y)(x-y) \quad \left. \begin{array}{l} x=\sqrt{5}+\sqrt{2}, \\ y=\sqrt{5}-\sqrt{2} \text{를 대입} \end{array} \right\} \\ = \{(\sqrt{5}+\sqrt{2}) + (\sqrt{5}-\sqrt{2})\} \\ \times \{(\sqrt{5}+\sqrt{2}) - (\sqrt{5}-\sqrt{2})\} \\ = 2\sqrt{5} \times 2\sqrt{2} = 4\sqrt{10}$$

$$6-2 \quad x^2 - y^2 = (x+y)(x-y) \quad \left. \begin{array}{l} x=3+\sqrt{2}, \\ y=3-\sqrt{2} \text{를 대입} \end{array} \right\} \\ = \{(3+\sqrt{2}) + (3-\sqrt{2})\} \\ \times \{(3+\sqrt{2}) - (3-\sqrt{2})\} \\ = 6 \times 2\sqrt{2} = 12\sqrt{2}$$

$$7-1 \quad x^2 + 2xy + y^2 = (x+y)^2 \quad \left. \begin{array}{l} x=4+\sqrt{5}, \\ y=4-\sqrt{5} \text{를 대입} \end{array} \right\} \\ = (4+\sqrt{5}+4-\sqrt{5})^2 \\ = 8^2 = 64$$

$$7-2 \quad x^2 - 2xy + y^2 = (x-y)^2 \quad \left. \begin{array}{l} x=2+\sqrt{3}, \\ y=2-\sqrt{3} \text{를 대입} \end{array} \right\} \\ = \{(2+\sqrt{3}) - (2-\sqrt{3})\}^2 \\ = (2\sqrt{3})^2 = 12$$

$$8-1 \quad x^2 - xy - 2y^2 = (x+y)(x-2y) \quad \left. \begin{array}{l} x=5.5, y=4.5 \text{를 대입} \\ \end{array} \right\} \\ = (5.5+4.5)(5.5-2 \times 4.5) \\ = 10 \times (-3.5) = -35$$

$$8-2 \quad x^2y - xy^2 = xy(x-y) \quad \left. \begin{array}{l} x=2+\sqrt{3}, \\ y=2-\sqrt{3} \text{를 대입} \end{array} \right\} \\ = (2+\sqrt{3})(2-\sqrt{3}) \\ \times \{(2+\sqrt{3}) - (2-\sqrt{3})\} \\ = (4-3) \times 2\sqrt{3} = 2\sqrt{3}$$

$$9-1 \quad x = \frac{1}{2-\sqrt{3}} = \frac{2+\sqrt{3}}{(2-\sqrt{3})(2+\sqrt{3})} = 2+\sqrt{3} \\ x^2 - 12x + 20 = (x-2)(x-10) \quad \left. \begin{array}{l} x=2+\sqrt{3} \text{를 대입} \\ \end{array} \right\} \\ = (2+\sqrt{3}-2)(2+\sqrt{3}-10) \\ = \sqrt{3}(\sqrt{3}-8) \\ = 3 - 8\sqrt{3}$$

$$\begin{aligned}
 9-2 \quad x &= \frac{1}{\sqrt{6}+\sqrt{5}} = \frac{\sqrt{6}-\sqrt{5}}{(\sqrt{6}+\sqrt{5})(\sqrt{6}-\sqrt{5})} = \sqrt{6}-\sqrt{5} \\
 y &= \frac{1}{\sqrt{6}-\sqrt{5}} = \frac{\sqrt{6}+\sqrt{5}}{(\sqrt{6}-\sqrt{5})(\sqrt{6}+\sqrt{5})} = \sqrt{6}+\sqrt{5} \\
 x^2-y^2 &= (x+y)(x-y) \\
 &= \{(\sqrt{6}-\sqrt{5})+(\sqrt{6}+\sqrt{5})\} \left[\begin{array}{l} x=\sqrt{6}-\sqrt{5}, \\ y=\sqrt{6}+\sqrt{5} \text{를 대입} \end{array} \right] \\
 &\quad \times \{(\sqrt{6}-\sqrt{5})-(\sqrt{6}+\sqrt{5})\} \\
 &= 2\sqrt{6} \times (-2\sqrt{5}) = -4\sqrt{30}
 \end{aligned}$$

STEP 2

기본연산 집중연습 | 13~19

p. 164 ~ p. 165

1-1	$3y(x+1)(x+3)$	1-2	$(a+b-1)^2$
1-3	$(x+1)(x+7)$	1-4	$-(x+5)(5x+3)$
1-5	$2(x-1)(6x-1)$	1-6	$(x+y-1)(x+y-3)$
2-1	$(x+1)(y+1)$	2-2	$(x-4)(y-1)$
2-3	$(x+y+3)(x+y-3)$	2-4	$(3x+y+1)(3x-y+1)$
2-5	$(x-2y)(x+2y-1)$	2-6	$(a+b+c)(a-b-c)$
2-7	$(x+2)(x-2)(x+3)$	2-8	$(a-3)(2a+b+1)$
3-1	160	3-2	1700
3-3	199	3-4	40
3-5	400	3-6	5000
4-1	39	4-2	2
4-3	16	4-4	$4\sqrt{6}$
4-5	3	4-6	-2

$$1-1 \quad 3x^2y+12xy+9y=3y(x^2+4x+3)=3y(x+1)(x+3)$$

$$\begin{aligned}
 1-2 \quad a+b &= A \text{로 치환하면} \\
 (a+b)^2-2(a+b)+1 &= A^2-2A+1 = (A-1)^2 \\
 &= (a+b-1)^2
 \end{aligned}$$

$$\begin{aligned}
 1-3 \quad x+2 &= A \text{로 치환하면} \\
 (x+2)^2+4(x+2)-5 &= A^2+4A-5 \\
 &= (A-1)(A+5) \\
 &= (x+2-1)(x+2+5) \\
 &= (x+1)(x+7)
 \end{aligned}$$

$$\begin{aligned}
 1-4 \quad 2x-1 &= A, \quad 3x+4=B \text{로 치환하면} \\
 (2x-1)^2-(3x+4)^2 &= A^2-B^2 \\
 &= (A+B)(A-B) \\
 &= \{(2x-1)+(3x+4)\} \{(2x-1)-(3x+4)\} \\
 &= (5x+3)(-x-5) \\
 &= -(x+5)(5x+3)
 \end{aligned}$$

$$\begin{aligned}
 1-5 \quad 2x-1 &= A \text{로 치환하면} \\
 3(2x-1)^2+(1-2x)-2 &= 3(2x-1)^2-(2x-1)-2 \\
 &= 3A^2-A-2 = (A-1)(3A+2) \\
 &= (2x-1-1)\{3(2x-1)+2\} \\
 &= (2x-2)(6x-1) = 2(x-1)(6x-1)
 \end{aligned}$$

$$\begin{aligned}
 1-6 \quad x+y &= A \text{로 치환하면} \\
 (x+y)(x+y-4)+3 &= A(A-4)+3 \\
 &= A^2-4A+3 \\
 &= (A-1)(A-3) \\
 &= (x+y-1)(x+y-3)
 \end{aligned}$$

$$2-1 \quad xy+y+x+1=y(x+1)+x+1=(x+1)(y+1)$$

$$\begin{aligned}
 2-2 \quad xy-4y+4-x &= y(x-4)-(x-4) \\
 &= (x-4)(y-1)
 \end{aligned}$$

$$\begin{aligned}
 2-3 \quad x^2+2xy+y^2-9 &= (x^2+2xy+y^2)-9 \\
 &= (x+y)^2-3^2 \\
 &= (x+y+3)(x+y-3)
 \end{aligned}$$

$$\begin{aligned}
 2-4 \quad 9x^2-y^2+6x+1 &= (9x^2+6x+1)-y^2 \\
 &= (3x+1)^2-y^2 \\
 &= (3x+1+y)(3x+1-y) \\
 &= (3x+y+1)(3x-y+1)
 \end{aligned}$$

$$\begin{aligned}
 2-5 \quad x^2-4y^2-x+2y &= (x^2-4y^2)-(x-2y) \\
 &= (x+2y)(x-2y)-(x-2y) \\
 &= (x-2y)(x+2y-1)
 \end{aligned}$$

$$\begin{aligned}
 2-6 \quad a^2-b^2-c^2-2bc &= a^2-(b^2+2bc+c^2) \\
 &= a^2-(b+c)^2 \\
 &= (a+b+c)\{a-(b+c)\} \\
 &= (a+b+c)(a-b-c)
 \end{aligned}$$

$$\begin{aligned}
 2-7 \quad x^3+3x^2-4x-12 &= x^2(x+3)-4(x+3) \\
 &= (x+3)(x^2-4) \\
 &= (x+3)(x+2)(x-2) \\
 &= (x+2)(x-2)(x+3)
 \end{aligned}$$

$$\begin{aligned}
 2-8 \quad 2a^2+ab-5a-3b-3 &= ab-3b+2a^2-5a-3 \\
 &= b(a-3)+(a-3)(2a+1) \\
 &= (a-3)(b+2a+1) \\
 &= (a-3)(2a+b+1)
 \end{aligned}$$

3-1 $16 \times 7 + 16 \times 3 = 16(7+3) = 16 \times 10 = 160$

3-2 $17 \times 47 + 17 \times 53 = 17(47+53) = 17 \times 100 = 1700$

3-3 $100^2 - 99^2 = (100+99)(100-99) = 199 \times 1 = 199$

3-4 $\sqrt{58^2 - 42^2} = \sqrt{(58+42)(58-42)} = \sqrt{100 \times 16} = 40$

3-5 $21^2 - 2 \times 21 + 1 = (21-1)^2 = 20^2 = 400$

3-6 $60^2 \times 2.5 - 40^2 \times 2.5 = 2.5(60^2 - 40^2)$
 $= 2.5(60+40)(60-40)$
 $= 2.5 \times 100 \times 20$
 $= 5000$

4-1 $\sqrt{x^2 - 6x + 9} = \sqrt{(x-3)^2}$
 $= \sqrt{(42-3)^2}$ $\leftarrow x=42$ 를 대입
 $= \sqrt{39^2} = 39$

4-2 $x^2 + 2x + 1 = (x+1)^2$
 $= (\sqrt{2}-1+1)^2$ $\leftarrow x=\sqrt{2}-1$ 을 대입
 $= (\sqrt{2})^2 = 2$

4-3 $x^2 + 2xy + y^2$
 $= (x+y)^2$
 $= (2-\sqrt{5}+2+\sqrt{5})^2$ $\leftarrow x=2-\sqrt{5}, y=2+\sqrt{5}$ 를 대입
 $= 4^2 = 16$

4-4 $x^2 - y^2$
 $= (x+y)(x-y)$
 $= (\sqrt{3}+\sqrt{2}+\sqrt{3}-\sqrt{2})$
 $\times \{(\sqrt{3}+\sqrt{2}) - (\sqrt{3}-\sqrt{2})\}$ $\leftarrow x=\sqrt{3}+\sqrt{2}, y=\sqrt{3}-\sqrt{2}$ 를 대입
 $= 2\sqrt{3} \times 2\sqrt{2} = 4\sqrt{6}$

4-5 $x = \frac{1}{2+\sqrt{3}} = 2-\sqrt{3}$ 이므로
 $x^2 - 4x + 4 = (x-2)^2 = (2-\sqrt{3}-2)^2 = (-\sqrt{3})^2 = 3$

4-6 $x = \frac{1}{\sqrt{2}+1} = \sqrt{2}-1, y = \frac{1}{\sqrt{2}-1} = \sqrt{2}+1$ 이므로
 $x^2y - xy^2 = xy(x-y)$
 $= (\sqrt{2}-1)(\sqrt{2}+1)\{(\sqrt{2}-1) - (\sqrt{2}+1)\}$
 $= (2-1) \times (-2) = -2$

STEP 3

기본연산 테스트

p. 166 ~ p. 167

- (1) ○ (2) ○ (3) ○ (4) ×
- (1) $xy(4x+7)$ (2) $2a(ab^2-b+1)$ (3) $(x-6)^2$
 (4) $(4a-5b)^2$ (5) $(y+5x)(y-5x)$
 (6) $\frac{1}{3}\left(x+\frac{1}{2}y\right)\left(x-\frac{1}{2}y\right)$
- (1) $2x+4$ (2) a^2+4
- (1) 49 (2) 16 (3) 40 (4) $\frac{1}{2}$
- (1) $4(x-3)(x+7)$ (2) $(a+2b)(a-5b)$
 (3) $(2x+3)(5x-4)$ (4) $(3x-2y)(6x-y)$
 (5) $(a-2)(8a+3)$
- (1) $(x+9)(x+3)$ (2) $y(x-2)(5x+4)$
 (3) $(x+y+2)(x-y+2)$ (4) $(x+y-4)(x-y+4)$
 (5) $(2x-3y-5)^2$ (6) $(x-2)(x-3y-3)$
- (1) ㉠, 9200 (2) ㉡, 64 (3) ㉢, 10000 (4) ㉣, 62.8
- (1) 8100 (2) $-5\sqrt{2}+2$ (3) $24\sqrt{2}$

1 (4) $a^2b+ab^2=ab(a+b)$ 의 인수는
 $1, a, b, ab, a+b, a(a+b), b(a+b), \frac{ab(a+b)}{a^2b+ab^2}$

3 (2) $2a^2-8=2(a^2-4)=2(a+2)(a-2)$

6 (1) $x+6=A$ 로 치환하면
 $(x+6)^2-9=A^2-9=(A+3)(A-3)$
 $= (x+6+3)(x+6-3)$
 $= (x+9)(x+3)$
 (2) $5x^2y-6xy-8y=y(5x^2-6x-8)$
 $= y(x-2)(5x+4)$
 (3) $x^2+4x+4-y^2=(x+2)^2-y^2$
 $= (x+2+y)(x+2-y)$
 $= (x+y+2)(x-y+2)$
 (4) $x^2-y^2+8y-16=x^2-(y^2-8y+16)$
 $= x^2-(y-4)^2$
 $= (x+y-4)(x-y+4)$

(5) $2x-3y=A$ 로 치환하면
 $(2x-3y)(2x-3y-10)+25$
 $= A(A-10)+25$
 $= A^2-10A+25$
 $= (A-5)^2$
 $= (2x-3y-5)^2$
 (6) $x^2-3xy-5x+6y+6$
 $= -3xy+6y+x^2-5x+6$
 $= -3y(x-2)+(x-2)(x-3)$
 $= (x-2)(x-3y-3)$