

중학 연간의 빅데이터

빅터 연산



정답과 해설

2A

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1 유리수와 순환소수

STEP 1

01 유리수

p. 6

- 1 (1) $\frac{8}{4}, 5$ (2) $\frac{8}{4}, 0, -1, 5$
 (3) $-3, 2, 1, 5, -\frac{2}{3}, \frac{2}{5}$
 (4) $\frac{8}{4}, 5, 1, 5, \frac{2}{5}$ (5) $-3, 2, -1, -\frac{2}{3}$
 (6) $-3, 2, \frac{8}{4}, 0, -1, 5, 1, 5, -\frac{2}{3}, \frac{2}{5}$
- 2 (1) $3, 1$ (2) $-8, 3, -\frac{15}{5}, 1$
 (3) $0, 4, -\frac{3}{4}, 3, 14, \frac{4}{7}$
 (4) $0, 4, 3, 3, 14, 1, \frac{4}{7}$ (5) $-8, -\frac{15}{5}, -\frac{3}{4}$
 (6) $0, 4, -8, 3, -\frac{15}{5}, -\frac{3}{4}, 3, 14, 1, \frac{4}{7}$

02 유한소수와 무한소수

p. 7

- | | |
|------|------|
| 1 무 | 2 유 |
| 3 무 | 4 유 |
| 5 유 | 6 무 |
| 7 유 | 8 무 |
| 9 유 | 10 무 |
| 11 무 | 12 유 |

03 분수를 유한소수 또는 무한소수로 나타내기

p. 8

- | | |
|----------------|-------------------|
| 1 4, 2.5, 유 | 2 0.375, 유 |
| 3 0.2, 유 | 4 0.666..., 무 |
| 5 0.625, 유 | 6 0.222..., 무 |
| 7 1.1666..., 무 | 8 0.8, 유 |
| 9 1.25, 유 | 10 0.272727..., 무 |

04 순환소수

p. 9

- | | |
|--------|------|
| 1 4, ○ | 2 ○ |
| 3 × | 4 ○ |
| 5 × | 6 ○ |
| 7 ○ | 8 ○ |
| 9 × | 10 ○ |
| 11 ○ | 12 × |

05 순환소수의 표현

p. 10 ~ p. 12

- | | |
|---|---|
| 1 4, 0. $\dot{4}$ | 2 8, 1. $\dot{8}$ |
| 3 3, 0. $\dot{2}\dot{3}$ | 4 2, 1. $\dot{4}\dot{2}$ |
| 5 12, 0. $\dot{1}\dot{2}$ | 6 45, 3. $\dot{4}\dot{5}$ |
| 7 95, 0. $\dot{0}\dot{9}\dot{5}$ | 8 36, 1. $\dot{0}\dot{3}\dot{6}$ |
| 9 3, 0. $\dot{5}\dot{8}\dot{3}$ | 10 21, 1. $\dot{2}\dot{1}$ |
| 11 123, 0. $\dot{1}\dot{2}\dot{3}$ | 12 01, 1. $\dot{0}\dot{1}$ |
| 13 026, 3. $\dot{1}\dot{0}\dot{2}\dot{6}$ | 14 342, 2. $\dot{1}\dot{3}\dot{4}\dot{2}$ |
| 15 198, 5. $\dot{1}\dot{9}\dot{8}$ | 16 2, 0. $\dot{1}\dot{4}\dot{2}$ |
| 17 12, 4. $\dot{0}\dot{1}\dot{2}$ | 18 010, 0. $\dot{0}\dot{1}\dot{0}$ |
| 19 10, 2 | 20 6 |
| 21 5, 0 | 22 3 |
| 23 3 | 24 4 |

20 순환소수 $0.\dot{3}\dot{6}$ 의 순환마디의 숫자의 개수는 3, 6의 2개이므로 $50 = 2 \times 25$
 따라서 소수점 아래 50번째 자리의 숫자는 순환마디가 25번 반복되고 순환마디의 2번째 숫자인 6이다.

22 순환소수 $0.\dot{3}\dot{6}\dot{9}$ 의 순환마디의 숫자의 개수는 3, 6, 9의 3개이므로 $34 = 3 \times 11 + 1$
 따라서 소수점 아래 34번째 자리의 숫자는 순환마디가 11번 반복되고 순환마디의 1번째 숫자인 3이다.

23 순환소수 $0.\dot{1}\dot{2}\dot{3}$ 의 순환마디의 숫자의 개수는 1, 2, 3의 3개이므로 $30 = 3 \times 10$
 따라서 소수점 아래 30번째 자리의 숫자는 순환마디가 10번 반복되고 순환마디의 3번째 숫자인 3이다.

24 순환소수 $0.\dot{4}\dot{9}$ 의 순환마디의 숫자의 개수는 4, 9의 2개이므로 $25 = 2 \times 12 + 1$
 따라서 소수점 아래 25번째 자리의 숫자는 순환마디가 12번 반복되고 순환마디의 1번째 숫자인 4이다.

06 분수를 순환소수로 나타내기

p. 13

- 1 $0.133\cdots$, $3, 0.\dot{1}\dot{3}$ 2 $0.9166\cdots$, $6, 0.91\dot{6}$
 3 $2.6363\cdots$, $63, 2.\dot{6}\dot{3}$ 4 $0.108108\cdots$, $108, 0.\dot{1}0\dot{8}$

1	$0.133\cdots$	2	$0.9166\cdots$
	$15 \overline{)2}$		$12 \overline{)11}$
	$\underline{15}$		$\underline{108}$
	50		20
	$\underline{45}$		$\underline{12}$
	50		80
	$\underline{45}$		$\underline{72}$
	5		80
	$\vdots$		$\underline{72}$
			8
			$\vdots$
3	$2.6363\cdots$	4	$0.108108\cdots$
	$11 \overline{)29}$		$37 \overline{)4}$
	$\underline{22}$		$\underline{37}$
	70		300
	$\underline{66}$		$\underline{296}$
	40		40
	$\underline{33}$		$\underline{37}$
	70		300
	$\underline{66}$		$\underline{296}$
	40		4
	$\underline{33}$		$\vdots$
	7		
	$\vdots$		

STEP 2

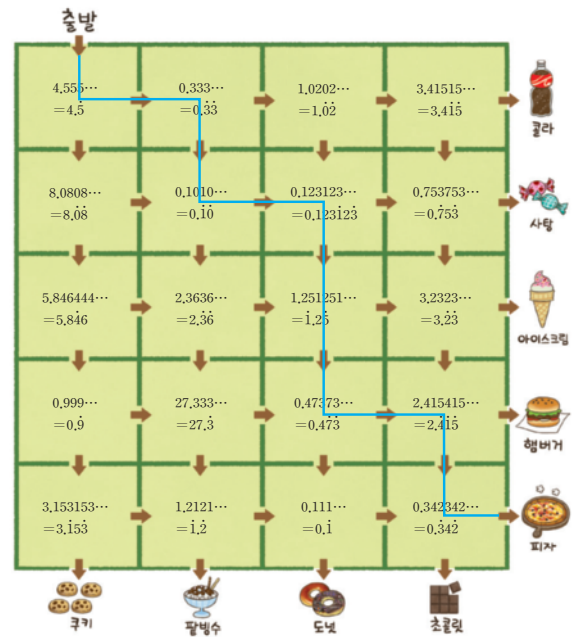
기본연산 집중연습 | 01~06

p. 14 ~ p. 15

- 1 유 2 무
 3 무 4 유
 5 유 6 무
 7 무 8 유
 9 $0.55\cdots$, $0.\dot{5}$ 10 $0.0833\cdots$, $0.08\dot{3}$
 11 $0.054054\cdots$, $0.\dot{0}5\dot{4}$ 12 $0.166\cdots$, $0.1\dot{6}$
 13 피자

- 5 $\frac{1}{4} = 0.25$ 6 $\frac{1}{3} = 0.333\cdots$
 7 $\frac{2}{7} = 0.285714\cdots$ 8 $\frac{3}{5} = 0.6$

13



STEP 1

07 유한소수를 기약분수로 나타내기

p. 16

- 1 $5, \frac{7}{10}, 2, 5$ 2 $\frac{31}{100}, 2, 5$
 3 $\frac{3}{5}, 5$ 4 $\frac{4}{25}, 5$
 5 $\frac{3}{100}, 2, 5$ 6 $\frac{1}{4}, 2$
 7 $\frac{1}{8}, 2$ 8 $\frac{99}{200}, 2, 5$

$$2 \quad 0.31 = \frac{31}{100} = \frac{31}{2^2 \times 5^2}$$

$$3 \quad 0.6 = \frac{6}{10} = \frac{3}{5}$$

$$4 \quad 0.16 = \frac{16}{100} = \frac{4}{25} = \frac{4}{5^2}$$

$$5 \quad 0.03 = \frac{3}{100} = \frac{3}{2^2 \times 5^2}$$

$$6 \quad 0.25 = \frac{25}{100} = \frac{1}{4} = \frac{1}{2^2}$$

$$7 \quad 0.125 = \frac{125}{1000} = \frac{1}{8} = \frac{1}{2^3}$$

$$8 \quad 0.495 = \frac{495}{1000} = \frac{99}{200} = \frac{99}{2^3 \times 5^2}$$

08 10의 거듭제곱을 이용하여 분수를 소수로 나타내기 p. 17 ~ p. 18

1 5, 15, 1.5	2 5, 5, 35, 0.35
3 2, 2, 100, 0.14	4 $5^2, 5^2, 75, 0.075$
5 $2^2, 2^2, 28, 0.28$	6 5, 5, 55, 0.55
7 $3, 5^2, 5^2, 75, 0.75$	8 50, 2, 2, 18, 0.18
9 1.25	10 0.24
11 0.8	12 0.325
13 0.45	14 0.22
15 0.1	16 0.4
17 0.125	18 0.16
19 0.2	20 0.175

$$9 \quad \frac{5}{4} = \frac{5}{2^2} = \frac{5 \times 5^2}{2^2 \times 5^2} = \frac{125}{100} = 1.25$$

$$10 \quad \frac{6}{25} = \frac{6}{5^2} = \frac{6 \times 2^2}{5^2 \times 2^2} = \frac{24}{100} = 0.24$$

$$11 \quad \frac{12}{15} = \frac{4}{5} = \frac{4 \times 2}{5 \times 2} = \frac{8}{10} = 0.8$$

$$12 \quad \frac{13}{40} = \frac{13}{2^3 \times 5} = \frac{13 \times 5^2}{2^3 \times 5 \times 5^2} \\ = \frac{325}{1000} = 0.325$$

$$13 \quad \frac{9}{20} = \frac{9}{2^2 \times 5} = \frac{9 \times 5}{2^2 \times 5 \times 5} \\ = \frac{45}{100} = 0.45$$

$$14 \quad \frac{11}{50} = \frac{11}{2 \times 5^2} = \frac{11 \times 2}{2 \times 5^2 \times 2} \\ = \frac{22}{100} = 0.22$$

$$15 \quad \frac{11}{110} = \frac{1}{10} = 0.1$$

$$16 \quad \frac{14}{35} = \frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10} = 0.4$$

$$17 \quad \frac{3}{24} = \frac{1}{8} = \frac{1}{2^3} = \frac{5^3}{2^3 \times 5^3} \\ = \frac{125}{1000} = 0.125$$

$$18 \quad \frac{12}{75} = \frac{4}{25} = \frac{4}{5^2} = \frac{4 \times 2^2}{5^2 \times 2^2} \\ = \frac{16}{100} = 0.16$$

$$19 \quad \frac{15}{75} = \frac{1}{5} = \frac{2}{5 \times 2} = \frac{2}{10} = 0.2$$

$$20 \quad \frac{21}{120} = \frac{7}{40} = \frac{7}{2^3 \times 5} = \frac{7 \times 5^2}{2^3 \times 5 \times 5^2} \\ = \frac{175}{1000} = 0.175$$

09 유한소수로 나타낼 수 있는 분수 p. 19 ~ p. 21

1 2, 5, 있다	2 3, 없다
3 2, 5, 있다	4 2, 3, 없다
5 $5^2, 5$, 있다	6 3, 2, 3, 없다
7 5, 2, 3, 5, 없다	8 2, 2, 5, 있다
9 ○	10 ×
11 ○	12 ○
13 ×	14 ×
15 ×	16 ○
17 ○	18 ×
19 ○	20 ○
21 ○	22 ○
23 ○	24 ×
25 ○	26 ×
27 ×	28 ×
29 ○	30 ×
31 ○	32 ○

$$11 \quad \frac{9}{2 \times 3 \times 5} = \frac{3}{2 \times 5} \Rightarrow \text{유한소수}$$

$$12 \quad \frac{26}{2 \times 5 \times 13} = \frac{1}{5} \Rightarrow \text{유한소수}$$

$$13 \quad \frac{3}{3^2 \times 5} = \frac{1}{3 \times 5} \\ \Rightarrow \text{분모의 소인수 중에 3이 있으므로 유한소수로 나타낼 수 없다.}$$

$$14 \quad \frac{14}{2 \times 3 \times 7^2} = \frac{1}{3 \times 7} \\ \Rightarrow \text{분모의 소인수가 3과 7이므로 유한소수로 나타낼 수 없다.}$$

$$15 \quad \frac{15}{3^2 \times 5^2} = \frac{1}{3 \times 5} \\ \Rightarrow \text{분모의 소인수 중에 3이 있으므로 유한소수로 나타낼 수 없다.}$$

$$16 \quad \frac{21}{2^2 \times 5 \times 7} = \frac{3}{2^2 \times 5} \Rightarrow \text{유한소수}$$

$$17 \quad \frac{12}{2 \times 3 \times 5^2} = \frac{2}{5^2} \Rightarrow \text{유한소수}$$

$$18 \quad \frac{35}{2^2 \times 3 \times 7} = \frac{5}{2^2 \times 3} \\ \Rightarrow \text{분모의 소인수 중에 3이 있으므로 유한소수로 나타낼 수 없다.}$$

19 $\frac{28}{2^2 \times 5 \times 7} = \frac{1}{5} \Rightarrow$ 유한소수

20 $\frac{18}{2^3 \times 3^2} = \frac{1}{2^2} \Rightarrow$ 유한소수

21 $\frac{13}{20} = \frac{13}{2^2 \times 5} \Rightarrow$ 유한소수

22 $\frac{6}{30} = \frac{1}{5} \Rightarrow$ 유한소수

23 $\frac{12}{40} = \frac{3}{10} = \frac{3}{2 \times 5} \Rightarrow$ 유한소수

24 $\frac{49}{210} = \frac{7}{30} = \frac{7}{2 \times 3 \times 5}$
 $\Rightarrow$ 분모의 소인수 중에 3이 있으므로 유한소수로 나타낼 수 없다.

25 $\frac{21}{35} = \frac{3}{5} \Rightarrow$ 유한소수

26 $\frac{17}{33} = \frac{17}{3 \times 11}$
 $\Rightarrow$ 분모의 소인수가 3과 11이므로 유한소수로 나타낼 수 없다.

27 $\frac{6}{45} = \frac{2}{15} = \frac{2}{3 \times 5}$
 $\Rightarrow$ 분모의 소인수 중에 3이 있으므로 유한소수로 나타낼 수 없다.

28 $\frac{3}{42} = \frac{1}{14} = \frac{1}{2 \times 7}$
 $\Rightarrow$ 분모의 소인수 중에 7이 있으므로 유한소수로 나타낼 수 없다.

29 $\frac{18}{150} = \frac{3}{25} = \frac{3}{5^2} \Rightarrow$ 유한소수

30 $\frac{10}{28} = \frac{5}{14} = \frac{5}{2 \times 7}$
 $\Rightarrow$ 분모의 소인수 중에 7이 있으므로 유한소수로 나타낼 수 없다.

31 $\frac{9}{75} = \frac{3}{25} = \frac{3}{5^2} \Rightarrow$ 유한소수

32 $\frac{15}{120} = \frac{1}{8} = \frac{1}{2^3} \Rightarrow$ 유한소수

STEP 2

기본연산 집중연습 | 07~09

p. 22 ~ p. 23

- | | |
|---------------------------|-------------------------|
| 1 2, 2, 6, 0.6 | 2 $5^2, 5^2, 25, 0.25$ |
| 3 $2^2, 2^2, 16, 0.16$ | 4 2, 2, 26, 0.26 |
| 5 $5^2, 5^2, 1000, 0.175$ | 6 5, 5, 15, 1000, 0.015 |
| 7 ○ | 8 ○ |
| 9 × | 10 × |
| 11 ○ | 12 ○ |
| 13 ○ | 14 ○ |
| 15 C | |

7 $\frac{9}{20} = \frac{9}{2^2 \times 5} \Rightarrow$ 유한소수

8 $\frac{22}{2^2 \times 5 \times 11} = \frac{1}{2 \times 5} \Rightarrow$ 유한소수

9 $\frac{12}{2^2 \times 3^2 \times 5} = \frac{1}{3 \times 5}$
 $\Rightarrow$ 분모의 소인수 중에 3이 있으므로 유한소수로 나타낼 수 없다.

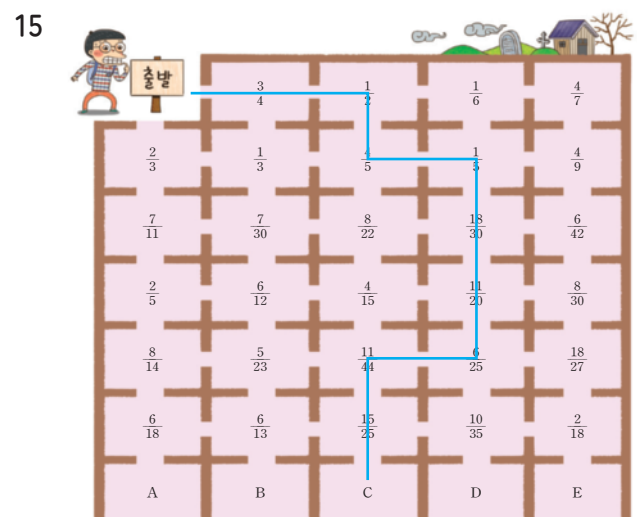
10 $\frac{6}{63} = \frac{2}{21} = \frac{2}{3 \times 7}$
 $\Rightarrow$ 분모의 소인수가 3과 7이므로 유한소수로 나타낼 수 없다.

11 $\frac{15}{48} = \frac{5}{16} = \frac{5}{2^4} \Rightarrow$ 유한소수

12 $\frac{3 \times 11}{2^3 \times 3 \times 5} = \frac{11}{2^3 \times 5} \Rightarrow$ 유한소수

13 $\frac{49}{2 \times 5^2 \times 7} = \frac{7}{2 \times 5^2} \Rightarrow$ 유한소수

14 $\frac{11}{220} = \frac{1}{20} = \frac{1}{2^2 \times 5} \Rightarrow$ 유한소수



STEP 1

10 순환소수를 분수로 나타내기 (1): 원리 ① p. 24 ~ p. 25

- | | | | |
|----|-----------------------------|----|--|
| 1 | $10, 6, 6, \frac{2}{3}$ | 2 | $12, 222\cdots, 11, \frac{11}{9}$ |
| 3 | $100, 15, 15, \frac{5}{33}$ | 4 | $124, 2424\cdots, 123, 123, \frac{41}{33}$ |
| 5 | $\frac{8}{9}$ | 6 | $\frac{4}{3}$ |
| 7 | $\frac{32}{99}$ | 8 | $\frac{6}{11}$ |
| 9 | $\frac{52}{33}$ | 10 | $\frac{229}{99}$ |
| 11 | $\frac{365}{999}$ | 12 | $\frac{2123}{999}$ |

- 5 $0.\dot{8}$ 을 x 라 하면 $x=0.888\cdots$
 $10x=8.888\cdots$ 이므로
 $10x=8.888\cdots$
 $-) \quad x=0.888\cdots$
 $9x=8$
 $\therefore x=\frac{8}{9}$
- 6 $1.\dot{3}$ 을 x 라 하면 $x=1.333\cdots$
 $10x=13.333\cdots$ 이므로
 $10x=13.333\cdots$
 $-) \quad x=1.333\cdots$
 $9x=12$
 $\therefore x=\frac{12}{9}=\frac{4}{3}$
- 7 $0.\dot{3}\dot{2}$ 를 x 라 하면 $x=0.3232\cdots$
 $100x=32.3232\cdots$ 이므로
 $100x=32.3232\cdots$
 $-) \quad x=0.3232\cdots$
 $99x=32$
 $\therefore x=\frac{32}{99}$
- 8 $0.\dot{5}\dot{4}$ 를 x 라 하면 $x=0.5454\cdots$
 $100x=54.5454\cdots$ 이므로
 $100x=54.5454\cdots$
 $-) \quad x=0.5454\cdots$
 $99x=54$
 $\therefore x=\frac{54}{99}=\frac{6}{11}$
- 9 $1.\dot{5}\dot{7}$ 을 x 라 하면 $x=1.5757\cdots$
 $100x=157.5757\cdots$ 이므로
 $100x=157.5757\cdots$
 $-) \quad x=1.5757\cdots$
 $99x=156$
 $\therefore x=\frac{156}{99}=\frac{52}{33}$

- 10 $2.\dot{3}\dot{1}$ 을 x 라 하면 $x=2.3131\cdots$
 $100x=231.3131\cdots$ 이므로
 $100x=231.3131\cdots$
 $-) \quad x=2.3131\cdots$
 $99x=229$
 $\therefore x=\frac{229}{99}$
- 11 $0.\dot{3}\dot{6}\dot{5}$ 를 x 라 하면 $x=0.365365\cdots$
 $1000x=365.365365\cdots$ 이므로
 $1000x=365.365365\cdots$
 $-) \quad x=0.365365\cdots$
 $999x=365$
 $\therefore x=\frac{365}{999}$
- 12 $2.\dot{1}\dot{2}\dot{5}$ 를 x 라 하면 $x=2.125125\cdots$
 $1000x=2125.125125\cdots$ 이므로
 $1000x=2125.125125\cdots$
 $-) \quad x=2.125125\cdots$
 $999x=2123$
 $\therefore x=\frac{2123}{999}$

11 순환소수를 분수로 나타내기 (2): 원리 ② p. 26 ~ p. 28

- | | | | |
|----|--|----|--------------------|
| 1 | $10, 100, 90, 90, \frac{1}{6}$ | | |
| 2 | $3.555\cdots, 35.555\cdots, 32, 32, \frac{16}{45}$ | | |
| 3 | $1000, 1000, 990, 990, \frac{71}{110}$ | | |
| 4 | $10, 10, 990, \frac{1231}{990}$ | | |
| 5 | $\frac{41}{30}$ | 6 | $\frac{58}{45}$ |
| 7 | $\frac{61}{495}$ | 8 | $\frac{214}{495}$ |
| 9 | $\frac{69}{55}$ | 10 | $\frac{1066}{495}$ |
| 11 | $\frac{73}{225}$ | 12 | $\frac{121}{450}$ |
- 13 (1) ㉠ (2) ㉡ (3) ㉢ (4) ㉣ (5) ㉤ (6) ㉥
- 14 (1) ㉠ (2) ㉡ (3) ㉢ (4) ㉣ (5) ㉣ (6) ㉥

- 5 $1.\dot{3}\dot{6}$ 을 x 라 하면 $x=1.3666\cdots$
 $10x=13.666\cdots$
 $100x=136.666\cdots$ 이므로
 $100x=136.666\cdots$
 $-) 10x=13.666\cdots$
 $90x=123$
 $\therefore x=\frac{123}{90}=\frac{41}{30}$
- 6 $1.2\dot{8}$ 을 x 라 하면 $x=1.2888\cdots$
 $10x=12.888\cdots$
 $100x=128.888\cdots$ 이므로
 $100x=128.888\cdots$
 $-) 10x=12.888\cdots$
 $90x=116$
 $\therefore x=\frac{116}{90}=\frac{58}{45}$
- 7 $0.1\dot{2}\dot{3}$ 을 x 라 하면 $x=0.12323\cdots$
 $10x=1.2323\cdots$
 $1000x=123.2323\cdots$ 이므로
 $1000x=123.2323\cdots$
 $-) 10x=1.2323\cdots$
 $990x=122$
 $\therefore x=\frac{122}{990}=\frac{61}{495}$
- 8 $0.4\dot{3}\dot{2}$ 를 x 라 하면 $x=0.43232\cdots$
 $10x=4.3232\cdots$
 $1000x=432.3232\cdots$ 이므로
 $1000x=432.3232\cdots$
 $-) 10x=4.3232\cdots$
 $990x=428$
 $\therefore x=\frac{428}{990}=\frac{214}{495}$
- 9 $1.2\dot{5}\dot{4}$ 를 x 라 하면 $x=1.25454\cdots$
 $10x=12.5454\cdots$
 $1000x=1254.5454\cdots$ 이므로
 $1000x=1254.5454\cdots$
 $-) 10x=12.5454\cdots$
 $990x=1242$
 $\therefore x=\frac{1242}{990}=\frac{69}{55}$
- 10 $2.1\dot{5}\dot{3}$ 을 x 라 하면 $x=2.15353\cdots$
 $10x=21.5353\cdots$
 $1000x=2153.5353\cdots$ 이므로
 $1000x=2153.5353\cdots$
 $-) 10x=21.5353\cdots$
 $990x=2132$
 $\therefore x=\frac{2132}{990}=\frac{1066}{495}$

- 11 $0.3\dot{2}\dot{4}$ 를 x 라 하면 $x=0.32444\cdots$
 $100x=32.444\cdots$
 $1000x=324.444\cdots$ 이므로
 $1000x=324.444\cdots$
 $-) 100x=32.444\cdots$
 $900x=292$
 $\therefore x=\frac{292}{900}=\frac{73}{225}$
- 12 $0.2\dot{6}\dot{8}$ 을 x 라 하면 $x=0.26888\cdots$
 $100x=26.888\cdots$
 $1000x=268.888\cdots$ 이므로
 $1000x=268.888\cdots$
 $-) 100x=26.888\cdots$
 $900x=242$
 $\therefore x=\frac{242}{900}=\frac{121}{450}$

12 순환소수를 분수로 나타내기 (3): 공식 ① p. 29 ~ p. 30

1 $9, 1$	2 $42, 99, \frac{14}{33}, 2$
3 $621, 999, \frac{23}{37}, 3$	4 $123, 999, \frac{41}{333}, 3$
5 $2, 9, \frac{23}{9}, 1$	6 $2, 99, \frac{211}{99}, 2$
7 $\frac{1}{3}$	8 $\frac{1}{99}$
9 $\frac{56}{99}$	10 $\frac{43}{333}$
11 $\frac{77}{9}$	12 $\frac{5}{3}$
13 $\frac{34}{9}$	14 $\frac{346}{99}$
15 $\frac{47}{33}$	16 $\frac{201}{37}$

- 7 $0.\dot{3}=\frac{3}{9}=\frac{1}{3}$
- 10 $0.\dot{i}2\dot{9}=\frac{129}{999}=\frac{43}{333}$
- 11 $8.\dot{5}=\frac{85-8}{9}=\frac{77}{9}$
- 12 $1.\dot{6}=\frac{16-1}{9}=\frac{15}{9}=\frac{5}{3}$

$$13 \quad 3.\dot{7} = \frac{37-3}{9} = \frac{34}{9}$$

$$14 \quad 3.\dot{4}\dot{9} = \frac{349-3}{99} = \frac{346}{99}$$

$$15 \quad 1.\dot{4}\dot{2} = \frac{142-1}{99} = \frac{141}{99} = \frac{47}{33}$$

$$16 \quad 5.\dot{4}3\dot{2} = \frac{5432-5}{999} = \frac{5427}{999} = \frac{201}{37}$$

13 순환소수를 분수로 나타내기 (4): 공식 ② p. 31 ~ p. 32

- | | |
|--|-----------------------------------|
| 1 $2, 90, \frac{7}{30}, 1, 1$ | 2 $21, 90, \frac{13}{6}, 1, 1$ |
| 3 $26, 900, \frac{119}{450}, 1, 2$ | 4 $10, 900, \frac{97}{900}, 1, 2$ |
| 5 $432, 4, 990, \frac{214}{495}, 2, 1$ | 6 $12, 990, \frac{68}{55}, 2, 1$ |
| 7 $\frac{7}{90}$ | 8 $\frac{23}{90}$ |
| 9 $\frac{62}{45}$ | 10 $\frac{49}{15}$ |
| 11 $\frac{371}{450}$ | 12 $\frac{13}{100}$ |
| 13 $\frac{362}{495}$ | 14 $\frac{26}{55}$ |
| 15 $\frac{207}{55}$ | 16 $\frac{1279}{495}$ |

$$8 \quad 0.2\dot{5} = \frac{25-2}{90} = \frac{23}{90}$$

$$9 \quad 1.3\dot{7} = \frac{137-13}{90} = \frac{124}{90} = \frac{62}{45}$$

$$10 \quad 3.2\dot{6} = \frac{326-32}{90} = \frac{294}{90} = \frac{49}{15}$$

$$11 \quad 0.82\dot{4} = \frac{824-82}{900} = \frac{742}{900} = \frac{371}{450}$$

$$12 \quad 0.12\dot{9} = \frac{129-12}{900} = \frac{117}{900} = \frac{13}{100}$$

$$13 \quad 0.7\dot{3}\dot{1} = \frac{731-7}{990} = \frac{724}{990} = \frac{362}{495}$$

$$14 \quad 0.4\dot{7}\dot{2} = \frac{472-4}{990} = \frac{468}{990} = \frac{26}{55}$$

$$15 \quad 3.7\dot{6}\dot{3} = \frac{3763-37}{990} = \frac{3726}{990} = \frac{207}{55}$$

$$16 \quad 2.5\dot{8}\dot{3} = \frac{2583-25}{990} = \frac{2558}{990} = \frac{1279}{495}$$

14 순환소수를 분수로 나타내기 (5): 종합 p. 33

- | |
|---------------------------------|
| 1 (1) × (2) ○ (3) ○ (4) × (5) × |
| 2 (1) ○ (2) × (3) ○ (4) × (5) ○ |
| 3 (1) ○ (2) × (3) × (4) ○ (5) ○ |
| 4 (1) × (2) ○ (3) ○ (4) × (5) ○ |

- (1) 순환마디는 2이다.
(4) 분수로 나타내면 $\frac{132-13}{90}$ 이다.
(5) 무한소수이다.
- (2) 분수로 나타낼 때 가장 편리한 식은 $1000x-100x$ 이다.
(4) 순환마디는 3이다.
- (2) 분수로 나타낼 때 가장 편리한 식은 $1000x-10x$ 이다.
(3) 분수로 나타내면 $\frac{263-2}{990} = \frac{261}{990} = \frac{29}{110}$ 이다.
- (1) 무한소수이다.
(4) 분수로 나타내면 $\frac{34}{99}$ 이다.

STEP 2

기본연산 집중연습 | 10~14

p. 34 ~ p. 35

- | | |
|-------------------------------|------------------------------------|
| 1 $100, 99, \frac{16}{99}$ | 2 $1000, 129, 129, \frac{43}{333}$ |
| 3 $10, 90, 90, \frac{11}{30}$ | 4 $10, 990, 990, \frac{47}{330}$ |
| 5 $72, \frac{8}{11}$ | 6 $23, 213, \frac{71}{30}$ |
| 7 $1763, 1746, \frac{97}{55}$ | 8 $4, \frac{43}{9}$ |
| 9 $205, 185, \frac{37}{180}$ | 10 $1, 999, \frac{1345}{999}$ |
| 11 × | 12 × |
| 13 ○ | 14 ○ |
| 15 ○ | 16 ○ |
| 17 ○ | 18 × |
| 19 × | 20 ○ |
| 21 ○ | 22 × |

$$11 \quad 7.\dot{3} = \frac{73-7}{9} = \frac{66}{9} = \frac{22}{3}$$

$$12 \quad 0.2\dot{6} = \frac{26-2}{90} = \frac{24}{90} = \frac{4}{15}$$

$$13 \quad 2.9\dot{1} = \frac{291-29}{90} = \frac{262}{90} = \frac{131}{45}$$

$$14 \quad 1.\dot{3}\dot{6} = \frac{136-1}{99} = \frac{135}{99} = \frac{15}{11}$$

$$15 \quad 0.1\dot{8} = \frac{18-1}{90} = \frac{17}{90}$$

$$16 \quad 0.1\dot{2}\dot{5} = \frac{125-1}{990} = \frac{124}{990} = \frac{62}{495}$$

$$17 \quad 3.\dot{5}4\dot{5} = \frac{3545-3}{999} = \frac{3542}{999}$$

$$18 \quad 1.3\dot{5}\dot{8} = \frac{1358-13}{990} = \frac{1345}{990} = \frac{269}{198}$$

$$19 \quad 0.21\dot{5} = \frac{215-21}{900} = \frac{194}{900} = \frac{97}{450}$$

$$20 \quad 0.\dot{2}0\dot{4} = \frac{204}{999} = \frac{68}{333}$$

$$21 \quad 4.7\dot{3}\dot{6} = \frac{4736-47}{990} = \frac{4689}{990} = \frac{521}{110}$$

$$22 \quad 0.\dot{0}\dot{5} = \frac{5}{99}$$

4 순환소수 $0.\dot{7}1428\dot{5}$ 의 순환마디의 숫자의 개수는 7, 1, 4, 2, 8, 5의 6개이므로 $2018 = 6 \times 336 + 2$
따라서 소수점 아래 2018번째 자리의 숫자는 순환마디가 336번 반복되고 순환마디의 2번째 숫자인 1이다.

$$5 \quad (1) \frac{7}{5} = \frac{7 \times 2}{5 \times 2} = \frac{14}{10} = 1.4$$

$$(2) \frac{7}{25} = \frac{7 \times 2^2}{5^2 \times 2^2} = \frac{28}{100} = 0.28$$

$$(3) \frac{13}{20} = \frac{13 \times 5}{2^2 \times 5 \times 5} = \frac{65}{100} = 0.65$$

$$(4) \frac{3}{40} = \frac{3 \times 5^2}{2^3 \times 5 \times 5^2} = \frac{75}{1000} = 0.075$$

$$6 \quad (1) \frac{6}{45} = \frac{2}{15} = \frac{2}{3 \times 5}$$

$$(2) \frac{9}{60} = \frac{3}{20} = \frac{3}{2^2 \times 5} \Rightarrow \text{유한소수}$$

$$(3) \frac{10}{144} = \frac{5}{72} = \frac{5}{2^3 \times 3^2}$$

$$(4) \frac{6}{56} = \frac{3}{28} = \frac{3}{2^2 \times 7}$$

$$(5) \frac{27}{120} = \frac{9}{40} = \frac{9}{2^3 \times 5} \Rightarrow \text{유한소수}$$

$$8 \quad (2) 1.\dot{7} = \frac{17-1}{9} = \frac{16}{9}$$

$$(3) 9.\dot{3}\dot{9} = \frac{939-9}{99} = \frac{930}{99} = \frac{310}{33}$$

$$(4) 0.0\dot{4} = \frac{4}{90} = \frac{2}{45}$$

$$(5) 1.2\dot{1} = \frac{121-12}{90} = \frac{109}{90}$$

$$(6) 0.15\dot{3} = \frac{153-15}{900} = \frac{138}{900} = \frac{23}{150}$$

$$(7) 0.1\dot{0}\dot{7} = \frac{107-1}{990} = \frac{106}{990} = \frac{53}{495}$$

$$(8) 2.1\dot{5}\dot{6} = \frac{2156-21}{990} = \frac{2135}{990} = \frac{427}{198}$$

9 (2) 순환마디는 05이다.

(5) $0.2\dot{0}\dot{5}$ 로 나타낼 수 있다.

STEP 3

기본연산 테스트

p. 36 ~ p. 37

1 (1) $\frac{6}{2}$ (2) $-1, 0, \frac{6}{2}$

(3) $-3.2, \frac{3}{5}$ (4) $-3.2, -1, 0, \frac{3}{5}, \frac{6}{2}$

2 (1) $0.1666\cdots$, 무한소수 (2) 0.4 , 유한소수

(3) $0.444\cdots$, 무한소수 (4) $0.41666\cdots$, 무한소수

(5) 0.16 , 유한소수

3 (1) $3, 0.27\dot{3}$ (2) $34, 0.0\dot{3}\dot{4}$ (3) $80, 1.\dot{8}\dot{0}$

(4) $026, 3.\dot{0}2\dot{6}$ (5) $324, 2.5\dot{3}2\dot{4}$

4 1

5 (1) 1.4 (2) 0.28 (3) 0.65 (4) 0.075

6 (1) $\times$ (2) $\bigcirc$ (3) $\times$ (4) $\times$ (5) $\bigcirc$

7 (1) $100, 99, 99, \frac{4}{33}$ (2) $1000, 128, 128, \frac{64}{495}$

8 (1) $\frac{68}{99}$ (2) $\frac{16}{9}$ (3) $\frac{310}{33}$ (4) $\frac{2}{45}$

(5) $\frac{109}{90}$ (6) $\frac{23}{150}$ (7) $\frac{53}{495}$ (8) $\frac{427}{198}$

9 (1) $\bigcirc$ (2) $\times$ (3) $\bigcirc$ (4) $\bigcirc$ (5) $\times$

2 식의 계산

STEP 1

01 거듭제곱

p. 40

1 3	2 7^4
3 $3^3 \times 5^2$	4 $5^3 \times 7^2$
5 x^3	6 x^6
7 a^2	8 a^4
9 2, 3	10 $x^5 y^2$
11 $a^3 b^5$	12 $x^4 y^4$

02 지수법칙 (1) : 지수의 합

p. 41 ~ p. 42

1 2, 4, 6	2 a^8
3 3^{10}	4 7^{11}
5 x^{10}	6 b^6
7 a^{23}	8 a^9
9 x^{12}	10 x^{14}
11 b^{16}	12 y^{12}
13 2, 3, 4, 9	14 2^7
15 a^9	16 b^8
17 x^{18}	18 a^{10}
19 y^{10}	20 x^{13}
21 1, 1, 3, 3	22 $a^{10} b^5$
23 $x^8 y^3$	24 $x^3 y^5$
25 $x^6 y^8$	26 $a^5 b^6$
27 $x^8 y^7$	28 $a^9 b^8$

$$22 \quad a^8 \times a^2 \times b^2 \times b^3 = a^{8+2} \times b^{2+3} = a^{10} b^5$$

$$23 \quad x^6 \times x^2 \times y^2 \times y = x^{6+2} \times y^{2+1} = x^8 y^3$$

$$24 \quad x \times x^2 \times y^2 \times y^3 = x^{1+2} \times y^{2+3} = x^3 y^5$$

$$25 \quad x^4 \times y^2 \times x^2 \times y^6 = x^{4+2} \times y^{2+6} = x^6 y^8$$

$$26 \quad a^3 \times b \times a^2 \times b^5 = a^{3+2} \times b^{1+5} = a^5 b^6$$

$$27 \quad x \times x^2 \times x^5 \times y \times y^6 = x^{1+2+5} \times y^{1+6} = x^8 y^7$$

$$28 \quad a^4 \times a^3 \times a^2 \times b \times b^7 = a^{4+3+2} \times b^{1+7} = a^9 b^8$$

03 지수법칙 (2) : 지수의 곱

p. 43 ~ p. 44

1 2, 8	2 x^8
3 3^{14}	4 2^{12}
5 a^{15}	6 a^{20}
7 a^{20}	8 x^9
9 y^{24}	10 x^{28}
11 5^{10}	12 b^{20}
13 2, 8, 9	14 a^{10}
15 x^{14}	16 x^{27}
17 y^{16}	18 x^{16}
19 b^{21}	20 a^{26}
21 x^{34}	22 y^{22}
23 2, 5, 6, 15	24 $a^{10} b^6$
25 $a^{13} b^{20}$	26 $x^3 y^{14}$
27 $a^{13} b^{23}$	28 $a^{20} b^{12}$

$$14 \quad a^4 \times (a^2)^3 = a^4 \times a^{2 \times 3} = a^4 \times a^6 = a^{10}$$

$$15 \quad (x^3)^2 \times (x^2)^4 = x^{3 \times 2} \times x^{2 \times 4} = x^6 \times x^8 = x^{14}$$

$$16 \quad (x^2)^6 \times (x^3)^5 = x^{2 \times 6} \times x^{3 \times 5} = x^{12} \times x^{15} = x^{27}$$

$$17 \quad (y^2)^2 \times (y^4)^3 = y^{2 \times 2} \times y^{4 \times 3} = y^4 \times y^{12} = y^{16}$$

$$18 \quad x \times (x^5)^3 = x \times x^{5 \times 3} = x \times x^{15} = x^{16}$$

$$19 \quad (b^4)^3 \times (b^3)^3 = b^{4 \times 3} \times b^{3 \times 3} = b^{12} \times b^9 = b^{21}$$

$$20 \quad (a^2)^6 \times (a^7)^2 = a^{2 \times 6} \times a^{7 \times 2} = a^{12} \times a^{14} = a^{26}$$

$$21 \quad (x^5)^2 \times (x^6)^4 = x^{5 \times 2} \times x^{6 \times 4} = x^{10} \times x^{24} = x^{34}$$

$$22 \quad (y^3)^4 \times y^{10} = y^{3 \times 4} \times y^{10} = y^{12} \times y^{10} = y^{22}$$

$$24 \quad (a^5)^2 \times (b^2)^3 = a^{5 \times 2} \times b^{2 \times 3} = a^{10} b^6$$

$$\begin{aligned} 25 \quad a^5 \times (a^2)^4 \times (b^4)^5 &= a^5 \times a^{2 \times 4} \times b^{4 \times 5} \\ &= a^5 \times a^8 \times b^{20} \\ &= a^{13} b^{20} \end{aligned}$$

$$\begin{aligned} 26 \quad x^3 \times (y^2)^3 \times (y^4)^2 &= x^3 \times y^{2 \times 3} \times y^{4 \times 2} \\ &= x^3 \times y^6 \times y^8 \\ &= x^3 y^{14} \end{aligned}$$

$$\begin{aligned} 27 \quad a \times (a^3)^4 \times b^2 \times (b^7)^3 &= a \times a^{3 \times 4} \times b^2 \times b^{7 \times 3} \\ &= a \times a^{12} \times b^2 \times b^{21} \\ &= a^{13} b^{23} \end{aligned}$$

$$\begin{aligned} 28 \quad a^{10} \times b^3 \times (a^5)^2 \times (b^3)^3 &= a^{10} \times b^3 \times a^{5 \times 2} \times b^{3 \times 3} \\ &= a^{10} \times a^{10} \times b^3 \times b^9 \\ &= a^{20} b^{12} \end{aligned}$$

04 지수법칙 (3) : 지수의 차

p. 45 ~ p. 46

1	5, 3, 2	2	5^5
3	x^3	4	x^7
5	a^6	6	a^4
7	x^8	8	x
9	1	10	1
11	1	12	1
13	8, 4, 4	14	$\frac{1}{x^9}$
15	$\frac{1}{2^2}$	16	$\frac{1}{x^4}$
17	$\frac{1}{a^5}$	18	$\frac{1}{a^8}$
19	x^8	20	x^4
21	$\frac{1}{x^2}$	22	$\frac{1}{x^{12}}$
23	4, 2, 2, 8, 2, 6	24	x
25	$\frac{1}{x^3}$	26	1

$$\begin{aligned} 19 \quad x^{16} \div (x^2)^4 &= x^{16} \div x^{2 \times 4} \\ &= x^{16} \div x^8 \\ &= x^{16-8} = x^8 \end{aligned}$$

$$\begin{aligned} 20 \quad (x^5)^2 \div (x^3)^2 &= x^{5 \times 2} \div x^{3 \times 2} \\ &= x^{10} \div x^6 \\ &= x^{10-6} = x^4 \end{aligned}$$

$$\begin{aligned} 21 \quad (x^2)^4 \div x^{10} &= x^{2 \times 4} \div x^{10} \\ &= x^8 \div x^{10} \\ &= \frac{1}{x^{10-8}} = \frac{1}{x^2} \end{aligned}$$

$$\begin{aligned} 22 \quad (x^2)^3 \div (x^9)^2 &= x^{2 \times 3} \div x^{9 \times 2} \\ &= x^6 \div x^{18} \\ &= \frac{1}{x^{18-6}} = \frac{1}{x^{12}} \end{aligned}$$

$$\begin{aligned} 24 \quad x^5 \div x \div x^3 &= x^{5-1} \div x^3 \\ &= x^4 \div x^3 \\ &= x^{4-3} = x \end{aligned}$$

$$\begin{aligned} 25 \quad x^8 \div x^2 \div x^9 &= x^{8-2} \div x^9 \\ &= x^6 \div x^9 \\ &= \frac{1}{x^{9-6}} = \frac{1}{x^3} \end{aligned}$$

$$\begin{aligned} 26 \quad a^{10} \div a^3 \div a^7 &= a^{10-3} \div a^7 \\ &= a^7 \div a^7 \\ &= 1 \end{aligned}$$

05 지수법칙을 이용하여 미지수 구하기 (1)

p. 47 ~ p. 49

1	8	2	3
3	4	4	9
5	6	6	11
7	4	8	7
9	3	10	1
11	2	12	7
13	4	14	4
15	2	16	7
17	8	18	5
19	6	20	1
21	9	22	6
23	7	24	3
25	4	26	7
27	5	28	1
29	5	30	7
31	13	32	2
33	6	34	2
35	8	36	6

$$1 \quad x^{\square} \times x^2 = x^{\square+2} = x^{10} \text{에서 } \square+2=10 \quad \therefore \square=8$$

$$2 \quad x \times x^{\square} = x^{1+\square} = x^4 \text{에서 } 1+\square=4 \quad \therefore \square=3$$

$$3 \quad a^{\square} \times a^7 = a^{\square+7} = a^{11} \text{에서 } \square+7=11 \quad \therefore \square=4$$

$$4 \quad a^{\square} \times a = a^{\square+1} = a^{10} \text{에서 } \square+1=10 \quad \therefore \square=9$$

$$5 \quad 2^3 \times 2^{\square} = 2^{3+\square} = 2^9 \text{에서 } 3+\square=9 \quad \therefore \square=6$$

$$6 \quad a^4 \times a^{\square} = a^{4+\square} = a^{15} \text{에서 } 4+\square=15 \quad \therefore \square=11$$

$$\begin{aligned} 7 \quad x^3 \times x^{\square} \times x &= x^{3+\square+1} = x^8 \text{에서} \\ 3+\square+1 &= 8 \quad \therefore \square=4 \end{aligned}$$

$$\begin{aligned} 8 \quad x \times x^2 \times x^{\square} &= x^{1+2+\square} = x^{10} \text{에서} \\ 1+2+\square &= 10 \quad \therefore \square=7 \end{aligned}$$

$$\begin{aligned} 9 \quad a^6 \times a^{\square} \times a^2 &= a^{6+\square+2} = a^{11} \text{에서} \\ 6+\square+2 &= 11 \quad \therefore \square=3 \end{aligned}$$

$$\begin{aligned} 10 \quad a^3 \times a^{\square} \times a^2 &= a^{3+\square+2} = a^6 \text{에서} \\ 3+\square+2 &= 6 \quad \therefore \square=1 \end{aligned}$$

$$11 \quad (x^{\square})^6 = x^{\square \times 6} = x^{12} \text{에서 } \square \times 6 = 12 \quad \therefore \square=2$$

$$12 \quad (a^3)^{\square} = a^{3 \times \square} = a^{21} \text{에서 } 3 \times \square = 21 \quad \therefore \square=7$$

$$13 \quad (x^{\square})^5 = x^{\square \times 5} = x^{20} \text{에서 } \square \times 5 = 20 \quad \therefore \square=4$$

$$14 \quad (3^3)^{\square} = 3^{3 \times \square} = 3^{12} \text{에서 } 3 \times \square = 12 \quad \therefore \square=4$$

$$15 \quad (x^{\square})^3 = x^{\square \times 3} = x^6 \text{에서 } \square \times 3 = 6 \quad \therefore \square=2$$

$$16 \quad (a^4)^{\square} = a^{4 \times \square} = a^{28} \text{에서 } 4 \times \square = 28 \quad \therefore \square=7$$

- 17 $a^{\square} \div a^3 = a^{\square-3} = a^5$ 에서 $\square - 3 = 5 \quad \therefore \square = 8$
- 18 $x^6 \div x^{\square} = x^{6-\square} = x$ 에서 $6 - \square = 1 \quad \therefore \square = 5$
- 19 $a^{\square} \div a = a^{\square-1} = a^5$ 에서 $\square - 1 = 5 \quad \therefore \square = 6$
- 20 $a^4 \div a^{\square} = a^{4-\square} = a^3$ 에서 $4 - \square = 3 \quad \therefore \square = 1$
- 21 $x^{\square} \div x^8 = x^{\square-8} = x$ 에서 $\square - 8 = 1 \quad \therefore \square = 9$
- 22 $x^9 \div x^{\square} = x^{9-\square} = x^3$ 에서 $9 - \square = 3 \quad \therefore \square = 6$
- 23 $2^{\square} \div 2^4 = 2^{\square-4} = 2^3$ 에서 $\square - 4 = 3 \quad \therefore \square = 7$
- 24 $3^5 \div 3^{\square} = 3^{5-\square} = 3^2$ 에서 $5 - \square = 2 \quad \therefore \square = 3$
- 29 $x^3 \div x^{\square} = \frac{1}{x^{\square-3}} = \frac{1}{x^2}$ 에서 $\square - 3 = 2 \quad \therefore \square = 5$
- 30 $x^{\square} \div x^9 = \frac{1}{x^{9-\square}} = \frac{1}{x^2}$ 에서 $9 - \square = 2 \quad \therefore \square = 7$
- 31 $a^{10} \div a^{\square} = \frac{1}{a^{\square-10}} = \frac{1}{a^3}$ 에서 $\square - 10 = 3 \quad \therefore \square = 13$
- 32 $a^{\square} \div a^7 = \frac{1}{a^{7-\square}} = \frac{1}{a^5}$ 에서 $7 - \square = 5 \quad \therefore \square = 2$
- 33 $x^3 \div x^{\square} = \frac{1}{x^{\square-3}} = \frac{1}{x^3}$ 에서 $\square - 3 = 3 \quad \therefore \square = 6$
- 34 $x^{\square} \div x^3 = \frac{1}{x^{3-\square}} = \frac{1}{x}$ 에서 $3 - \square = 1 \quad \therefore \square = 2$
- 35 $5^4 \div 5^{\square} = \frac{1}{5^{\square-4}} = \frac{1}{5^4}$ 에서 $\square - 4 = 4 \quad \therefore \square = 8$
- 36 $2^{\square} \div 2^9 = \frac{1}{2^{9-\square}} = \frac{1}{2^3}$ 에서 $9 - \square = 3 \quad \therefore \square = 6$

STEP 2

기본연산 집중연습 | 01~05

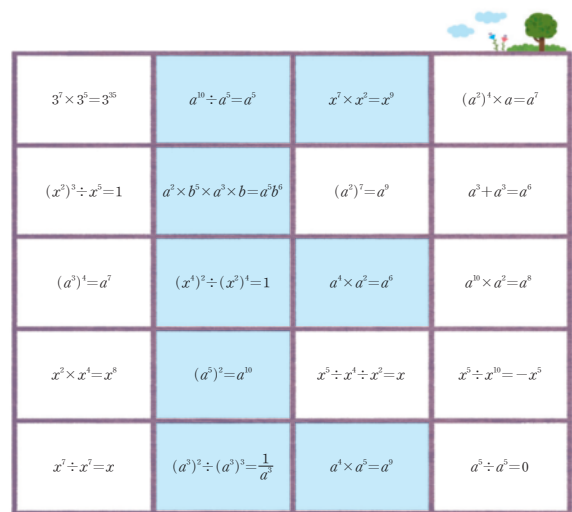
p. 50 ~ p. 51

- | | |
|--------------------|-------------------|
| 1 a^7 | 2 x^8 |
| 3 1 | 4 a |
| 5 x^{15} | 6 b^2 |
| 7 x^{14} | 8 $\frac{1}{x^2}$ |
| 9 1 | 10 $a^5 b^{11}$ |
| 11 x^4 | 12 5^{12} |
| 13 $\frac{1}{a^4}$ | 14 a^8 |
| 15 a^{18} | 16 $\frac{1}{x}$ |
| 17 x^4 | 18 x^{10} |
| 19 (다) | |

- 4 $a^4 \div a^2 \div a = a^{4-2} \div a = a^2 \div a = a^{2-1} = a$
- 6 $b^8 \div (b^3)^2 = b^8 \div b^{3 \times 2} = b^8 \div b^6 = b^{8-6} = b^2$

- 7 $(x^4)^2 \times (x^3)^2 = x^{4 \times 2} \times x^{3 \times 2} = x^8 \times x^6 = x^{8+6} = x^{14}$
- 9 $(a^5)^3 \div (a^3)^5 = a^{5 \times 3} \div a^{3 \times 5} = a^{15} \div a^{15} = 1$
- 10 $a^3 \times a^2 \times b \times b^{10} = a^{3+2} \times b^{1+10} = a^5 b^{11}$
- 13 $(a^4)^3 \div (a^2)^8 = a^{4 \times 3} \div a^{2 \times 8} = a^{12} \div a^{16} = \frac{1}{a^{16-12}} = \frac{1}{a^4}$
- 15 $(a^4)^2 \times (a^2)^5 = a^{4 \times 2} \times a^{2 \times 5} = a^8 \times a^{10} = a^{8+10} = a^{18}$
- 16 $x^9 \div x^7 \div x^3 = x^{9-7} \div x^3 = x^2 \div x^3 = \frac{1}{x^{3-2}} = \frac{1}{x}$
- 18 $(x^2)^2 \times (x^3)^2 = x^{2 \times 2} \times x^{3 \times 2} = x^4 \times x^6 = x^{4+6} = x^{10}$

19



$3^7 \times 3^5 = 3^{35}$	$a^{10} \div a^5 = a^5$	$x^7 \times x^2 = x^9$	$(a^2)^4 \times a = a^7$
$(x^2)^3 \div x^5 = 1$	$a^2 \times b^5 \times a^3 \times b = a^5 b^6$	$(a^2)^7 = a^{14}$	$a^3 + a^3 = a^6$
$(a^3)^4 = a^{12}$	$(x^4)^2 \div (x^2)^4 = 1$	$a^4 \times a^2 = a^6$	$a^{10} \times a^2 = a^{12}$
$x^2 \times x^4 = x^6$	$(a^2)^5 = a^{10}$	$x^5 \div x^1 \div x^2 = x^2$	$x^5 \div x^{10} = -x^5$
$x^7 \div x^7 = x$	$(a^2)^5 \div (a^2)^5 = \frac{1}{a^2}$	$a^4 \times a^5 = a^9$	$a^5 \div a^5 = 0$

STEP 1

06 지수법칙 (4) : 지수의 분배 ①

p. 52 ~ p. 53

- | | |
|---------------------------|--------------------------|
| 1 2, 2, 2, 4, 6 | 2 $a^{12} b^{18}$ |
| 3 $x^3 y^6$ | 4 $x^4 y^4$ |
| 5 $x^{10} y^{15}$ | 6 $a^{28} b^{14}$ |
| 7 $a^6 b^8$ | 8 $a^{12} b^8$ |
| 9 $x^{18} y^6$ | 10 $a^8 b^{10}$ |
| 11 $x^{12} y^{12}$ | 12 $a^{15} b^{20}$ |
| 13 2, 3, 2, 25, 6 | 14 $4a^8$ |
| 15 $27y^{15}$ | 16 $64x^6$ |
| 17 3, 3, 3, 8, 3, 6 | 18 $27a^{15} b^3$ |
| 19 $4x^6 y^6$ | 20 $625x^8 y^4$ |
| 21 $16x^{12} y^{16}$ | 22 $64a^{15} b^6$ |
| 23 $9a^{10} b^8$ | 24 $64a^{12} b^{18}$ |
| 25 $\frac{1}{27} x^6 y^3$ | 26 $\frac{1}{4} a^6 b^8$ |

- 14 $(2a^4)^2 = 2^2 a^{4 \times 2} = 4a^8$
- 15 $(3y^5)^3 = 3^3 y^{5 \times 3} = 27y^{15}$
- 16 $(4x^2)^3 = 4^3 x^{2 \times 3} = 64x^6$
- 18 $(3a^5b)^3 = 3^3 a^{5 \times 3} b^3 = 27a^{15}b^3$
- 19 $(2x^3y^3)^2 = 2^2 x^{3 \times 2} y^{3 \times 2} = 4x^6y^6$
- 20 $(5x^2y)^4 = 5^4 x^{2 \times 4} y^4 = 625x^8y^4$
- 21 $(2x^3y^4)^4 = 2^4 x^{3 \times 4} y^{4 \times 4} = 16x^{12}y^{16}$
- 22 $(4a^5b^2)^3 = 4^3 a^{5 \times 3} b^{2 \times 3} = 64a^{15}b^6$
- 23 $(3a^5b^4)^2 = 3^2 a^{5 \times 2} b^{4 \times 2} = 9a^{10}b^8$
- 24 $(2a^2b^3)^6 = 2^6 a^{2 \times 6} b^{3 \times 6} = 64a^{12}b^{18}$
- 25 $\left(\frac{1}{3}x^2y\right)^3 = \left(\frac{1}{3}\right)^3 x^{2 \times 3} y^3 = \frac{1}{27}x^6y^3$
- 26 $\left(\frac{1}{2}a^3b^4\right)^2 = \left(\frac{1}{2}\right)^2 a^{3 \times 2} b^{4 \times 2} = \frac{1}{4}a^6b^8$

07 지수법칙 (5) : 지수의 분배 ②

p. 54

- | | |
|-------------------------|-----------------------|
| 1 $3, 3, -a^3$ | 2 $-8x^6$ |
| 3 $9a^8$ | 4 x^{16} |
| 5 $5, 5, 5, -x^5y^{25}$ | 6 $4a^6b^4$ |
| 7 $x^{20}y^8$ | 8 $-8x^6y^3$ |
| 9 a^2b^2 | 10 $25x^6y^{10}$ |
| 11 $-64x^6y^9$ | 12 $-243a^{20}b^{20}$ |

- 2 $(-2x^2)^3 = (-2)^3 x^{2 \times 3} = -8x^6$
- 3 $(-3a^4)^2 = (-3)^2 a^{4 \times 2} = 9a^8$
- 4 $(-x^4)^4 = (-1)^4 x^{4 \times 4} = x^{16}$
- 6 $(-2a^3b^2)^2 = (-2)^2 a^{3 \times 2} b^{2 \times 2} = 4a^6b^4$
- 7 $(-x^5y^2)^4 = (-1)^4 x^{5 \times 4} y^{2 \times 4} = x^{20}y^8$
- 8 $(-2x^2y)^3 = (-2)^3 x^{2 \times 3} y^3 = -8x^6y^3$
- 9 $(-ab)^2 = (-1)^2 a^2b^2 = a^2b^2$
- 10 $(-5x^3y^5)^2 = (-5)^2 x^{3 \times 2} y^{5 \times 2} = 25x^6y^{10}$
- 11 $(-4x^2y^3)^3 = (-4)^3 x^{2 \times 3} y^{3 \times 3} = -64x^6y^9$
- 12 $(-3a^4b^5)^5 = (-3)^5 a^{4 \times 5} b^{5 \times 5} = -243a^{20}b^{25}$

08 지수법칙 (6) : 지수의 분배 ③

p. 55 ~ p. 56

- | | |
|------------------------------|-----------------------------|
| 1 $4, 4, 4, 8$ | 2 $\frac{x^6}{y^{15}}$ |
| 3 $\frac{y^4}{x^4}$ | 4 $\frac{b^8}{a^{12}}$ |
| 5 $\frac{y^{12}}{x^6}$ | 6 $\frac{y^6}{x^2}$ |
| 7 $\frac{a^{20}}{b^8}$ | 8 $\frac{y^5}{x^{10}}$ |
| 9 $\frac{y^{30}}{x^{24}}$ | 10 $\frac{b^{20}}{a^{50}}$ |
| 11 $4, 4, 8, 81$ | 12 $\frac{a^6}{4}$ |
| 13 $\frac{27}{a^9}$ | 14 $\frac{8}{x^{12}}$ |
| 15 $5, 5, 5, 32, 15, 25$ | 16 $\frac{z^5}{x^{10}y^5}$ |
| 17 $\frac{b^3}{27a^9}$ | 18 $\frac{25a^2}{b^6}$ |
| 19 $\frac{x^{20}}{32y^{15}}$ | 20 $\frac{x^8}{y^4}$ |
| 21 $-\frac{x^6}{8y^{15}}$ | 22 $-\frac{a^{10}}{b^{15}}$ |
| 23 $-\frac{8x^9}{y^{12}}$ | 24 $\frac{x^{20}}{81y^4}$ |

- 12 $\left(\frac{a^3}{2}\right)^2 = \frac{a^{3 \times 2}}{2^2} = \frac{a^6}{4}$
- 13 $\left(\frac{3}{a^3}\right)^3 = \frac{3^3}{a^{3 \times 3}} = \frac{27}{a^9}$
- 14 $\left(\frac{2}{x^4}\right)^3 = \frac{2^3}{x^{4 \times 3}} = \frac{8}{x^{12}}$
- 16 $\left(\frac{z}{x^2y}\right)^5 = \frac{z^5}{x^{2 \times 5}y^5} = \frac{z^5}{x^{10}y^5}$
- 17 $\left(\frac{b}{3a^3}\right)^3 = \frac{b^3}{3^3a^{3 \times 3}} = \frac{b^3}{27a^9}$
- 18 $\left(\frac{5a}{b^3}\right)^2 = \frac{5^2a^2}{b^{3 \times 2}} = \frac{25a^2}{b^6}$
- 19 $\left(\frac{x^4}{2y^3}\right)^5 = \frac{x^{4 \times 5}}{2^5y^{3 \times 5}} = \frac{x^{20}}{32y^{15}}$
- 20 $\left(-\frac{x^4}{y^2}\right)^2 = (-1)^2 \times \frac{x^{4 \times 2}}{y^{2 \times 2}} = \frac{x^8}{y^4}$
- 21 $\left(-\frac{x^2}{2y^5}\right)^3 = (-1)^3 \times \frac{x^{2 \times 3}}{2^3y^{5 \times 3}} = -\frac{x^6}{8y^{15}}$
- 22 $\left(-\frac{a^2}{b^3}\right)^5 = (-1)^5 \times \frac{a^{2 \times 5}}{b^{3 \times 5}} = -\frac{a^{10}}{b^{15}}$
- 23 $\left(-\frac{2x^3}{y^4}\right)^3 = (-1)^3 \times \frac{2^3x^{3 \times 3}}{y^{4 \times 3}} = -\frac{8x^9}{y^{12}}$
- 24 $\left(-\frac{x^5}{3y}\right)^4 = (-1)^4 \times \frac{x^{5 \times 4}}{3^4y^4} = \frac{x^{20}}{81y^4}$

09 지수법칙을 이용하여 미지수 구하기 (2) p. 57

1	6	2	3
3	2, 12	4	3, 20
5	4, 10	6	4, 18
7	4	8	5
9	3, 2	10	2, 12

- $(x^3 y^\square)^3 = x^{3 \times 3} y^{\square \times 3} = x^9 y^{18}$ 에서
 $\square \times 3 = 18 \quad \therefore \square = 6$
- $(x^\square y^2)^2 = x^{\square \times 2} y^{2 \times 2} = x^6 y^4$ 에서
 $\square \times 2 = 6 \quad \therefore \square = 3$
- $(x^\square y^4)^3 = x^{\square \times 3} y^{4 \times 3} = x^6 y^\square$
 $x^{\square \times 3} = x^6$ 에서 $\square \times 3 = 6 \quad \therefore \square = 2$
 $y^{4 \times 3} = y^\square$ 에서 $\square = 12$
- $(x^5 y^\square)^4 = x^{5 \times 4} y^{\square \times 4} = x^\square y^{12}$
 $y^{\square \times 4} = y^{12}$ 에서 $\square \times 4 = 12 \quad \therefore \square = 3$
 $x^{5 \times 4} = x^\square$ 에서 $\square = 20$
- $(a^2 b^\square)^5 = a^{2 \times 5} b^{\square \times 5} = a^\square b^{20}$
 $b^{\square \times 5} = b^{20}$ 에서 $\square \times 5 = 20 \quad \therefore \square = 4$
 $a^{2 \times 5} = a^\square$ 에서 $\square = 10$
- $(a^\square b^3)^6 = a^{\square \times 6} b^{3 \times 6} = a^{24} b^\square$
 $a^{\square \times 6} = a^{24}$ 에서 $\square \times 6 = 24 \quad \therefore \square = 4$
 $b^{3 \times 6} = b^\square$ 에서 $\square = 18$
- $\left(\frac{x^\square}{y}\right)^4 = \frac{x^{\square \times 4}}{y^4} = \frac{x^{16}}{y^4}$ 에서
 $\square \times 4 = 16 \quad \therefore \square = 4$
- $\left(\frac{a^\square}{b^2}\right)^3 = \frac{a^{\square \times 3}}{b^{2 \times 3}} = \frac{a^{15}}{b^6}$ 에서
 $\square \times 3 = 15 \quad \therefore \square = 5$
- $\left(\frac{a^\square}{b}\right)^2 = \frac{a^{\square \times 2}}{b^2} = \frac{a^6}{b^\square}$
 $a^{\square \times 2} = a^6$ 에서 $\square \times 2 = 6 \quad \therefore \square = 3$
 $b^2 = b^\square$ 에서 $\square = 2$
- $\left(\frac{x^3}{y^\square}\right)^4 = \frac{x^{3 \times 4}}{y^{\square \times 4}} = \frac{x^\square}{y^8}$
 $y^{\square \times 4} = y^8$ 에서 $\square \times 4 = 8 \quad \therefore \square = 2$
 $x^{3 \times 4} = x^\square$ 에서 $\square = 12$

10 지수법칙 (7) : 종합 p. 58 ~ p. 59

1	a^{15}	2	3^{12}
3	x^{13}	4	x^8
5	a^{14}	6	$a^5 b^5$
7	b^6	8	2^{20}
9	x^{21}	10	$x^{12} y^8$
11	$a^{14} b^{12}$	12	$a^{12} b^{15}$
13	a^3	14	1
15	$\frac{1}{x^5}$	16	1
17	x	18	$\frac{1}{a^6}$
19	$x^8 y^4$	20	$8a^6 b^3$
21	$16x^4 y^8$	22	$-x^3 y^{12}$
23	$\frac{4x^2}{y^2}$	24	$\frac{27a^6}{b^9}$
25	$\frac{x^{32}}{y^{16}}$	26	$-\frac{b^9}{27a^3}$

- $a^3 \times a^2 \times b^4 \times b = a^{3+2} \times b^{4+1} = a^5 b^5$
- $(x^3)^4 \times (y^4)^2 = x^{3 \times 4} \times y^{4 \times 2} = x^{12} y^8$
- $(a^3)^4 \times a^2 \times (b^4)^3 = a^{3 \times 4} \times a^2 \times b^{4 \times 3}$
 $= a^{12} \times a^2 \times b^{12}$
 $= a^{14} b^{12}$
- $(a^2)^5 \times b^3 \times (b^6)^2 \times a^2 = a^{2 \times 5} \times b^3 \times b^{6 \times 2} \times a^2$
 $= a^{10} \times b^3 \times b^{12} \times a^2$
 $= a^{12} b^{15}$
- $(a^3)^2 \div (a^2)^3 = a^{3 \times 2} \div a^{2 \times 3} = a^6 \div a^6 = 1$
- $x^7 \div x^5 \div x = x^{7-5} \div x = x^2 \div x = x^{2-1} = x$
- $(a^2)^2 \div a^2 \div a^8 = a^{2 \times 2} \div a^2 \div a^8 = a^4 \div a^2 \div a^8$
 $= a^{4-2} \div a^8 = a^2 \div a^8$
 $= \frac{1}{a^{8-2}} = \frac{1}{a^6}$
- $(2a^2 b)^3 = 2^3 a^{2 \times 3} b^3 = 8a^6 b^3$
- $(-4x^2 y^4)^2 = (-4)^2 x^{2 \times 2} y^{4 \times 2} = 16x^4 y^8$
- $(-xy^4)^3 = (-1)^3 x^3 y^{4 \times 3} = -x^3 y^{12}$
- $\left(\frac{2x}{y}\right)^2 = \frac{2^2 x^2}{y^2} = \frac{4x^2}{y^2}$
- $\left(\frac{3a^2}{b^3}\right)^3 = \frac{3^3 a^{2 \times 3}}{b^{3 \times 3}} = \frac{27a^6}{b^9}$
- $\left(-\frac{x^4}{y^2}\right)^8 = (-1)^8 \times \frac{x^{4 \times 8}}{y^{2 \times 8}} = \frac{x^{32}}{y^{16}}$
- $\left(-\frac{b^3}{3a}\right)^3 = (-1)^3 \times \frac{b^{3 \times 3}}{3^3 a^3} = -\frac{b^9}{27a^3}$

STEP 2

기본연산 집중연습 | 06~10

p. 60 ~ p. 61

- | | |
|---------------------------|----------------------------|
| 1 $x^{14}y^{21}$ | 2 $-8a^6b^9$ |
| 3 $x^{12}y^8$ | 4 $9x^4y^4$ |
| 5 $\frac{y^{15}}{x^9}$ | 6 $\frac{y^6}{x^8}$ |
| 7 $49x^2$ | 8 $x^{10}y^{15}$ |
| 9 $9x^{10}$ | 10 x^6y^3 |
| 11 $16a^8b^{12}$ | 12 $-27x^3y^6$ |
| 13 $\frac{x^3}{y^3}$ | 14 $\frac{a^6}{b^2}$ |
| 15 $-x^3y^6$ | 16 $\frac{9x^6}{y^8}$ |
| 17 $\frac{16a^{12}}{b^8}$ | 18 $-\frac{x^{10}}{32y^5}$ |
| 19 ○ | 20 ○ |
| 21 × | 22 × |
| 23 ○ | 24 × |
| 25 × | 26 ○ |
| 27 × | 28 × |
| 29 ○ | 30 ○ |

- 2 $(-2a^2b^3)^3 = (-2)^3 a^{2 \times 3} b^{3 \times 3} = -8a^6b^9$
- 4 $(3x^2y^2)^2 = 3^2 x^{2 \times 2} y^{2 \times 2} = 9x^4y^4$
- 7 $(-7x)^2 = (-7)^2 x^2 = 49x^2$
- 9 $(-3x^5)^2 = (-3)^2 x^{5 \times 2} = 9x^{10}$
- 11 $(2a^2b^3)^4 = 2^4 a^{2 \times 4} b^{3 \times 4} = 16a^8b^{12}$
- 12 $(-3xy^2)^3 = (-3)^3 x^3 y^{2 \times 3} = -27x^3y^6$
- 15 $(-xy^2)^3 = (-1)^3 x^3 y^{2 \times 3} = -x^3y^6$
- 16 $\left(\frac{-3x^3}{y^4}\right)^2 = \frac{(-3)^2 x^{3 \times 2}}{y^{4 \times 2}} = \frac{9x^6}{y^8}$
- 17 $\left(-\frac{2a^3}{b^2}\right)^4 = (-1)^4 \times \frac{2^4 a^{3 \times 4}}{b^{2 \times 4}} = \frac{16a^{12}}{b^8}$
- 18 $\left(-\frac{x^2}{2y}\right)^5 = (-1)^5 \times \frac{x^{2 \times 5}}{2^5 y^5} = -\frac{x^{10}}{32y^5}$
- 21 $(a^2)^3 = a^{2 \times 3} = a^6$
- 22 $x^3 \div x^6 = \frac{1}{x^{6-3}} = \frac{1}{x^3}$
- 24 $(2a)^3 = 2^3 a^3 = 8a^3$
- 25 $(-x^3y)^3 = (-1)^3 x^{3 \times 3} y^3 = -x^9y^3$
- 27 $\left(\frac{x^5}{y^3}\right)^2 = \frac{x^{5 \times 2}}{y^{3 \times 2}} = \frac{x^{10}}{y^6}$
- 28 $(3xy^2)^3 = 3^3 x^3 y^{2 \times 3} = 27x^3y^6$

STEP 1

11 (단항식) × (단항식)

p. 62 ~ p. 64

- | | |
|------------------------|--------------------------|
| 1 $15xy$ | 2 $14xy$ |
| 3 $4ab$ | 4 $\frac{1}{6}abc$ |
| 5 $6a^2b$ | 6 $\frac{1}{6}ab^2$ |
| 7 $-12ab$ | 8 $6ab$ |
| 9 $-2xy$ | 10 $\frac{1}{2}xy$ |
| 11 $-8ab^2$ | 12 $-a^2b$ |
| 13 $-6a^3$ | 14 $-12x^4$ |
| 15 $2a^5$ | 16 $-6x^7$ |
| 17 $-10x^3y^4$ | 18 $2a^4b^3$ |
| 19 $3x^3y^2$ | 20 $6x^3y^3$ |
| 21 $-12x^2y^3$ | 22 $2a^5b$ |
| 23 $-3x^3y^4$ | 24 $2a^6b^3$ |
| 25 $\frac{7}{2}x^3y^2$ | 26 $24ab^4$ |
| 27 $16x^{10}$ | 28 $-16x^4y$ |
| 29 $-128a^5b^4$ | 30 $5x^6y^7$ |
| 31 $8a^{11}b^7$ | 32 $-\frac{3}{32}x^3y^5$ |
| 33 $\frac{a^9}{b^3}$ | 34 $\frac{y^3}{27x}$ |
| 35 $-32x^8y^{12}$ | 36 $8a^4b$ |

- 26 $-3ab \times (-2b)^3 = -3ab \times (-8b^3) = 24ab^4$
- 27 $(-4x)^2 \times (-x^2)^4 = 16x^2 \times x^8 = 16x^{10}$
- 28 $(-2x)^3 \times 2xy = -8x^3 \times 2xy = -16x^4y$
- 29 $2a^2b \times (-4ab)^3 = 2a^2b \times (-64a^3b^3) = -128a^5b^4$
- 30 $5x^2y \times (x^2y^3)^2 = 5x^2y \times x^4y^6 = 5x^6y^7$
- 31 $(ab^2)^2 \times (2a^3b)^3 = a^2b^4 \times 8a^9b^3 = 8a^{11}b^7$
- 32 $\left(-\frac{3}{8}xy\right)^2 \times \left(-\frac{2}{3}xy^3\right) = \frac{9}{64}x^2y^2 \times \left(-\frac{2}{3}xy^3\right) = -\frac{3}{32}x^3y^5$
- 33 $(a^2b)^3 \times \left(\frac{a}{b^2}\right)^3 = a^6b^3 \times \frac{a^3}{b^6} = \frac{a^9}{b^3}$
- 34 $(-xy^3)^2 \times \left(\frac{1}{3xy}\right)^3 = x^2y^6 \times \frac{1}{27x^3y^3} = \frac{y^3}{27x}$
- 35 $(2xy^2)^3 \times (-4xy^4) \times (-x^2y)^2 = 8x^3y^6 \times (-4xy^4) \times x^4y^2 = -32x^8y^{12}$
- 36 $(-2ab)^3 \times \left(-\frac{a}{b^2}\right)^3 \times \left(\frac{b^2}{a}\right)^2 = -8a^3b^3 \times \left(-\frac{a^3}{b^6}\right) \times \frac{b^4}{a^2} = 8a^4b$

12 역수

p. 65

$$1 \quad -\frac{1}{4a}$$

$$2 \quad \frac{1}{3ab}$$

$$3 \quad \frac{1}{5x}$$

$$4 \quad -\frac{1}{2a^2}$$

$$5 \quad \frac{3}{x}$$

$$6 \quad -\frac{5}{4xy}$$

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

$$8 \quad \frac{10}{9ab^4}$$

$$9 \quad -\frac{y}{18x}$$

$$10 \quad \frac{2}{ab^2}$$

13 (단항식) ÷ (단항식)

p. 66 ~ p. 67

$$1 \quad 8xy, 2y$$

$$2 \quad -\frac{1}{2}a$$

$$3 \quad \frac{3}{4}a^2$$

$$4 \quad -3x^2$$

$$5 \quad 3a^2$$

$$6 \quad -2a^2b$$

$$7 \quad 4a$$

$$8 \quad -\frac{n}{2m}$$

$$9 \quad \frac{24a}{b}$$

$$10 \quad \frac{x}{4y^2}$$

$$11 \quad \frac{4}{x}, 4x$$

$$12 \quad 36a^2$$

$$13 \quad 4a^2$$

$$14 \quad -5a$$

$$15 \quad 6$$

$$16 \quad 28x^3$$

$$17 \quad \frac{5}{3a^2b}, 10ab$$

$$18 \quad -\frac{3a}{2b^2}$$

$$19 \quad 6a$$

$$20 \quad -2xy^2$$

$$21 \quad \frac{20a}{b}$$

$$22 \quad \frac{8}{3}x^2y$$

$$2 \quad -7ab \div 14b = \frac{-7ab}{14b} = -\frac{1}{2}a$$

$$3 \quad 3a^3 \div 4a = \frac{3a^3}{4a} = \frac{3}{4}a^2$$

$$4 \quad -15x^4 \div 5x^2 = \frac{-15x^4}{5x^2} = -3x^2$$

$$5 \quad 6a^3b \div 2ab = \frac{6a^3b}{2ab} = 3a^2$$

$$6 \quad 8a^4b^3 \div (-4a^2b^2) = \frac{8a^4b^3}{-4a^2b^2} = -2a^2b$$

$$7 \quad (-6a)^2 \div 9a = 36a^2 \div 9a = \frac{36a^2}{9a} = 4a$$

$$8 \quad 4m^2n \div (-2m)^3 = 4m^2n \div (-8m^3) \\ = \frac{4m^2n}{-8m^3} = -\frac{n}{2m}$$

$$9 \quad 24a^3b \div (ab)^2 = 24a^3b \div a^2b^2 = \frac{24a^3b}{a^2b^2} = \frac{24a}{b}$$

$$10 \quad x^5y^4 \div (2x^2y^3)^2 = x^5y^4 \div 4x^4y^6 = \frac{x^5y^4}{4x^4y^6} = \frac{x}{4y^2}$$

$$12 \quad 12a^3 \div \frac{a}{3} = 12a^3 \times \frac{3}{a} = 36a^2$$

$$13 \quad 3a^3 \div \frac{3}{4}a = 3a^3 \times \frac{4}{3a} = 4a^2$$

$$14 \quad 6a^2 \div \left(-\frac{6}{5}a\right) = 6a^2 \times \left(-\frac{5}{6a}\right) = -5a$$

$$15 \quad (-3x)^3 \div \left(-\frac{9}{2}x^3\right) = -27x^3 \times \left(-\frac{2}{9x^3}\right) = 6$$

$$16 \quad (-7x^2)^2 \div \frac{7}{4}x = 49x^4 \times \frac{4}{7x} = 28x^3$$

$$18 \quad \frac{5}{6}a^2b \div \left(-\frac{5}{9}ab^3\right) = \frac{5}{6}a^2b \times \left(-\frac{9}{5ab^3}\right) = -\frac{3a}{2b^2}$$

$$19 \quad 2a^2b \div \frac{ab}{3} = 2a^2b \times \frac{3}{ab} = 6a$$

$$20 \quad -x^2y^4 \div \frac{1}{2}xy^2 = -x^2y^4 \times \frac{2}{xy^2} = -2xy^2$$

$$21 \quad 5a^3b \div \left(-\frac{1}{2}ab\right)^2 = 5a^3b \div \frac{1}{4}a^2b^2 \\ = 5a^3b \times \frac{4}{a^2b^2} = \frac{20a}{b}$$

$$22 \quad \left(-\frac{2}{3}xy\right)^2 \div \frac{1}{6}y = \frac{4}{9}x^2y^2 \times \frac{6}{y} = \frac{8}{3}x^2y$$

STEP 2

기본연산 집중연습 | 11~13

p. 68 ~ p. 69

$$1 \quad 10a^2b$$

$$2 \quad -6xy$$

$$3 \quad 12x^2y^3$$

$$4 \quad -25x^4y^5$$

$$5 \quad 4x^9y^8$$

$$6 \quad -128a^{13}b^7$$

$$7 \quad -12a^3b^2$$

$$8 \quad -\frac{1}{2}a^3b^3$$

$$9 \quad 2a^2$$

$$10 \quad \frac{2y}{x}$$

$$11 \quad 8x^2$$

$$12 \quad 3a^2b$$

$$13 \quad -\frac{8}{15}x^2$$

$$14 \quad 4x$$

$$15 \quad \frac{4a^8}{b}$$

$$16 \quad -a^5b$$

$$17 \quad 6ab^4, -10x^3y^4$$

$$18 \quad -7a^5b^3, 8x^7y^{12}$$

$$19 \quad 9x^2y^2, y^2$$

$$20 \quad -\frac{2b}{a^2}, x^6y^7$$

$$21 \quad -\frac{2x^4}{y}, \frac{5}{6y}$$

$$22 \quad \frac{3}{8}x, -2x^{10}y^3$$

$$4 \quad -x^2y \times (5xy^2)^2 = -x^2y \times 25x^2y^4 = -25x^4y^5$$

$$5 \quad (xy^2)^3 \times (2x^3y)^2 = x^3y^6 \times 4x^6y^2 = 4x^9y^8$$

$$\begin{aligned}
6 \quad & (-2a^3b)^3 \times (-4a^2b^2)^2 = -8a^9b^3 \times 16a^4b^4 \\
& = -128a^{13}b^7 \\
7 \quad & 3a \times (-2b)^2 \times (-a^2) = 3a \times 4b^2 \times (-a^2) \\
& = -12a^3b^2 \\
8 \quad & \left(-\frac{3}{2}a\right)^2 \times (-8ab) \times \left(\frac{1}{6}b\right)^2 \\
& = \frac{9}{4}a^2 \times (-8ab) \times \frac{1}{36}b^2 = -\frac{1}{2}a^3b^3 \\
9 \quad & 8a^3 \div 4a = \frac{8a^3}{4a} = 2a^2 \\
10 \quad & 16xy^2 \div 8x^2y = \frac{16xy^2}{8x^2y} = \frac{2y}{x} \\
11 \quad & (4x^2)^2 \div 2x^2 = 16x^4 \div 2x^2 = \frac{16x^4}{2x^2} = 8x^2 \\
12 \quad & (3a^2b)^3 \div (-3a^2b)^2 = 27a^6b^3 \div 9a^4b^2 = \frac{27a^6b^3}{9a^4b^2} = 3a^2b \\
13 \quad & \frac{2}{5}x^3 \div \left(-\frac{3}{4}x\right) = \frac{2}{5}x^3 \times \left(-\frac{4}{3x}\right) = -\frac{8}{15}x^2 \\
14 \quad & 14xy^2 \div \frac{7}{2}y^2 = 14xy^2 \times \frac{2}{7y^2} = 4x \\
15 \quad & (a^3b)^2 \div \frac{b^3}{4a^2} = a^6b^2 \times \frac{4a^2}{b^3} = \frac{4a^8}{b} \\
16 \quad & (-ab)^3 \div \left(\frac{b}{a}\right)^2 = -a^3b^3 \div \frac{b^2}{a^2} = -a^3b^3 \times \frac{a^2}{b^2} = -a^5b \\
18 \quad & (x^2y^3)^2 \times (2xy^2)^3 = x^4y^6 \times 8x^3y^6 = 8x^7y^{12} \\
19 \quad & (-9x)^2 \times \left(-\frac{1}{3}y\right)^2 = 81x^2 \times \frac{1}{9}y^2 = 9x^2y^2 \\
& \left(\frac{x}{y^2}\right)^2 \times \left(\frac{y^3}{x}\right)^2 = \frac{x^2}{y^4} \times \frac{y^6}{x^2} = y^2 \\
20 \quad & -2ab^2 \div a^3b = \frac{-2ab^2}{a^3b} = -\frac{2b}{a^2} \\
& (x^4y^5)^2 \div x^2y^3 = x^8y^{10} \div x^2y^3 = \frac{x^8y^{10}}{x^2y^3} = x^6y^7 \\
21 \quad & (-2x^2y)^3 \div (2xy^2)^2 = -8x^6y^3 \div 4x^2y^4 \\
& = \frac{-8x^6y^3}{4x^2y^4} = -\frac{2x^4}{y} \\
& \frac{2}{3}xy \div \frac{4}{5}xy^2 = \frac{2}{3}xy \times \frac{5}{4xy^2} = \frac{5}{6y} \\
22 \quad & \frac{1}{6}x^3y^2 \div \left(-\frac{2}{3}xy\right)^2 = \frac{1}{6}x^3y^2 \div \frac{4}{9}x^2y^2 \\
& = \frac{1}{6}x^3y^2 \times \frac{9}{4x^2y^2} = \frac{3}{8}x \\
& (4x^2y^3)^2 \div \left(-\frac{2y}{x^2}\right)^3 = 16x^4y^6 \div \left(-\frac{8y^3}{x^6}\right) \\
& = 16x^4y^6 \times \left(-\frac{x^6}{8y^3}\right) = -2x^{10}y^3
\end{aligned}$$

STEP 1

14 단항식의 곱셈과 나눗셈의 혼합 계산(1) p. 70 ~ p. 71

$$\begin{aligned}
1 \quad & \frac{1}{4x^2}, 15x^5 & 2 \quad -\frac{3}{2}x^6 \\
3 \quad & -9x^3y & 4 \quad 4a^3b^3 \\
5 \quad & -10y^2 & 6 \quad 4x^4y^4 \\
7 \quad & -12ab^2 & 8 \quad -2x^2y \\
9 \quad & -3y & 10 \quad \frac{y}{x} \\
11 \quad & \frac{2}{x}, 48x^2y^3 & 12 \quad 72x^2 \\
13 \quad & 36 & 14 \quad \frac{3}{2b^4} \\
15 \quad & -\frac{12x^4}{y} & 16 \quad \frac{9x}{y} \\
17 \quad & \frac{1}{3y^2}, \frac{3}{2x}, \frac{x^2}{y} & 18 \quad -2a \\
19 \quad & -\frac{4}{3}ab & 20 \quad -\frac{2}{x} \\
21 \quad & -4 & 22 \quad \frac{4y}{3x^2}
\end{aligned}$$

$$\begin{aligned}
2 \quad & 3x^2y \div (-4xy^3) \times 2x^5y^2 = 3x^2y \times \left(-\frac{1}{4xy^3}\right) \times 2x^5y^2 \\
& = -\frac{3}{2}x^6 \\
3 \quad & 12xy^2 \times 3x^2y^2 \div (-4y^3) = 12xy^2 \times 3x^2y^2 \times \left(-\frac{1}{4y^3}\right) \\
& = -9x^3y \\
4 \quad & a^4b^3 \times 8b \div 2ab = a^4b^3 \times 8b \times \frac{1}{2ab} = 4a^3b^3 \\
5 \quad & 5x^2y \div (-2x^3y) \times 4xy^2 = 5x^2y \times \left(-\frac{1}{2x^3y}\right) \times 4xy^2 \\
& = -10y^2 \\
6 \quad & 8x^2y \times (-x^3y^3) \div (-2x) \\
& = 8x^2y \times (-x^3y^3) \times \left(-\frac{1}{2x}\right) = 4x^4y^4 \\
7 \quad & 9a^2b \div (-3a) \times 4b \\
& = 9a^2b \times \left(-\frac{1}{3a}\right) \times 4b = -12ab^2 \\
8 \quad & 6x^2 \times xy^2 \div (-3xy) = 6x^2 \times xy^2 \times \left(-\frac{1}{3xy}\right) \\
& = -2x^2y \\
9 \quad & 4x^2 \div (-8x^3) \times 6xy = 4x^2 \times \left(-\frac{1}{8x^3}\right) \times 6xy \\
& = -3y \\
10 \quad & 3xy \times 2y \div 6x^2y = 3xy \times 2y \times \frac{1}{6x^2y} = \frac{y}{x} \\
12 \quad & 4x^2y \div \frac{1}{3}xy^2 \times 6xy = 4x^2y \times \frac{3}{xy^2} \times 6xy = 72x^2
\end{aligned}$$

$$\begin{aligned}
13 \quad & -6x^2 \div \frac{x^3}{3} \times (-2x) = -6x^2 \times \frac{3}{x^3} \times (-2x) = 36 \\
14 \quad & -2ab^3 \times \frac{a^2}{b^4} \div \left(-\frac{4}{3}a^3b^3\right) = -2ab^3 \times \frac{a^2}{b^4} \times \left(-\frac{3}{4a^3b^3}\right) \\
& = \frac{3}{2b^4} \\
15 \quad & 4x^2y^3 \div \frac{2}{3}xy^5 \times (-2x^3y) = 4x^2y^3 \times \frac{3}{2xy^5} \times (-2x^3y) \\
& = -\frac{12x^4}{y} \\
16 \quad & -3x^2 \times \left(-\frac{3}{2}xy\right) \div \frac{1}{2}x^2y^2 \\
& = -3x^2 \times \left(-\frac{3}{2}xy\right) \times \frac{2}{x^2y^2} = \frac{9x}{y} \\
18 \quad & 40a^2b^2 \div (-5ab) \div 4b = 40a^2b^2 \times \left(-\frac{1}{5ab}\right) \times \frac{1}{4b} \\
& = -2a \\
19 \quad & 8a^2b^3 \div (-6ab) \div b = 8a^2b^3 \times \left(-\frac{1}{6ab}\right) \times \frac{1}{b} \\
& = -\frac{4}{3}ab \\
20 \quad & 16x^2y \div (-2xy) \div 4x^2 = 16x^2y \times \left(-\frac{1}{2xy}\right) \times \frac{1}{4x^2} \\
& = -\frac{2}{x} \\
21 \quad & 8x^3 \div \frac{1}{2}x^2 \div (-4x) = 8x^3 \times \frac{2}{x^2} \times \left(-\frac{1}{4x}\right) = -4 \\
22 \quad & 2xy^2 \div \left(-\frac{1}{2}xy\right) \div (-3x^2) \\
& = 2xy^2 \times \left(-\frac{2}{xy}\right) \times \left(-\frac{1}{3x^2}\right) = \frac{4y}{3x^2}
\end{aligned}$$

15 단항식의 곱셈과 나눗셈의 혼합 계산 (2) p. 72 ~ p. 73

1 $-8x^3, \frac{1}{6x^2}, -4x^2$	2 $-3x^6y$
3 $32x^2y^3$	4 $-\frac{4a^2}{b}$
5 $2x^2y^2$	6 $4x^4y^4$
7 $5x^7y^4$	8 $8x^4y$
9 $-6xy^4$	10 x^6y^6
11 $\frac{5}{xy^2}, 4y^2, 20x^2y^4$	12 $-16x^6y^4$
13 $6a^2b^2$	14 $-\frac{1}{24}a^3b$
15 $12ab$	16 $-\frac{1}{3}x^5$
17 $-x^2y^{11}$	18 $-3a^3b^7$
19 $-\frac{4}{9}x^4$	20 $-18x^2y$
21 20	22 $-\frac{a}{12b}$

$$\begin{aligned}
2 \quad & 6x^3 \div (-2xy) \times (x^2y)^2 = 6x^3 \times \left(-\frac{1}{2xy}\right) \times x^4y^2 \\
& = -3x^6y \\
3 \quad & 18x^3 \times (-4y^2)^2 \div 9xy = 18x^3 \times 16y^4 \times \frac{1}{9xy} = 32x^2y^3 \\
4 \quad & (-4a)^2 \div 8ab \times (-2a) = 16a^2 \times \frac{1}{8ab} \times (-2a) \\
& = -\frac{4a^2}{b} \\
5 \quad & 4x^2y \times (-2y)^2 \div 8y = 4x^2y \times 4y^2 \times \frac{1}{8y} = 2x^2y^2 \\
6 \quad & 8x^2y \times (-xy)^3 \div (-2x) \\
& = 8x^2y \times (-x^3y^3) \times \left(-\frac{1}{2x}\right) = 4x^4y^4 \\
7 \quad & (-5xy)^2 \times (x^2y)^3 \div 5xy = 25x^2y^2 \times x^6y^3 \times \frac{1}{5xy} \\
& = 5x^7y^4 \\
8 \quad & (-6x^3y^2)^2 \div 18x^4y^5 \times (-2xy)^2 \\
& = 36x^6y^4 \times \frac{1}{18x^4y^5} \times 4x^2y^2 = 8x^4y \\
9 \quad & (-4xy^3)^2 \times 3x^2y \div (-2xy)^3 \\
& = 16x^2y^6 \times 3x^2y \div (-8x^3y^3) \\
& = 16x^2y^6 \times 3x^2y \times \left(-\frac{1}{8x^3y^3}\right) = -6xy^4 \\
10 \quad & (4xy^3)^2 \div (-2x^2y^3)^4 \times (-x^3y^3)^4 \\
& = 16x^2y^6 \div 16x^8y^{12} \times x^{12}y^{12} \\
& = 16x^2y^6 \times \frac{1}{16x^8y^{12}} \times x^{12}y^{12} = x^6y^6 \\
12 \quad & (2x^2y)^3 \times (-3xy^2) \div \frac{3}{2}xy \\
& = 8x^6y^3 \times (-3xy^2) \times \frac{2}{3xy} = -16x^6y^4 \\
13 \quad & (-2ab^3)^3 \div \left(-\frac{4}{3}a^3b^3\right) \times \frac{a^2}{b^4} \\
& = -8a^3b^9 \times \left(-\frac{3}{4a^3b^3}\right) \times \frac{a^2}{b^4} = 6a^2b^2 \\
14 \quad & \left(-\frac{2}{3}ab\right)^2 \div (-4b) \times \frac{3}{8}a = \frac{4}{9}a^2b^2 \times \left(-\frac{1}{4b}\right) \times \frac{3}{8}a \\
& = -\frac{1}{24}a^3b \\
15 \quad & a^2b \times (-2ab)^2 \div \frac{1}{3}a^3b^2 = a^2b \times 4a^2b^2 \times \frac{3}{a^3b^2} = 12ab \\
16 \quad & (-3x^2y)^2 \div 9y^3 \times \left(-\frac{1}{3}xy\right) \\
& = 9x^4y^2 \times \frac{1}{9y^3} \times \left(-\frac{1}{3}xy\right) = -\frac{1}{3}x^5 \\
17 \quad & -x^2y^3 \div \left(\frac{x}{y^2}\right)^3 \times x^3y^2 = -x^2y^3 \div \frac{x^3}{y^6} \times x^3y^2 \\
& = -x^2y^3 \times \frac{y^6}{x^3} \times x^3y^2 = -x^2y^{11}
\end{aligned}$$

$$\begin{aligned}
18 \quad & 16a^5b^2 \div \left(-\frac{2a}{b}\right)^3 \times \frac{3}{2}ab^2 \\
& = 16a^5b^2 \div \left(-\frac{8a^3}{b^3}\right) \times \frac{3}{2}ab^2 \\
& = 16a^5b^2 \times \left(-\frac{b^3}{8a^3}\right) \times \frac{3}{2}ab^2 = -3a^3b^7 \\
19 \quad & 24xy^2 \div (-4y)^2 \times \left(-\frac{2}{3}x\right)^3 \\
& = 24xy^2 \div 16y^2 \times \left(-\frac{8}{27}x^3\right) \\
& = 24xy^2 \times \frac{1}{16y^2} \times \left(-\frac{8}{27}x^3\right) = -\frac{4}{9}x^4 \\
20 \quad & (-4xy^3)^2 \times \frac{1}{3}x^3y \div \left(-\frac{2}{3}xy^2\right)^3 \\
& = 16x^2y^6 \times \frac{1}{3}x^3y \div \left(-\frac{8}{27}x^3y^6\right) \\
& = 16x^2y^6 \times \frac{1}{3}x^3y \times \left(-\frac{27}{8x^3y^6}\right) = -18x^2y \\
21 \quad & (-2xy)^3 \div x^2y^3 \div \left(-\frac{2}{5}x\right) \\
& = (-8x^3y^3) \times \frac{1}{x^2y^3} \times \left(-\frac{5}{2x}\right) = 20 \\
22 \quad & \left(-\frac{2}{3}a\right)^3 \div 8b^3 \div \left(-\frac{2a}{3b}\right)^2 = -\frac{8}{27}a^3 \div 8b^3 \div \frac{4a^2}{9b^2} \\
& = -\frac{8}{27}a^3 \times \frac{1}{8b^3} \times \frac{9b^2}{4a^2} \\
& = -\frac{a}{12b}
\end{aligned}$$

16 □ 안에 알맞은 단항식 구하기 p. 74 ~ p. 75

1 $-5xy^2$	2 $2a$
3 $-7a^4b^6$	4 $-2x^2y^2$
5 $4xy$	6 $2xy$
7 $-3x^2y^2$	8 $\frac{2}{3xy}$
9 $-2ab$	10 $6a^3b^2$
11 $-3y$	12 $\frac{1}{2}a$
13 $2ab^3$	14 $3y^3$
15 $-x^2y^3$	16 $\frac{3}{4}y^3$
17 $\frac{1}{2}xy^5$	18 $-\frac{3b^3}{a}$

$$\begin{aligned}
2 \quad & 2a^3b \times \square = 4a^4b \text{에서 } \square = \frac{4a^4b}{2a^3b} = 2a \\
3 \quad & 3a^2b^3 \times \square = -21a^6b^9 \text{에서 } \square = \frac{-21a^6b^9}{3a^2b^3} = -7a^4b^6 \\
4 \quad & -4x^2y \times \square = 8x^4y^3 \text{에서 } \square = \frac{8x^4y^3}{-4x^2y} = -2x^2y^2 \\
6 \quad & 6x^2y \div \square = 3x \text{에서 } 6x^2y \times \frac{1}{\square} = 3x \\
& \therefore \square = \frac{6x^2y}{3x} = 2xy
\end{aligned}$$

$$\begin{aligned}
7 \quad & -48x^2y^3 \div \square = 16y \text{에서 } -48x^2y^3 \times \frac{1}{\square} = 16y \\
& \therefore \square = \frac{-48x^2y^3}{16y} = -3x^2y^2 \\
8 \quad & 2xy^2 \div \square = 3x^2y^3 \text{에서 } 2xy^2 \times \frac{1}{\square} = 3x^2y^3 \\
& \therefore \square = \frac{2xy^2}{3x^2y^3} = \frac{2}{3xy} \\
10 \quad & 3ab^3 \times 4a^2b \div \square = 2b^2 \text{에서 } 3ab^3 \times 4a^2b \times \frac{1}{\square} = 2b^2 \\
& 12a^3b^4 \times \frac{1}{\square} = 2b^2 \quad \therefore \square = \frac{12a^3b^4}{2b^2} = 6a^3b^2 \\
11 \quad & 4x^3y \times \square \div (-x^2y) = 12xy \text{에서} \\
& 4x^3y \times \square \times \left(-\frac{1}{x^2y}\right) = 12xy \\
& \square \times (-4x) = 12xy \quad \therefore \square = \frac{12xy}{-4x} = -3y \\
12 \quad & (-64a^2b^4) \times \square \div 8ab^3 = -4a^2b \text{에서} \\
& (-64a^2b^4) \times \square \times \frac{1}{8ab^3} = -4a^2b \\
& \square \times (-8ab) = -4a^2b \quad \therefore \square = \frac{-4a^2b}{-8ab} = \frac{1}{2}a \\
13 \quad & a^2b^2 \times \square \div 2ab^2 = a^2b^3 \text{에서 } a^2b^2 \times \square \times \frac{1}{2ab^2} = a^2b^3 \\
& \square \times \frac{a}{2} = a^2b^3 \quad \therefore \square = a^2b^3 \times \frac{2}{a} = 2ab^3 \\
14 \quad & x^4y \div 3x^2y^2 \times \square = x^2y^2 \text{에서 } x^4y \times \frac{1}{3x^2y^2} \times \square = x^2y^2 \\
& \frac{x^2}{3y} \times \square = x^2y^2 \quad \therefore \square = x^2y^2 \times \frac{3y}{x^2} = 3y^3 \\
15 \quad & 3x^2y \div \square \times (-2xy)^3 = 24x^3y \text{에서} \\
& 3x^2y \times \frac{1}{\square} \times (-8x^3y^3) = 24x^3y \\
& \frac{1}{\square} \times (-24x^5y^4) = 24x^3y \\
& \therefore \square = \frac{-24x^5y^4}{24x^3y} = -x^2y^3 \\
16 \quad & \square \times (-2x)^2 \div 3x^2y^3 = 1 \text{에서 } \square \times 4x^2 \times \frac{1}{3x^2y^3} = 1 \\
& \square \times \frac{4}{3y^3} = 1 \quad \therefore \square = \frac{3}{4}y^3 \\
17 \quad & \square \times (-4x^4y^2)^2 \div 2xy = 4x^8y^8 \text{에서} \\
& \square \times 16x^8y^4 \times \frac{1}{2xy} = 4x^8y^8 \\
& \square \times 8x^7y^3 = 4x^8y^8 \quad \therefore \square = \frac{4x^8y^8}{8x^7y^3} = \frac{1}{2}xy^5 \\
18 \quad & (-3a^3)^2 \div \square \times \left(\frac{b^2}{a}\right)^4 = -3a^3b^5 \text{에서} \\
& 9a^6 \times \frac{1}{\square} \times \frac{b^8}{a^4} = -3a^3b^5 \\
& \frac{1}{\square} \times 9a^2b^8 = -3a^3b^5 \quad \therefore \square = \frac{9a^2b^8}{-3a^3b^5} = -\frac{3b^3}{a}
\end{aligned}$$

STEP 2

기본연산 집중연습 | 14~16

p. 76 ~ p. 77

- | | |
|-------------------|-----------------------|
| 1 $-32x$ | 2 $6a^2b$ |
| 3 $10x^6y^4$ | 4 b^2 |
| 5 $-\frac{x}{6y}$ | 6 $-\frac{4}{3}ab$ |
| 7 $-2x^5y$ | 8 $12a^3b$ |
| 9 $-12xy^5$ | 10 $9x^2y^3$ |
| 11 $9x^7y^5$ | 12 $\frac{4a^4}{b^2}$ |
| 13 $-6xy^4$ | 14 a^5b^2 |
| 15 $8x^{12}y$ | 16 $18x^4y^2$ |
| 17 상현 | |

- $16x^2 \div (-2xy) \times 4y = 16x^2 \times \left(-\frac{1}{2xy}\right) \times 4y = -32x$
- $4a^2b \div 2ab^2 \times 3ab^2 = 4a^2b \times \frac{1}{2ab^2} \times 3ab^2 = 6a^2b$
- $15x^5y^4 \div 3xy \times 2x^2y = 15x^5y^4 \times \frac{1}{3xy} \times 2x^2y = 10x^6y^4$
- $4a^2 \times 2a^3b \div \frac{8a^5}{b} = 4a^2 \times 2a^3b \times \frac{b}{8a^5} = b^2$
- $4x^2y^4 \times \frac{2}{3}x^3 \div (-16x^4y^5)$
 $= 4x^2y^4 \times \frac{2}{3}x^3 \times \left(-\frac{1}{16x^4y^5}\right) = -\frac{x}{6y}$
- $-2ab^2 \times (2ab)^2 \div 6a^2b^3 = -2ab^2 \times 4a^2b^2 \times \frac{1}{6a^2b^3}$
 $= -\frac{4}{3}ab$
- $8x^6y^3 \times (-xy^2) \div (-2xy^2)^2$
 $= 8x^6y^3 \times (-xy^2) \div 4x^2y^4$
 $= 8x^6y^3 \times (-xy^2) \times \frac{1}{4x^2y^4} = -2x^5y$
- $12a^3b^2 \div 4a^2b^3 \times (2ab)^2 = 12a^3b^2 \times \frac{1}{4a^2b^3} \times 4a^2b^2$
 $= 12a^3b$
- $4x^2y \times (-3xy^3)^2 \div (-3x^3y^2)$
 $= 4x^2y \times 9x^2y^6 \times \left(-\frac{1}{3x^3y^2}\right) = -12xy^5$
- $(-6x^3y)^2 \div 4x^5y \times xy^2 = 36x^6y^2 \times \frac{1}{4x^5y} \times xy^2$
 $= 9x^2y^3$
- $(-2xy^3)^2 \times 27x^6y^3 \div 12xy^4$
 $= 4x^2y^6 \times 27x^6y^3 \times \frac{1}{12xy^4} = 9x^7y^5$

$$\begin{aligned} 12 \quad & (-3a^3)^2 \times 16b^4 \div (6ab^3)^2 = 9a^6 \times 16b^4 \div 36a^2b^6 \\ & = 9a^6 \times 16b^4 \times \frac{1}{36a^2b^6} \\ & = \frac{4a^4}{b^2} \end{aligned}$$

$$\begin{aligned} 13 \quad & (-4xy^3)^2 \times 3x^2y \div (-2xy)^3 \\ & = 16x^2y^6 \times 3x^2y \div (-8x^3y^3) \\ & = 16x^2y^6 \times 3x^2y \times \left(-\frac{1}{8x^3y^3}\right) = -6xy^4 \end{aligned}$$

$$\begin{aligned} 14 \quad & 2a^4b \div \frac{1}{2}ab \times \left(-\frac{1}{2}ab\right)^2 = 2a^4b \times \frac{2}{ab} \times \frac{1}{4}a^2b^2 \\ & = a^5b^2 \end{aligned}$$

$$\begin{aligned} 15 \quad & \left(-\frac{2}{3}x\right)^3 \div \frac{y^2}{x^9} \times (-3y)^3 = -\frac{8}{27}x^3 \times \frac{x^9}{y^2} \times (-27y^3) \\ & = 8x^{12}y \end{aligned}$$

$$\begin{aligned} 16 \quad & (-2xy^3)^3 \div (-4x^3y) \times \left(\frac{3x^2}{y^3}\right)^2 \\ & = -8x^3y^9 \times \left(-\frac{1}{4x^3y}\right) \times \frac{9x^4}{y^6} = 18x^4y^2 \end{aligned}$$

- 17 지유 $\Rightarrow -5a \times 2a \times b^2 \div (-b) = 10a^2b$
 상현 $\Rightarrow ab^2 \times a \div b^2 \div a = a$
 은주 $\Rightarrow a \times 3a \times b \times b = 3a^2b^2$
 성준 $\Rightarrow a^2 \times ab \div b^2 \div ab = \frac{a^2}{b^2}$
 소정 $\Rightarrow b^2 \div (-a) \div b \times (-3ab) = 3b^2$
 따라서 상현이가 매점에 가게 된다.

STEP 1

17 다항식의 덧셈

p. 78 ~ p. 79

- | | |
|---------------------|---------------|
| 1 $8, 3$ | 2 $7x+7y$ |
| 3 $5a+b$ | 4 $7a+4b$ |
| 5 $3a-b$ | 6 $6x+5y$ |
| 7 $-3a+5b$ | 8 $-x-10y$ |
| 9 $9a-5b+1$ | 10 $-2x-3y+7$ |
| 11 $-3, 12, 2x-15y$ | 12 $12a+2b$ |
| 13 $-x+3y$ | 14 $9x+2y$ |
| 15 $3x+y$ | 16 $-7x+7y$ |
| 17 $-x+4y$ | 18 $-23x-5y$ |
| 19 $11x+13y$ | 20 $-4a-9b$ |
| 21 $6a+b$ | 22 $-2x-2y$ |

$$\begin{aligned}
12 \quad & 3(2a+4b)+2(3a-5b)=6a+12b+6a-10b \\
& =12a+2b \\
13 \quad & 7(-x-y)+2(3x+5y)=-7x-7y+6x+10y \\
& =-x+3y \\
14 \quad & -6(x-2y)+5(3x-2y)=-6x+12y+15x-10y \\
& =9x+2y \\
15 \quad & 5(x-y)+2(-x+3y)=5x-5y-2x+6y \\
& =3x+y \\
16 \quad & -2(3x+2y)+(-x+11y)=-6x-4y-x+11y \\
& =-7x+7y \\
17 \quad & 2(x-y)+3(-x+2y)=2x-2y-3x+6y \\
& =-x+4y \\
18 \quad & 4(-2x+y)+3(-5x-3y)=-8x+4y-15x-9y \\
& =-23x-5y \\
19 \quad & -3(x-5y)+2(7x-y)=-3x+15y+14x-2y \\
& =11x+13y \\
20 \quad & 2(-a-3b)+\frac{1}{3}(-6a-9b)=-2a-6b-2a-3b \\
& =-4a-9b \\
21 \quad & \frac{1}{2}(4a-2b)+\frac{2}{3}(6a+3b)=2a-b+4a+2b \\
& =6a+b \\
22 \quad & -\frac{3}{4}(2x+4y)+\frac{1}{2}(-x+2y) \\
& =-\frac{3}{2}x-3y-\frac{1}{2}x+y=-2x-2y
\end{aligned}$$

18 다항식의 뺄셈

p. 80 ~ p. 81

1 2, 3	2 3x+6y
3 7a+b	4 x-y
5 -3x+9y	6 a-2b
7 2x+8y	8 -2x-y
9 5a+7b-7	10 2x-3y+4
11 2, 4, -5x+10y	12 -7x-5y
13 17x-14y	14 -a+12b
15 7x-11y	16 4x+11y
17 -2a-3b	18 5x-y
19 -x-y+2	20 a+9b-4
21 2x-7y-8	22 7x-y

$$\begin{aligned}
2 \quad & (5x+2y)-(2x-4y)=5x+2y-2x+4y \\
& =3x+6y \\
3 \quad & (14a-9b)-(7a-10b)=14a-9b-7a+10b \\
& =7a+b \\
4 \quad & (4x-5y)-(3x-4y)=4x-5y-3x+4y=x-y \\
5 \quad & (x+7y)-(4x-2y)=x+7y-4x+2y \\
& =-3x+9y \\
6 \quad & (3a+4b)-(2a+6b)=3a+4b-2a-6b=a-2b \\
7 \quad & (3x+2y)-(x-6y)=3x+2y-x+6y=2x+8y \\
8 \quad & (-3x+y)-(-x+2y)=-3x+y+x-2y \\
& =-2x-y \\
9 \quad & (6a+4b-2)-(a-3b+5) \\
& =6a+4b-2-a+3b-5=5a+7b-7 \\
10 \quad & (-2x-y-1)-(-4x+2y-5) \\
& =-2x-y-1+4x-2y+5=2x-3y+4 \\
12 \quad & (-4x+7y)-3(x+4y)=-4x+7y-3x-12y \\
& =-7x-5y \\
13 \quad & 4(3x-y)-5(-x+2y)=12x-4y+5x-10y \\
& =17x-14y \\
14 \quad & 2(a+3b)-3(a-2b)=2a+6b-3a+6b \\
& =-a+12b \\
15 \quad & 5(x-y)-2(-x+3y)=5x-5y+2x-6y \\
& =7x-11y \\
16 \quad & (2x-3y)-2(-x-7y)=2x-3y+2x+14y \\
& =4x+11y \\
17 \quad & \frac{1}{2}(4a-2b)-\frac{2}{3}(6a+3b)=2a-b-4a-2b \\
& =-2a-3b \\
18 \quad & \frac{1}{3}(6x-9y)-\frac{1}{4}(-12x-8y)=2x-3y+3x+2y \\
& =5x-y \\
19 \quad & (3x-5y+6)-4(x-y+1) \\
& =3x-5y+6-4x+4y-4=-x-y+2 \\
20 \quad & 3(a+2b-3)-(2a-3b-5) \\
& =3a+6b-9-2a+3b+5=a+9b-4 \\
21 \quad & 3(2x+y-2)-2(2x+5y+1) \\
& =6x+3y-6-4x-10y-2=2x-7y-8 \\
22 \quad & 2(4x-3y+1)-(x-5y+2) \\
& =8x-6y+2-x+5y-2=7x-y
\end{aligned}$$

19 계수가 분수인 다항식의 계산

p. 82 ~ p. 83

$$1 \quad 3, 9, 15, \frac{19x+y}{6}$$

$$2 \quad \frac{5x+y}{4}$$

$$3 \quad \frac{14x-22y}{15}$$

$$4 \quad \frac{7x-y}{4}$$

$$5 \quad \frac{7}{12}x - \frac{1}{6}y$$

$$6 \quad \frac{13}{5}x - \frac{9}{10}y$$

$$7 \quad \frac{17x-y}{6}$$

$$8 \quad \frac{11x-7y}{12}$$

$$9 \quad 3, 3, 3, \frac{x+11y}{12}$$

$$10 \quad \frac{x-y}{6}$$

$$11 \quad \frac{-7x-11y}{12}$$

$$12 \quad \frac{1}{12}x + \frac{4}{3}y$$

$$13 \quad \frac{-2x+4y}{15}$$

$$14 \quad \frac{-5x-3y}{4}$$

$$15 \quad \frac{1}{2}x + \frac{4}{3}y$$

$$16 \quad \frac{-x+7y}{12}$$

$$17 \quad \frac{x+17y}{12}$$

$$18 \quad \frac{11x-2y}{15}$$

$$2 \quad \frac{2x-y}{2} + \frac{x+3y}{4} = \frac{2(2x-y) + x+3y}{4} \\ = \frac{4x-2y+x+3y}{4} = \frac{5x+y}{4}$$

$$3 \quad \frac{x-2y}{3} + \frac{3x-4y}{5} = \frac{5(x-2y) + 3(3x-4y)}{15} \\ = \frac{5x-10y+9x-12y}{15} \\ = \frac{14x-22y}{15}$$

$$4 \quad \frac{5x+3y}{4} + \frac{x-2y}{2} = \frac{5x+3y+2(x-2y)}{4} \\ = \frac{5x+3y+2x-4y}{4} = \frac{7x-y}{4}$$

$$5 \quad \frac{x+y}{3} + \frac{x-2y}{4} = \frac{4(x+y) + 3(x-2y)}{12} \\ = \frac{4x+4y+3x-6y}{12} \\ = \frac{7x-2y}{12} = \frac{7}{12}x - \frac{1}{6}y$$

$$6 \quad \frac{4x-y}{2} + \frac{3x-2y}{5} = \frac{5(4x-y) + 2(3x-2y)}{10} \\ = \frac{20x-5y+6x-4y}{10} \\ = \frac{26x-9y}{10} = \frac{13}{5}x - \frac{9}{10}y$$

$$7 \quad \frac{3x-5y}{2} + \frac{4x+7y}{3} = \frac{3(3x-5y) + 2(4x+7y)}{6} \\ = \frac{9x-15y+8x+14y}{6} \\ = \frac{17x-y}{6}$$

$$8 \quad \frac{x-y}{4} + \frac{2x-y}{3} = \frac{3(x-y) + 4(2x-y)}{12} \\ = \frac{3x-3y+8x-4y}{12} = \frac{11x-7y}{12}$$

$$10 \quad \frac{x+y}{2} - \frac{x+2y}{3} = \frac{3(x+y) - 2(x+2y)}{6} \\ = \frac{3x+3y-2x-4y}{6} \\ = \frac{x-y}{6}$$

$$11 \quad \frac{-x+3y}{4} - \frac{x+5y}{3} = \frac{3(-x+3y) - 4(x+5y)}{12} \\ = \frac{-3x+9y-4x-20y}{12} \\ = \frac{-7x-11y}{12}$$

$$12 \quad \frac{x+2y}{4} - \frac{x-5y}{6} = \frac{3(x+2y) - 2(x-5y)}{12} \\ = \frac{3x+6y-2x+10y}{12} \\ = \frac{x+16y}{12} = \frac{1}{12}x + \frac{4}{3}y$$

$$13 \quad \frac{x-2y}{5} - \frac{x-2y}{3} = \frac{3(x-2y) - 5(x-2y)}{15} \\ = \frac{3x-6y-5x+10y}{15} \\ = \frac{-2x+4y}{15}$$

$$14 \quad \frac{x-y}{4} - \frac{3x+y}{2} = \frac{x-y-2(3x+y)}{4} \\ = \frac{x-y-6x-2y}{4} \\ = \frac{-5x-3y}{4}$$

$$15 \quad \frac{3x-2y}{3} - \frac{x-4y}{2} = \frac{2(3x-2y) - 3(x-4y)}{6} \\ = \frac{6x-4y-3x+12y}{6} \\ = \frac{3x+8y}{6} = \frac{1}{2}x + \frac{4}{3}y$$

$$16 \quad \frac{2x+y}{3} - \frac{3x-y}{4} = \frac{4(2x+y) - 3(3x-y)}{12} \\ = \frac{8x+4y-9x+3y}{12} \\ = \frac{-x+7y}{12}$$

$$17 \quad \frac{2x+4y}{6} - \frac{x-3y}{4} = \frac{2(2x+4y) - 3(x-3y)}{12} \\ = \frac{4x+8y-3x+9y}{12} \\ = \frac{x+17y}{12}$$

$$18 \quad \frac{4x-y}{3} - \frac{3x-y}{5} = \frac{5(4x-y) - 3(3x-y)}{15} \\ = \frac{20x-5y-9x+3y}{15} \\ = \frac{11x-2y}{15}$$

STEP 2

기본연산 집중연습 | 17~19

p. 84 ~ p. 85

- 1 $7x-4y$
 - 2 $7a-11b+1$
 - 3 $x-18y$
 - 4 $2x+3y$
 - 5 $2x-5y-3$
 - 6 $-6x+11y$
 - 7 $\frac{5}{6}a-\frac{5}{12}b$
 - 8 $\frac{13}{5}x+\frac{1}{10}y$
 - 9 $\frac{19}{15}x-\frac{6}{5}y$
 - 10 $-\frac{1}{6}a+5b$
 - 11 $\frac{-x+5y}{6}$
 - 12 $-\frac{1}{12}x-\frac{1}{6}y$
 - 13 $-x-2y, x+3y$
 - 14 $3x+2y+5, x-4$
 - 15 $-x+2y-5, -2x+3y-11$
 - 16 $-2x-6y, 4x+11y$
 - 17 $-8x+15y-4, -2x+7y-3$
 - 18 $5x-5y+4, -5x+16y-14$
-
- 3 $3(-x-5y)+(4x-3y)=-3x-15y+4x-3y$
 $=x-18y$
 - 4 $(3x+7y)-(x+4y)=3x+7y-x-4y$
 $=2x+3y$
 - 5 $(3x-y-5)-(x+4y-2)=3x-y-5-x-4y+2$
 $=2x-5y-3$
 - 6 $(-3x+5y)-3(x-2y)=-3x+5y-3x+6y$
 $=-6x+11y$
 - 7 $\frac{a+b}{3}+\frac{2a-3b}{4}=\frac{4(a+b)+3(2a-3b)}{12}$
 $=\frac{4a+4b+6a-9b}{12}$
 $=\frac{10a-5b}{12}=\frac{5}{6}a-\frac{5}{12}b$
 - 8 $\frac{4x+y}{2}+\frac{3x-2y}{5}=\frac{5(4x+y)+2(3x-2y)}{10}$
 $=\frac{20x+5y+6x-4y}{10}$
 $=\frac{26x+y}{10}=\frac{13}{5}x+\frac{1}{10}y$
 - 9 $\frac{2x-3y}{3}+\frac{3x-y}{5}=\frac{5(2x-3y)+3(3x-y)}{15}$
 $=\frac{10x-15y+9x-3y}{15}$
 $=\frac{19x-18y}{15}=\frac{19}{15}x-\frac{6}{5}y$
 - 10 $\frac{2a+12b}{3}-\frac{5a-6b}{6}=\frac{2(2a+12b)-(5a-6b)}{6}$
 $=\frac{4a+24b-5a+6b}{6}$
 $=\frac{-a+30b}{6}=-\frac{1}{6}a+5b$

$$11 \quad \frac{3x+y}{2}-\frac{5x-y}{3}=\frac{3(3x+y)-2(5x-y)}{6}$$

$$=\frac{9x+3y-10x+2y}{6}$$

$$=\frac{-x+5y}{6}$$

$$12 \quad \frac{x-4y}{6}-\frac{x-2y}{4}=\frac{2(x-4y)-3(x-2y)}{12}$$

$$=\frac{2x-8y-3x+6y}{12}$$

$$=\frac{-x-2y}{12}=-\frac{1}{12}x-\frac{1}{6}y$$

$$15 \quad (-4x+5y-1)+2(x-y-5)$$

$$=-4x+5y-1+2x-2y-10=-2x+3y-11$$

$$16 \quad (2x-y)-(4x+5y)=2x-y-4x-5y$$

$$=-2x-6y$$

$$(-x+4y)-(-5x-7y)=-x+4y+5x+7y$$

$$=4x+11y$$

$$17 \quad (-2x+8y-3)-(6x-7y+1)$$

$$=-2x+8y-3-6x+7y-1=-8x+15y-4$$

$$(x+3y-2)-(3x-4y+1)$$

$$=x+3y-2-3x+4y-1=-2x+7y-3$$

$$18 \quad (x-4y+3)-(-4x+y-1)$$

$$=x-4y+3+4x-y+1=5x-5y+4$$

$$(-3x+2y-4)-2(x-7y+5)$$

$$=-3x+2y-4-2x+14y-10=-5x+16y-14$$

STEP 1

20 이차식

p. 86

- | | |
|------|------|
| 1 ○ | 2 ○ |
| 3 × | 4 × |
| 5 × | 6 ○ |
| 7 × | 8 × |
| 9 × | 10 ○ |
| 11 ○ | 12 × |

7 분모에 x^2 이 있으므로 x 에 대한 이차식이 아니다.

8 $2x^2+5x-2x^2+3=5x+3$
 따라서 x 에 대한 이차식이 아니다.

9 $3x^2+x-1-(4+3x^2)$
 $=3x^2+x-1-4-3x^2=x-5$
 따라서 x 에 대한 이차식이 아니다.

11 $x^3-(x^3-2x^2+1)=x^3-x^3+2x^2-1=2x^2-1$
 따라서 x 에 대한 이차식이다.

21 이차식의 덧셈과 뺄셈

p. 87

- 1 $-x^2+2x+3$
 - 2 $3x^2-5x+5$
 - 3 x^2+5x-1
 - 4 $5x^2-2$
 - 5 $7x^2-3x-3$
 - 6 $-x^2+6x-4$
 - 7 $3x^2+8$
 - 8 $4x^2-x-2$
 - 9 $-6x^2-5x-8$
 - 10 $7x^2-14x-1$
-
- 1 $(2x^2-3x+5)+(-3x^2+5x-2)$
 $=2x^2-3x+5-3x^2+5x-2=-x^2+2x+3$
 - 2 $(5x^2-3x-2)+(-2x^2-2x+7)$
 $=5x^2-3x-2-2x^2-2x+7=3x^2-5x+5$
 - 3 $(2x^2-7)+(-x^2+5x+6)=2x^2-7-x^2+5x+6$
 $=x^2+5x-1$
 - 4 $2(x^2-2x)+(3x^2+4x-2)=2x^2-4x+3x^2+4x-2$
 $=5x^2-2$
 - 5 $(5x^2+x-7)+2(x^2-2x+2)$
 $=5x^2+x-7+2x^2-4x+4=7x^2-3x-3$
 - 6 $(2x^2+x-3)-(3x^2-5x+1)$
 $=2x^2+x-3-3x^2+5x-1=-x^2+6x-4$
 - 7 $(5x^2-2x+7)-(2x^2-2x-1)$
 $=5x^2-2x+7-2x^2+2x+1=3x^2+8$
 - 8 $(3x^2-4x)-(-x^2-3x+2)=3x^2-4x+x^2+3x-2$
 $=4x^2-x-2$
 - 9 $(x-2x^2)-2(2x^2+3x+4)=x-2x^2-4x^2-6x-8$
 $=-6x^2-5x-8$
 - 10 $4(2x^2-4x+1)-(x^2-2x+5)$
 $=8x^2-16x+4-x^2+2x-5=7x^2-14x-1$

22 여러 가지 괄호가 있는 다항식의 계산 p. 88 ~ p. 89

- 1 $y, -3, 3, 5x+2y$
- 2 $7a-3b-4$
- 3 $x+3y+1$
- 4 $4x+3y$
- 5 $-3x+y$
- 6 $-3x^2+6x+5$
- 7 $x+3$
- 8 $-x^2+4x$
- 9 $2b, a, 2b, b, a, 4a+b$
- 10 $x-2y$
- 11 $12x-2y$
- 12 $6x-4y$
- 13 $6a-4b$
- 14 $5x-4y$
- 15 $2x-y$
- 16 $5x+2y+2$
- 17 $4x^2-6x-1$
- 18 $-2x+5$

- 2 $5a-\{4-(2a-3b)\}=5a-(4-2a+3b)$
 $=5a-4+2a-3b=7a-3b-4$
- 3 $3x+y-\{x-(2y-x+1)\}=3x+y-(x-2y+x-1)$
 $=3x+y-(2x-2y-1)$
 $=3x+y-2x+2y+1$
 $=x+3y+1$
- 4 $5x-\{3x-2y-(2x+y)\}=5x-(3x-2y-2x-y)$
 $=5x-(x-3y)$
 $=5x-x+3y=4x+3y$
- 5 $4x-\{2x-3y-(-5x-2y)\}$
 $=4x-(2x-3y+5x+2y)$
 $=4x-(7x-y)=4x-7x+y=-3x+y$
- 6 $2x^2-\{5x^2+x-(7x+5)\}=2x^2-(5x^2+x-7x-5)$
 $=2x^2-(5x^2-6x-5)$
 $=2x^2-5x^2+6x+5$
 $=-3x^2+6x+5$
- 7 $-2x^2+2-\{3x^2-1-(5x^2+x)\}$
 $=-2x^2+2-(3x^2-1-5x^2-x)$
 $=-2x^2+2-(-2x^2-x-1)$
 $=-2x^2+2+2x^2+x+1=x+3$
- 8 $5x^2-2\{x^2-x-(-2x^2+x)\}$
 $=5x^2-2(x^2-x+2x^2-x)$
 $=5x^2-2(3x^2-2x)=5x^2-6x^2+4x=-x^2+4x$
- 10 $x-[y-\{x-(y+x)\}]=x-\{y-(x-y-x)\}$
 $=x-\{y-(-y)\}$
 $=x-(y+y)=x-2y$
- 11 $4x-[3x-\{6x-(2y-5x)\}]$
 $=4x-\{3x-(6x-2y+5x)\}$
 $=4x-\{3x-(11x-2y)\}$
 $=4x-(3x-11x+2y)$
 $=4x-(-8x+2y)=4x+8x-2y=12x-2y$
- 12 $7x-[2x+5y-\{3x-(2x-y)\}]$
 $=7x-\{2x+5y-(3x-2x+y)\}$
 $=7x-\{2x+5y-(x+y)\}$
 $=7x-(2x+5y-x-y)$
 $=7x-(x+4y)=7x-x-4y=6x-4y$
- 13 $3a-2b-[-2a-\{3a-2(a+b)\}]$
 $=3a-2b-\{-2a-(3a-2a-2b)\}$
 $=3a-2b-\{-2a-(a-2b)\}$
 $=3a-2b-(-2a-a+2b)$
 $=3a-2b-(-3a+2b)$
 $=3a-2b+3a-2b=6a-4b$

$$\begin{aligned}
14 \quad & 2x - [7y - 2x - \{2x - (x - 3y)\}] \\
& = 2x - \{7y - 2x - (2x - x + 3y)\} \\
& = 2x - \{7y - 2x - (x + 3y)\} \\
& = 2x - (7y - 2x - x - 3y) \\
& = 2x - (-3x + 4y) = 2x + 3x - 4y = 5x - 4y
\end{aligned}$$

$$\begin{aligned}
15 \quad & 6x - [2x - \{x - 5y - (3x - 4y)\}] \\
& = 6x - \{2x - (x - 5y - 3x + 4y)\} \\
& = 6x - \{2x - (-2x - y)\} \\
& = 6x - (2x + 2x + y) \\
& = 6x - (4x + y) = 6x - 4x - y = 2x - y
\end{aligned}$$

$$\begin{aligned}
16 \quad & 2x - [3x - \{2y - (5 - 6x) + 7\}] \\
& = 2x - \{3x - (2y - 5 + 6x + 7)\} \\
& = 2x - \{3x - (6x + 2y + 2)\} \\
& = 2x - (3x - 6x - 2y - 2) \\
& = 2x - (-3x - 2y - 2) \\
& = 2x + 3x + 2y + 2 = 5x + 2y + 2
\end{aligned}$$

$$\begin{aligned}
17 \quad & x^2 - [2x - \{3x^2 - (4x - 5)\} + 6] \\
& = x^2 - \{2x - (3x^2 - 4x + 5) + 6\} \\
& = x^2 - (2x - 3x^2 + 4x - 5 + 6) \\
& = x^2 - (-3x^2 + 6x + 1) \\
& = x^2 + 3x^2 - 6x - 1 = 4x^2 - 6x - 1
\end{aligned}$$

$$\begin{aligned}
18 \quad & 3x^2 - [x^2 + 6x - \{4x - (2x^2 - 5)\}] \\
& = 3x^2 - \{x^2 + 6x - (4x - 2x^2 + 5)\} \\
& = 3x^2 - (x^2 + 6x - 4x + 2x^2 - 5) \\
& = 3x^2 - (3x^2 + 2x - 5) \\
& = 3x^2 - 3x^2 - 2x + 5 = -2x + 5
\end{aligned}$$

STEP 2

기본연산 집중연습 | 20~22

p. 90 ~ p. 91

- | | |
|----------------------|----------------------|
| 1 ○ | 2 × |
| 3 × | 4 ○ |
| 5 ○ | 6 × |
| 7 × | 8 ○ |
| 9 $4x^2 - x + 1$ | 10 $9a^2 - 3a + 1$ |
| 11 $-3x^2 + 8x - 13$ | 12 $7a^2 - 3a - 3$ |
| 13 $-3x^2 + 7x - 2$ | 14 $3x^2 + 2x - 1$ |
| 15 $2a^2 + 3a + 5$ | 16 $2x^2 + 4x + 7$ |
| 17 $5x - 2y$ | 18 $4x - 6y$ |
| 19 $8x - 4y$ | 20 $-3x + 2y$ |
| 21 $-3x^2 - 5x + 4$ | 22 $-4x^2 - 3x + 3$ |
| 23 $4x^2 - 7x + 4$ | 24 $-2x^2 + 4x - 10$ |

$$\begin{aligned}
7 \quad & 3x^2 + 2x - 1 - (x + 3x^2) = 3x^2 + 2x - 1 - x - 3x^2 \\
& = x - 1
\end{aligned}$$

따라서 x 에 대한 이차식이 아니다.

$$\begin{aligned}
8 \quad & x^3 - (x^3 - 5x^2 + 3) = x^3 - x^3 + 5x^2 - 3 = 5x^2 - 3 \\
& \text{따라서 } x \text{에 대한 이차식이다.}
\end{aligned}$$

$$\begin{aligned}
9 \quad & (x^2 - 6x + 2) + (3x^2 + 5x - 1) \\
& = x^2 - 6x + 2 + 3x^2 + 5x - 1 = 4x^2 - x + 1
\end{aligned}$$

$$\begin{aligned}
10 \quad & (7a^2 - 4a + 5) + (2a^2 + a - 4) \\
& = 7a^2 - 4a + 5 + 2a^2 + a - 4 = 9a^2 - 3a + 1
\end{aligned}$$

$$\begin{aligned}
11 \quad & 3(-3x^2 + 5x - 4) + (6x^2 - 7x - 1) \\
& = -9x^2 + 15x - 12 + 6x^2 - 7x - 1 \\
& = -3x^2 + 8x - 13
\end{aligned}$$

$$\begin{aligned}
12 \quad & (5a^2 + a - 7) + 2(a^2 - 2a + 2) \\
& = 5a^2 + a - 7 + 2a^2 - 4a + 4 = 7a^2 - 3a - 3
\end{aligned}$$

$$\begin{aligned}
13 \quad & (-x^2 + 6x + 5) - (2x^2 - x + 7) \\
& = -x^2 + 6x + 5 - 2x^2 + x - 7 = -3x^2 + 7x - 2
\end{aligned}$$

$$\begin{aligned}
14 \quad & (4x^2 - 3x + 1) - (x^2 - 5x + 2) \\
& = 4x^2 - 3x + 1 - x^2 + 5x - 2 = 3x^2 + 2x - 1
\end{aligned}$$

$$\begin{aligned}
15 \quad & 3(2a^2 + 3a - 1) - (4a^2 + 6a - 8) \\
& = 6a^2 + 9a - 3 - 4a^2 - 6a + 8 = 2a^2 + 3a + 5
\end{aligned}$$

$$\begin{aligned}
16 \quad & (5x^2 - 2x + 4) - 3(x^2 - 2x - 1) \\
& = 5x^2 - 2x + 4 - 3x^2 + 6x + 3 = 2x^2 + 4x + 7
\end{aligned}$$

$$\begin{aligned}
17 \quad & 4x - \{3y - (-2x + y) - 3x\} \\
& = 4x - (3y + 2x - y - 3x) \\
& = 4x - (-x + 2y) \\
& = 4x + x - 2y = 5x - 2y
\end{aligned}$$

$$\begin{aligned}
18 \quad & 3x - 4y - \{x - 3y - (2x - 5y)\} \\
& = 3x - 4y - (x - 3y - 2x + 5y) \\
& = 3x - 4y - (-x + 2y) \\
& = 3x - 4y + x - 2y = 4x - 6y
\end{aligned}$$

$$\begin{aligned}
19 \quad & 5x - [3y - \{x - (-2x + y)\}] \\
& = 5x - \{3y - (x + 2x - y)\} \\
& = 5x - \{3y - (3x - y)\} \\
& = 5x - (3y - 3x + y) \\
& = 5x - (-3x + 4y) = 5x + 3x - 4y = 8x - 4y
\end{aligned}$$

$$\begin{aligned}
20 \quad & x - [3x - \{2x - y + 3(-x + y)\}] \\
& = x - \{3x - (2x - y - 3x + 3y)\} \\
& = x - \{3x - (-x + 2y)\} \\
& = x - (3x + x - 2y) \\
& = x - (4x - 2y) = x - 4x + 2y = -3x + 2y
\end{aligned}$$

$$\begin{aligned} 21 \quad 2x+3-\{3x^2-(1-7x)\} &= 2x+3-(3x^2-1+7x) \\ &= 2x+3-3x^2+1-7x \\ &= -3x^2-5x+4 \end{aligned}$$

$$\begin{aligned} 22 \quad 3x-\{7x^2+4x-(3x^2-2x+3)\} \\ &= 3x-(7x^2+4x-3x^2+2x-3) \\ &= 3x-(4x^2+6x-3) \\ &= 3x-4x^2-6x+3 = -4x^2-3x+3 \end{aligned}$$

$$\begin{aligned} 23 \quad x^2-3x-[1-\{3x^2-(4x-5)\}] \\ &= x^2-3x-\{1-(3x^2-4x+5)\} \\ &= x^2-3x-(1-3x^2+4x-5) \\ &= x^2-3x-(-3x^2+4x-4) \\ &= x^2-3x+3x^2-4x+4 \\ &= 4x^2-7x+4 \end{aligned}$$

$$\begin{aligned} 24 \quad 4x^2-[2x-2\{x^2+3x-(5+4x^2)\}] \\ &= 4x^2-\{2x-2(x^2+3x-5-4x^2)\} \\ &= 4x^2-\{2x-2(-3x^2+3x-5)\} \\ &= 4x^2-(2x+6x^2-6x+10) \\ &= 4x^2-(6x^2-4x+10) \\ &= 4x^2-6x^2+4x-10 = -2x^2+4x-10 \end{aligned}$$

STEP 1

23 (단항식) × (다항식)

p. 92 ~ p. 93

1 $6x^2, 2xy$	2 $-5x^2+10xy$
3 $5a^2-2ab$	4 $-10x^2-6xy$
5 x^2y+xy^2	6 $-6a^2b-8ab^2$
7 $6a^2-2ab+2a$	8 $-2x^2-6xy+4x$
9 $-8x^2y-12xy+8x$	10 $-3a^2b+6ab^2-3ab$
11 $4x^2, 3xy$	12 $-2a^2-3ab$
13 $3x^2-21xy$	14 $-9x^2+6xy$
15 $-x^2+3xy$	16 $6x^2-4xy$
17 $-6x^2-4xy$	18 $3ab^2+5b^2$
19 $2x^2+6xy-10x$	20 $ab-3b^2+5b$
21 $-4a^2+20ab+12a$	22 $-4a^2+6ab+8a$

$$\begin{aligned} 2 \quad -5x(x-2y) &= -5x \times x - (-5x) \times 2y \\ &= -5x^2+10xy \end{aligned}$$

$$3 \quad \frac{1}{4}a(20a-8b) = \frac{1}{4}a \times 20a - \frac{1}{4}a \times 8b = 5a^2-2ab$$

$$\begin{aligned} 4 \quad -\frac{2}{3}x(15x+9y) &= -\frac{2}{3}x \times 15x + \left(-\frac{2}{3}x\right) \times 9y \\ &= -10x^2-6xy \end{aligned}$$

$$5 \quad xy(x+y) = xy \times x + xy \times y = x^2y+xy^2$$

$$\begin{aligned} 6 \quad -2ab(3a+4b) &= -2ab \times 3a + (-2ab) \times 4b \\ &= -6a^2b-8ab^2 \end{aligned}$$

$$\begin{aligned} 7 \quad 2a(3a-b+1) &= 2a \times 3a - 2a \times b + 2a \times 1 \\ &= 6a^2-2ab+2a \end{aligned}$$

$$\begin{aligned} 8 \quad -2x(x+3y-2) \\ &= -2x \times x + (-2x) \times 3y - (-2x) \times 2 \\ &= -2x^2-6xy+4x \end{aligned}$$

$$\begin{aligned} 9 \quad -4x(2xy+3y-2) \\ &= -4x \times 2xy + (-4x) \times 3y - (-4x) \times 2 \\ &= -8x^2y-12xy+8x \end{aligned}$$

$$\begin{aligned} 10 \quad 3ab(-a+2b-1) \\ &= 3ab \times (-a) + 3ab \times 2b - 3ab \times 1 \\ &= -3a^2b+6ab^2-3ab \end{aligned}$$

$$\begin{aligned} 12 \quad (2a+3b) \times (-a) &= 2a \times (-a) + 3b \times (-a) \\ &= -2a^2-3ab \end{aligned}$$

$$13 \quad (x-7y) \times 3x = x \times 3x - 7y \times 3x = 3x^2-21xy$$

$$\begin{aligned} 14 \quad (3x-2y) \times (-3x) &= 3x \times (-3x) - 2y \times (-3x) \\ &= -9x^2+6xy \end{aligned}$$

$$\begin{aligned} 15 \quad (2x-6y) \times \left(-\frac{1}{2}x\right) &= 2x \times \left(-\frac{1}{2}x\right) - 6y \times \left(-\frac{1}{2}x\right) \\ &= -x^2+3xy \end{aligned}$$

$$\begin{aligned} 16 \quad (15x-10y) \times \frac{2}{5}x &= 15x \times \frac{2}{5}x - 10y \times \frac{2}{5}x \\ &= 6x^2-4xy \end{aligned}$$

$$\begin{aligned} 17 \quad (9x+6y) \times \left(-\frac{2}{3}x\right) &= 9x \times \left(-\frac{2}{3}x\right) + 6y \times \left(-\frac{2}{3}x\right) \\ &= -6x^2-4xy \end{aligned}$$

$$\begin{aligned} 18 \quad (9ab+15b) \times \frac{1}{3}b &= 9ab \times \frac{1}{3}b + 15b \times \frac{1}{3}b \\ &= 3ab^2+5b^2 \end{aligned}$$

$$\begin{aligned} 19 \quad (x+3y-5) \times 2x &= x \times 2x + 3y \times 2x - 5 \times 2x \\ &= 2x^2+6xy-10x \end{aligned}$$

$$\begin{aligned} 20 \quad (a-3b+5) \times b &= a \times b - 3b \times b + 5 \times b \\ &= ab-3b^2+5b \end{aligned}$$

$$\begin{aligned} 21 \quad (a-5b-3) \times (-4a) \\ &= a \times (-4a) - 5b \times (-4a) - 3 \times (-4a) \\ &= -4a^2+20ab+12a \end{aligned}$$

$$\begin{aligned} 22 \quad (6a-9b-12) \times \left(-\frac{2}{3}a\right) \\ &= 6a \times \left(-\frac{2}{3}a\right) - 9b \times \left(-\frac{2}{3}a\right) - 12 \times \left(-\frac{2}{3}a\right) \\ &= -4a^2+6ab+8a \end{aligned}$$

24 (다항식)÷(단항식)

p. 94 ~ p. 95

$$1 \quad 2x, 8x-6y$$

$$3 \quad -x+2$$

$$5 \quad 2x+4y$$

$$7 \quad -2x+3y$$

$$9 \quad -4a^4b^2-2ab^2$$

$$11 \quad \frac{2}{3x}, \frac{2}{3x}, \frac{2}{3x}, 6x-2y$$

$$13 \quad 15x-3$$

$$15 \quad 3b^2-6a$$

$$17 \quad -\frac{5}{2}a^2+10b$$

$$19 \quad 12ab^2-2ab$$

$$2 \quad 3a+1$$

$$4 \quad -2x+y$$

$$6 \quad -4a+3b$$

$$8 \quad 6x^3y-3x$$

$$10 \quad -5a^2-ab$$

$$12 \quad -4x+16$$

$$14 \quad -3a-\frac{3}{2}b$$

$$16 \quad \frac{4}{3}x+\frac{8}{3}y$$

$$18 \quad 6x^2y-xy$$

$$20 \quad 8ab-12$$

$$2 \quad (15a^2+5a) \div 5a = \frac{15a^2+5a}{5a} = \frac{15a^2}{5a} + \frac{5a}{5a} = 3a+1$$

$$3 \quad (-3x^2+6x) \div 3x = \frac{-3x^2+6x}{3x} = \frac{-3x^2}{3x} + \frac{6x}{3x} = -x+2$$

$$4 \quad (12x^2-6xy) \div (-6x) = \frac{12x^2-6xy}{-6x} = \frac{12x^2}{-6x} - \frac{6xy}{-6x} = -2x+y$$

$$5 \quad (6xy+12y^2) \div 3y = \frac{6xy+12y^2}{3y} = \frac{6xy}{3y} + \frac{12y^2}{3y} = 2x+4y$$

$$6 \quad (8a^2-6ab) \div (-2a) = \frac{8a^2-6ab}{-2a} = \frac{8a^2}{-2a} - \frac{6ab}{-2a} = -4a+3b$$

$$7 \quad (4x^2y-6xy^2) \div (-2xy) = \frac{4x^2y-6xy^2}{-2xy} = \frac{4x^2y}{-2xy} - \frac{6xy^2}{-2xy} = -2x+3y$$

$$8 \quad (18x^4y^2-9x^2y) \div 3xy = \frac{18x^4y^2-9x^2y}{3xy} = \frac{18x^4y^2}{3xy} - \frac{9x^2y}{3xy} = 6x^3y-3x$$

$$9 \quad (16a^5b^3+8a^2b^3) \div (-4ab) = \frac{16a^5b^3+8a^2b^3}{-4ab} = \frac{16a^5b^3}{-4ab} + \frac{8a^2b^3}{-4ab} = -4a^4b^2-2ab^2$$

$$10 \quad (15a^4b+3a^3b^2) \div (-3a^2b) = \frac{15a^4b+3a^3b^2}{-3a^2b} = \frac{15a^4b}{-3a^2b} + \frac{3a^3b^2}{-3a^2b} = -5a^2-ab$$

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

$$13 \quad (10x^2-2x) \div \frac{2}{3}x = (10x^2-2x) \times \frac{3}{2x} = 15x-3$$

$$14 \quad (2a^2+ab) \div \left(-\frac{2}{3}a\right) = (2a^2+ab) \times \left(-\frac{3}{2a}\right) = -3a-\frac{3}{2}b$$

$$15 \quad (ab^3-2a^2b) \div \frac{1}{3}ab = (ab^3-2a^2b) \times \frac{3}{ab} = 3b^2-6a$$

$$16 \quad (x^2y+2xy^2) \div \frac{3}{4}xy = (x^2y+2xy^2) \times \frac{4}{3xy} = \frac{4}{3}x+\frac{8}{3}y$$

$$17 \quad (2a^3b-8ab^2) \div \left(-\frac{4}{5}ab\right) = (2a^3b-8ab^2) \times \left(-\frac{5}{4ab}\right) = -\frac{5}{2}a^2+10b$$

$$18 \quad \left(3x^3y^2-\frac{1}{2}x^2y^2\right) \div \frac{1}{2}xy = \left(3x^3y^2-\frac{1}{2}x^2y^2\right) \times \frac{2}{xy} = 6x^2y-xy$$

$$19 \quad \left(3a^2b^3-\frac{1}{2}a^2b^2\right) \div \frac{1}{4}ab = \left(3a^2b^3-\frac{1}{2}a^2b^2\right) \times \frac{4}{ab} = 12ab^2-2ab$$

$$20 \quad (4a^2b^3-6ab^2) \div \frac{1}{2}ab^2 = (4a^2b^3-6ab^2) \times \frac{2}{ab^2} = 8ab-12$$

25 덧셈, 뺄셈, 곱셈, 나눗셈이 혼합된 식의 계산 p. 96 ~ p. 97

$$1 \quad 2xy, 12x^2, -2x^2+8xy$$

$$3 \quad 2x^2$$

$$5 \quad 3x-4y, 4y, -2x$$

$$7 \quad 2a^2-3b^2-5ab$$

$$9 \quad 2x+7y$$

$$11 \quad -a-4b$$

$$13 \quad \frac{4}{3y}, 8x^2, 12x, -12x$$

$$15 \quad 6x^2y-xy^2$$

$$17 \quad 10a^2-7ab$$

$$2 \quad -x^2+10x$$

$$4 \quad -15x^2+4xy$$

$$6 \quad 2y$$

$$8 \quad -3y+2$$

$$10 \quad -x-5y$$

$$12 \quad 5a^2+5ab+16a$$

$$14 \quad 2y^2$$

$$16 \quad -12x^2-14xy$$

$$18 \quad 8x^2-22xy$$

$$2 \quad 2x(x+4)-x(3x-2) = 2x^2+8x-3x^2+2x = -x^2+10x$$

$$3 \quad \frac{1}{3}x(12x-6y)+(x-y) \times (-2x) = 4x^2-2xy-2x^2+2xy = 2x^2$$

$$\begin{aligned}
4 \quad & \left(x + \frac{2}{3}y\right) \times (-3x) + 6x(y-2x) \\
& = -3x^2 - 2xy + 6xy - 12x^2 = -15x^2 + 4xy \\
6 \quad & (6x^2 - 9xy) \div 3x - (4xy - 10y^2) \div 2y \\
& = \frac{6x^2 - 9xy}{3x} - \frac{4xy - 10y^2}{2y} \\
& = 2x - 3y - (2x - 5y) \\
& = 2x - 3y - 2x + 5y = 2y \\
7 \quad & (4a^3 - 6a^2b) \div 2a - (9b^3 + 6ab^2) \div 3b \\
& = \frac{4a^3 - 6a^2b}{2a} - \frac{9b^3 + 6ab^2}{3b} \\
& = 2a^2 - 3ab - (3b^2 + 2ab) \\
& = 2a^2 - 3ab - 3b^2 - 2ab = 2a^2 - 3b^2 - 5ab \\
8 \quad & (12x^2y - 9xy^2) \div 3xy + (16x^2 - 8x) \div (-4x) \\
& = \frac{12x^2y - 9xy^2}{3xy} + \frac{16x^2 - 8x}{-4x} \\
& = 4x - 3y + (-4x + 2) \\
& = 4x - 3y - 4x + 2 = -3y + 2 \\
9 \quad & \frac{5x^2 + 3xy}{x} - \frac{3xy - 4y^2}{y} = 5x + 3y - (3x - 4y) \\
& = 5x + 3y - 3x + 4y \\
& = 2x + 7y \\
10 \quad & \frac{12x^2 - 8xy}{4x} - \frac{12x^2y + 9xy^2}{3xy} = 3x - 2y - (4x + 3y) \\
& = 3x - 2y - 4x - 3y \\
& = -x - 5y \\
11 \quad & \frac{9a^2 - 6ab}{3a} - \frac{28a^2 + 14ab}{7a} = 3a - 2b - (4a + 2b) \\
& = 3a - 2b - 4a - 2b \\
& = -a - 4b \\
12 \quad & \frac{16a^2 + 8a^2b}{a} + \frac{5a^3b - 3a^2b^2}{ab} \\
& = 16a + 8ab + 5a^2 - 3ab = 5a^2 + 5ab + 16a \\
14 \quad & y(3x - 2y) + (24y^3 - 18xy^2) \div 6y \\
& = y(3x - 2y) + \frac{24y^3 - 18xy^2}{6y} \\
& = 3xy - 2y^2 + 4y^2 - 3xy = 2y^2 \\
15 \quad & (8x^3y^2 - 4x^2y^3) \div 2xy + xy(2x + y) \\
& = \frac{8x^3y^2 - 4x^2y^3}{2xy} + xy(2x + y) \\
& = 4x^2y - 2xy^2 + 2x^2y + xy^2 = 6x^2y - xy^2 \\
16 \quad & -5x(3x + 2y) - (3x^3y - 4x^2y^2) \div (-xy) \\
& = -5x(3x + 2y) - \frac{3x^3y - 4x^2y^2}{-xy} \\
& = -15x^2 - 10xy - (-3x^2 + 4xy) \\
& = -15x^2 - 10xy + 3x^2 - 4xy \\
& = -12x^2 - 14xy
\end{aligned}$$

$$\begin{aligned}
17 \quad & 3a\left(3a - \frac{4}{3}b\right) + (2a^2b - 6ab^2) \div 2b \\
& = 3a\left(3a - \frac{4}{3}b\right) + \frac{2a^2b - 6ab^2}{2b} \\
& = 9a^2 - 4ab + a^2 - 3ab = 10a^2 - 7ab \\
18 \quad & (6x^3y - 3x^2y^2) \div \frac{3}{2}xy + 4x(x - 5y) \\
& = (6x^3y - 3x^2y^2) \times \frac{2}{3xy} + 4x(x - 5y) \\
& = 4x^2 - 2xy + 4x^2 - 20xy = 8x^2 - 22xy
\end{aligned}$$

STEP 2

기본연산 집중연습 | 23~25

p. 98 ~ p. 99

1 $8a^2 + 12ab$	2 $3x^2 - xy$
3 $2a^2b + 3ab^2$	4 $3x^2 - 6xy - 3x$
5 $-10a^2 + 15ab + 5ac$	6 $-14xy + 12y^2$
7 $21a^2b^2 - 28ab^3$	8 $-10x^2 + 20xy - 15x$
9 $4a - 1$	10 $-3x + 2y$
11 $5a + b$	12 $3x - 2y$
13 $8a - 12$	14 $-7x - 14y$
15 $6ab - 3b$	16 $15x - 10y$
17 $-9x^2 + 8xy$	18 $2a^2 - 7ab$
19 $-14x^2 + 13xy$	20 $3x - 5y$
21 $-xy + 2x$	22 $-7xy + 3x$
23 $5x - y$	24 $3x - 5y$
25 $x^2 - 10xy$	26 $5x^2 - 8x + 6$

$$\begin{aligned}
1 \quad & 4a(2a + 3b) = 4a \times 2a + 4a \times 3b = 8a^2 + 12ab \\
2 \quad & \frac{1}{3}x(9x - 3y) = \frac{1}{3}x \times 9x - \frac{1}{3}x \times 3y = 3x^2 - xy \\
3 \quad & ab(2a + 3b) = ab \times 2a + ab \times 3b = 2a^2b + 3ab^2 \\
4 \quad & 3x(x - 2y - 1) = 3x \times x - 3x \times 2y - 3x \times 1 \\
& = 3x^2 - 6xy - 3x \\
5 \quad & -5a(2a - 3b - c) \\
& = -5a \times 2a - (-5a) \times 3b - (-5a) \times c \\
& = -10a^2 + 15ab + 5ac \\
6 \quad & (7x - 6y) \times (-2y) = 7x \times (-2y) - 6y \times (-2y) \\
& = -14xy + 12y^2 \\
7 \quad & (3ab - 4b^2) \times 7ab = 3ab \times 7ab - 4b^2 \times 7ab \\
& = 21a^2b^2 - 28ab^3 \\
8 \quad & (2x - 4y + 3) \times (-5x) \\
& = 2x \times (-5x) - 4y \times (-5x) + 3 \times (-5x) \\
& = -10x^2 + 20xy - 15x
\end{aligned}$$

$$\begin{aligned}
9 \quad (12a^2 - 3a) \div 3a &= \frac{12a^2 - 3a}{3a} \\
&= \frac{12a^2}{3a} - \frac{3a}{3a} = 4a - 1 \\
10 \quad (6x^2 - 4xy) \div (-2x) &= \frac{6x^2 - 4xy}{-2x} \\
&= \frac{6x^2}{-2x} - \frac{4xy}{-2x} \\
&= -3x + 2y \\
11 \quad (25a^2 + 5ab) \div 5a &= \frac{25a^2 + 5ab}{5a} \\
&= \frac{25a^2}{5a} + \frac{5ab}{5a} = 5a + b \\
12 \quad (9x^2y - 6xy^2) \div 3xy &= \frac{9x^2y - 6xy^2}{3xy} \\
&= \frac{9x^2y}{3xy} - \frac{6xy^2}{3xy} = 3x - 2y \\
13 \quad (6a^2 - 9a) \div \frac{3}{4}a &= (6a^2 - 9a) \times \frac{4}{3a} \\
&= 8a - 12 \\
14 \quad (5x^2 + 10xy) \div \left(-\frac{5}{7}x\right) &= (5x^2 + 10xy) \times \left(-\frac{7}{5x}\right) \\
&= -7x - 14y \\
15 \quad (8a^2b - 4ab) \div \frac{4}{3}a &= (8a^2b - 4ab) \times \frac{3}{4a} \\
&= 6ab - 3b \\
16 \quad (18x^2y - 12xy^2) \div \frac{6}{5}xy &= (18x^2y - 12xy^2) \times \frac{5}{6xy} \\
&= 15x - 10y \\
17 \quad 2x(3x + y) - 3x(5x - 2y) &= 6x^2 + 2xy - 15x^2 + 6xy = -9x^2 + 8xy \\
18 \quad -4a(a - 2b) + 3a(2a - 5b) &= -4a^2 + 8ab + 6a^2 - 15ab = 2a^2 - 7ab \\
19 \quad 5x(-2x + y) - 4x(x - 2y) &= -10x^2 + 5xy - 4x^2 + 8xy = -14x^2 + 13xy \\
20 \quad (8x^2 - 6xy) \div 2x - (7xy + 14y^2) \div 7y &= \frac{8x^2 - 6xy}{2x} - \frac{7xy + 14y^2}{7y} \\
&= 4x - 3y - (x + 2y) \\
&= 4x - 3y - x - 2y = 3x - 5y \\
21 \quad (x^2y - 3xy) \div (-x) + (4xy^2 - 6y^3) \div 2y^2 &= \frac{x^2y - 3xy}{-x} + \frac{4xy^2 - 6y^3}{2y^2} \\
&= -xy + 3y + 2x - 3y = -xy + 2x
\end{aligned}$$

$$\begin{aligned}
22 \quad (-3y + 2) \div \frac{1}{3x} + (15x^2 - 10x^2y) \div (-5x) &= (-3y + 2) \times 3x + \frac{15x^2 - 10x^2y}{-5x} \\
&= -9xy + 6x - 3x + 2xy = -7xy + 3x \\
23 \quad \frac{24x^2 - 9xy}{3x} - \frac{15xy - 10y^2}{5y} &= 8x - 3y - (3x - 2y) \\
&= 8x - 3y - 3x + 2y = 5x - y \\
24 \quad \frac{8x^2 - 6xy}{2x} - \frac{7x^2y + 14xy^2}{7xy} &= 4x - 3y - (x + 2y) \\
&= 4x - 3y - x - 2y = 3x - 5y \\
25 \quad 4x(x - y) - (2x^2y^2 + x^3y) \div \frac{1}{3}xy &= 4x(x - y) - (2x^2y^2 + x^3y) \times \frac{3}{xy} \\
&= 4x^2 - 4xy - (6xy + 3x^2) \\
&= 4x^2 - 4xy - 6xy - 3x^2 = x^2 - 10xy \\
26 \quad (2x^2 - 4x) \div \left(-\frac{2}{3}x\right) + 5x(x - 1) &= (2x^2 - 4x) \times \left(-\frac{3}{2x}\right) + 5x(x - 1) \\
&= -3x + 6 + 5x^2 - 5x = 5x^2 - 8x + 6
\end{aligned}$$

STEP 3

기본연산 테스트

p. 100 ~ p. 101

- (1) a^5 (2) a^{12} (3) a^6 (4) 1 (5) $\frac{1}{x^6}$ (6) a^8b^{12} (7) $\frac{x^{10}}{y^6}$
- (1) 3 (2) 8 (3) 6 (4) 5 (5) 4
- (1) $18x^3y$ (2) $-54xy^3$ (3) $-40x^4y^2$ (4) $-12x^5y^4$
(5) $-9x^5y^4$ (6) $12ab^4$ (7) $-\frac{2x}{y}$ (8) $48x^5y$ (9) $9x^2y^3$
(10) $24x^3y$
- $4x^4y^2$
- (1) ○ (2) × (3) ○ (4) × (5) ○
- (1) $7a + b$ (2) $5x + 4y + 6$ (3) $-a + 7b$
(4) $-5x + 7y - 8$ (5) $\frac{7x + 13y}{12}$ (6) $\frac{-x + 5y}{6}$
- (1) $4x^2 + 2x - 4$ (2) $6x^2 - 12x - 6$ (3) $-2x - 11y$
(4) $-6x^2 + x + 3$
- (1) $6x^2 - 3x$ (2) $6x^2 - 9xy + 12x$ (3) $-3x - 1$
(4) $6x - 4$ (5) $3x^2 + 8$ (6) $8x - 3y$ (7) $x + 5y$

2 (1) $a^{\square} \times a^4 = a^{\square+4} = a^7$ 에 대하여 $\square + 4 = 7 \quad \therefore \square = 3$
 (2) $a^5 \div a^{\square} = \frac{1}{a^{\square-5}} = \frac{1}{a^3}$ 에 대하여 $\square - 5 = 3 \quad \therefore \square = 8$
 (3) $(x^{\square}y^3)^2 = x^{\square \times 2}y^{3 \times 2} = x^{12}y^6$ 에 대하여
 $\square \times 2 = 12 \quad \therefore \square = 6$
 (4) $(x^2y^{\square})^3 = x^{2 \times 3}y^{\square \times 3} = x^6y^{15}$ 에 대하여
 $\square \times 3 = 15 \quad \therefore \square = 5$
 (5) $\left(\frac{a^2}{b^{\square}}\right)^4 = \frac{a^{2 \times 4}}{b^{\square \times 4}} = \frac{a^8}{b^{16}}$ 에 대하여 $\square \times 4 = 16 \quad \therefore \square = 4$

3 (2) $2x \times (-3y)^3 = 2x \times (-27y^3) = -54xy^3$
 (3) $(-2x)^3 \times 5xy^2 = -8x^3 \times 5xy^2 = -40x^4y^2$
 (4) $(-2x^2y)^2 \times (-3xy^2) = 4x^4y^2 \times (-3xy^2)$
 $= -12x^5y^4$
 (5) $-3x^2 \times \left(-\frac{3}{2}y\right)^2 \times \frac{4}{3}x^3y^2 = -3x^2 \times \frac{9}{4}y^2 \times \frac{4}{3}x^3y^2$
 $= -9x^5y^4$
 (6) $9a^2b^5 \div \frac{3}{4}ab = 9a^2b^5 \times \frac{4}{3ab} = 12ab^4$
 (7) $(2xy)^3 \div (-4x^2y^4) = 8x^3y^3 \div (-4x^2y^4)$
 $= \frac{8x^3y^3}{-4x^2y^4} = -\frac{2x}{y}$
 (8) $(-12x^3y)^2 \div 3xy = 144x^6y^2 \div 3xy$
 $= \frac{144x^6y^2}{3xy} = 48x^5y$
 (9) $(-6x^3y)^2 \div 4x^5y \times xy^2 = 36x^6y^2 \times \frac{1}{4x^5y} \times xy^2$
 $= 9x^2y^3$
 (10) $3x^2y \times (-2xy)^3 \div (-x^2y^3)$
 $= 3x^2y \times (-8x^3y^3) \times \left(-\frac{1}{x^2y^3}\right) = 24x^3y$

4 $(-4x^3)^2 \times 2xy^3 \div \square = 8x^3y$ 에 대하여
 $16x^6 \times 2xy^3 \times \frac{1}{\square} = 8x^3y$
 $32x^7y^3 \times \frac{1}{\square} = 8x^3y \quad \therefore \square = \frac{32x^7y^3}{8x^3y} = 4x^4y^2$

5 (4) $x^2 - x(x+1) - 2 = x^2 - x^2 - x - 2 = -x - 2$
 따라서 x 에 대한 이차식이 아니다.
 (5) $2x^2 - x(x+3) = 2x^2 - x^2 - 3x = x^2 - 3x$
 따라서 x 에 대한 이차식이다.

6 (2) $(2x - 11y + 3) + 3(x + 5y + 1)$
 $= 2x - 11y + 3 + 3x + 15y + 3 = 5x + 4y + 6$
 (3) $(2a + 3b) - (3a - 4b) = 2a + 3b - 3a + 4b$
 $= -a + 7b$
 (4) $-2(x - 4y + 7) - (3x + y - 6)$
 $= -2x + 8y - 14 - 3x - y + 6 = -5x + 7y - 8$

(5) $\frac{x+5y}{4} + \frac{2x-y}{6} = \frac{3(x+5y) + 2(2x-y)}{12}$
 $= \frac{3x + 15y + 4x - 2y}{12}$
 $= \frac{7x + 13y}{12}$
 (6) $\frac{x-2y}{3} - \frac{x-3y}{2} = \frac{2(x-2y) - 3(x-3y)}{6}$
 $= \frac{2x - 4y - 3x + 9y}{6}$
 $= \frac{-x + 5y}{6}$

7 (1) $3(x^2 - x + 1) + (x^2 + 5x - 7)$
 $= 3x^2 - 3x + 3 + x^2 + 5x - 7 = 4x^2 + 2x - 4$
 (2) $4(2x^2 - 4x + 1) - 2(x^2 - 2x + 5)$
 $= 8x^2 - 16x + 4 - 2x^2 + 4x - 10$
 $= 6x^2 - 12x - 6$
 (3) $5x - [3x - \{x - 7y - (5x + 4y)\}]$
 $= 5x - \{3x - (x - 7y - 5x - 4y)\}$
 $= 5x - \{3x - (-4x - 11y)\}$
 $= 5x - (3x + 4x + 11y)$
 $= 5x - (7x + 11y)$
 $= 5x - 7x - 11y = -2x - 11y$
 (4) $-3x^2 + 2 - \{5x^2 - 1 - (2x^2 + x)\}$
 $= -3x^2 + 2 - (5x^2 - 1 - 2x^2 - x)$
 $= -3x^2 + 2 - (3x^2 - x - 1)$
 $= -3x^2 + 2 - 3x^2 + x + 1 = -6x^2 + x + 3$

8 (1) $x(6x - 3) = x \times 6x - x \times 3 = 6x^2 - 3x$
 (2) $-3x(-2x + 3y - 4)$
 $= -3x \times (-2x) + (-3x) \times 3y - (-3x) \times 4$
 $= 6x^2 - 9xy + 12x$
 (3) $(12x^2 + 4x) \div (-4x) = \frac{12x^2 + 4x}{-4x}$
 $= \frac{12x^2}{-4x} + \frac{4x}{-4x}$
 $= -3x - 1$
 (4) $(9x^2 - 6x) \div \frac{3}{2}x = (9x^2 - 6x) \times \frac{2}{3x} = 6x - 4$
 (5) $2(x + 4) + x(3x - 2) = 2x + 8 + 3x^2 - 2x$
 $= 3x^2 + 8$
 (6) $\frac{20x^2 - 5xy}{5x} - \frac{16xy - 8y^2}{-4y} = 4x - y - (-4x + 2y)$
 $= 4x - y + 4x - 2y$
 $= 8x - 3y$
 (7) $(15x^2 - 6xy) \div 3x - (20xy - 35y^2) \times \frac{1}{5y}$
 $= \frac{15x^2 - 6xy}{3x} - (20xy - 35y^2) \times \frac{1}{5y}$
 $= 5x - 2y - (4x - 7y)$
 $= 5x - 2y - 4x + 7y = x + 5y$

3 부등식

STEP 1

01 부등식

p. 104

- | | |
|------|------|
| 1 ○ | 2 × |
| 3 × | 4 ○ |
| 5 × | 6 ○ |
| 7 ○ | 8 × |
| 9 × | 10 ○ |
| 11 ○ | 12 × |

02 부등식의 표현

p. 105

- | | |
|---------------|---------------|
| 1 $\geq$ | 2 $x < 3$ |
| 3 $x \leq 9$ | 4 $x > -2$ |
| 5 $x < 7$ | 6 $x \leq -4$ |
| 7 $x \geq -1$ | 8 $x \leq 10$ |
| 9 $x > -6$ | 10 $x \geq 8$ |

03 문장을 부등식으로 나타내기

p. 106 ~ p. 107

- | | |
|---------------------------|-----------------------|
| 1 $<$ | 2 $x - 5 > 10$ |
| 3 $2x \geq 10$ | 4 $25 - x \leq 5$ |
| 5 $2x \geq x + 7$ | 6 $3x - 1 \leq 10$ |
| 7 $10 + 3x < 17$ | 8 $7(x - 3) \leq 4x$ |
| 9 $800x > 7000$ | 10 $10x \leq 12000$ |
| 11 $1500 + 1000x < 10000$ | 12 $40 - x \geq 20$ |
| 13 $x + 15 \leq 2x$ | 14 $x + 8 \geq 120$ |
| 15 $4x \geq 10$ | 16 $6x > 30$ |
| 17 $8x \leq 5$ | 18 $\frac{x}{40} < 2$ |

04 부등식의 해

p. 108

- | | |
|-----|------|
| 1 ○ | 2 × |
| 3 × | 4 ○ |
| 5 × | 6 ○ |
| 7 ○ | 8 × |
| 9 ○ | 10 × |

1 $x=3$ 을 부등식에 대입하면
 $2 \times 3 \geq -1$ (참)

2 $x=3$ 을 부등식에 대입하면
 $3 + 2 \leq -1$ (거짓)

3 $x=3$ 을 부등식에 대입하면
 $3 \times 3 < 3 - 1$ (거짓)

4 $x=3$ 을 부등식에 대입하면
 $3 > -3 \times 3 + 2$ (참)

6 $x=-2$ 를 부등식에 대입하면
 $3 - (-2) \geq 4$ (참)

7 $x=1$ 을 부등식에 대입하면
 $2 \times 1 - 5 > -4$ (참)

8 $x=3$ 을 부등식에 대입하면
 $4 - 2 \times 3 \leq -3$ (거짓)

9 $x=-3$ 을 부등식에 대입하면
 $1 - 2 \times (-3) > 5$ (참)

10 $x=2$ 를 부등식에 대입하면
 $3 \times 2 + 1 \leq 5$ (거짓)

05 부등식을 푼다

p. 109

1	x 의 값	좌변	부등호	우변	참, 거짓 판별
	-2	$3 \times (-2) - 2 = -8$	$<$	-5	거짓
	-1	$3 \times (-1) - 2 = -5$	$=$	-5	거짓
	0	$3 \times 0 - 2 = -2$	$>$	-5	참
	1	$3 \times 1 - 2 = 1$	$>$	-5	참
	2	$3 \times 2 - 2 = 4$	$>$	-5	참

0, 1, 2

2	x 의 값	좌변	부등호	우변	참, 거짓 판별
	-2	$4 \times (-2) - 3 = -11$	$<$	1	참
	-1	$4 \times (-1) - 3 = -7$	$<$	1	참
	0	$4 \times 0 - 3 = -3$	$<$	1	참
	1	$4 \times 1 - 3 = 1$	$=$	1	참
	2	$4 \times 2 - 3 = 5$	$>$	1	거짓

-2, -1, 0, 1

- | | |
|--------|-----------|
| 3 2, 3 | 4 2, 3, 4 |
| 5 4, 5 | 6 3, 4, 5 |

- 3 $x=2$ 일 때, $6-2>2$ (참)
 $x=3$ 일 때, $6-3>2$ (참)
 $x=4$ 일 때, $6-4>2$ (거짓)
 $x=5$ 일 때, $6-5>2$ (거짓)
따라서 부등식의 해는 2, 3이다.
- 4 $x=2$ 일 때, $2 \times 2 + 3 \leq 11$ (참)
 $x=3$ 일 때, $2 \times 3 + 3 \leq 11$ (참)
 $x=4$ 일 때, $2 \times 4 + 3 \leq 11$ (참)
 $x=5$ 일 때, $2 \times 5 + 3 \leq 11$ (거짓)
따라서 부등식의 해는 2, 3, 4이다.
- 5 $x=2$ 일 때, $4 \times 2 - 14 \geq 2$ (거짓)
 $x=3$ 일 때, $4 \times 3 - 14 \geq 2$ (거짓)
 $x=4$ 일 때, $4 \times 4 - 14 \geq 2$ (참)
 $x=5$ 일 때, $4 \times 5 - 14 \geq 2$ (참)
따라서 부등식의 해는 4, 5이다.
- 6 $x=2$ 일 때, $7-2<5 \times 2-5$ (거짓)
 $x=3$ 일 때, $7-3<5 \times 3-5$ (참)
 $x=4$ 일 때, $7-4<5 \times 4-5$ (참)
 $x=5$ 일 때, $7-5<5 \times 5-5$ (참)
따라서 부등식의 해는 3, 4, 5이다.

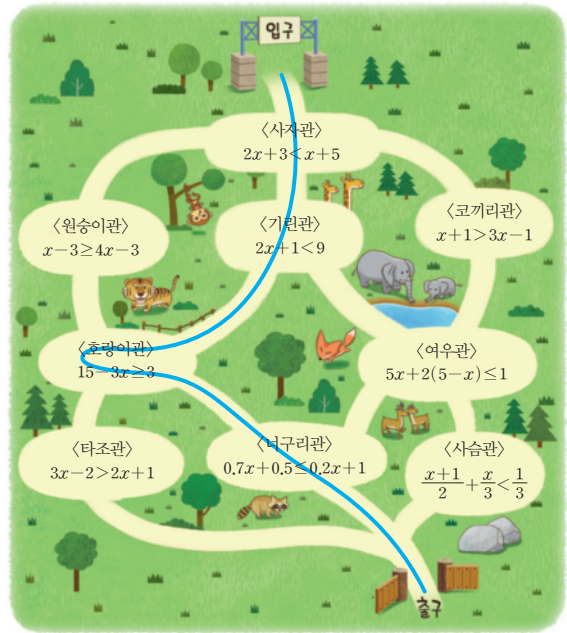
STEP 2

기본연산 집중연습 | 01~05

p. 110 ~ p. 111

- | | |
|-------------------------|-----------------------------|
| 1 ○ | 2 × |
| 3 × | 4 ○ |
| 5 ○ | 6 × |
| 7 × | 8 ○ |
| 9 $x \leq 4$ | 10 $2x > 10$ |
| 11 $4x - 3 \geq -5$ | 12 $3x + 1 > 2x$ |
| 13 $3(x-6) < 7x$ | 14 $\frac{5}{4}x \leq 4000$ |
| 15 사자관, 기린관, 호랑이관, 너구리관 | |

15



STEP 1

06 부등식의 성질 (1)

p. 112 ~ p. 113

- | | |
|-----------|------|
| 1 ≤ | 2 ≤ |
| 3 ≤ | 4 ≥ |
| 5 ≤ | 6 ≤ |
| 7 ≥, ≥, ≥ | 8 ≥ |
| 9 ≤ | 10 ≥ |
| 11 > | 12 > |
| 13 < | 14 > |
| 15 > | 16 > |
| 17 < | 18 < |
| 19 < | 20 < |
| 21 > | 22 < |

5 $a \leq b$
 $2a \leq 2b$
 $\therefore 2a+1 \leq 2b+1$

6 $a \leq b$
 $\frac{a}{7} \leq \frac{b}{7}$
 $\therefore \frac{a}{7} - 3 \leq \frac{b}{7} - 3$

8 $a \leq b$
 $-\frac{2}{5}a \geq -\frac{2}{5}b$
 $\therefore -\frac{2}{5}a+1 \geq -\frac{2}{5}b+1$

9 $a \leq b$
 $a-1 \leq b-1$
 $\therefore 5(a-1) \leq 5(b-1)$

10 $a \leq b$
 $a+6 \leq b+6$
 $\therefore -(a+6) \geq -(b+6)$

15 $a > b$
 $7a > 7b$
 $\therefore 7a-3 > 7b-3$

16 $a > b$
 $3a > 3b$
 $\therefore 2+3a > 2+3b$

17 $a > b$
 $-2a < -2b$
 $\therefore -2a+1 < -2b+1$

18 $a > b$
 $-3a < -3b$
 $\therefore -3a-6 < -3b-6$

19 $a > b$
 $-7a < -7b$
 $\therefore 8-7a < 8-7b$

20 $a > b$
 $-\frac{a}{4} < -\frac{b}{4}$
 $\therefore 5-\frac{a}{4} < 5-\frac{b}{4}$

21 $a > b$
 $a+1 > b+1$
 $\therefore 2(a+1) > 2(b+1)$

22 $a > b$
 $a-3 > b-3$
 $\therefore -(a-3) < -(b-3)$

07 부등식의 성질 (2)

p. 114 ~ p. 115

1 $>$	2 $\leq$
3 $\geq$	4 $<$
5 $\leq$	6 $\geq$
7 $<$	8 $>$
9 $>$	10 $\leq$
11 $<$	12 $\geq$
13 $>, <, >$	14 $<$
15 $<$	16 $>$
17 $\leq$	18 $>$
19 $\geq$	20 $<$
21 $\leq$	22 $>$

5 $5a+3 \leq 5b+3$
 $5a \leq 5b$
 $\therefore a \leq b$

6 $4a-13 \geq 4b-13$
 $4a \geq 4b$
 $\therefore a \geq b$

7 $\frac{1}{7}a-4 < \frac{1}{7}b-4$
 $\frac{1}{7}a < \frac{1}{7}b$
 $\therefore a < b$

8 $6+\frac{1}{3}a > 6+\frac{1}{3}b$
 $\frac{1}{3}a > \frac{1}{3}b$
 $\therefore a > b$

9 $\frac{a-1}{2} > \frac{b-1}{2}$
 $a-1 > b-1$
 $\therefore a > b$

10 $9(a+1) \leq 9(b+1)$
 $a+1 \leq b+1$
 $\therefore a \leq b$

14 $-a+1 > -b+1$
 $-a > -b$
 $\therefore a < b$

15 $3-5a > 3-5b$
 $-5a > -5b$
 $\therefore a < b$

16 $-\frac{1}{6}a-\frac{1}{3} < -\frac{1}{6}b-\frac{1}{3}$
 $-\frac{1}{6}a < -\frac{1}{6}b$
 $\therefore a > b$

17 $-\frac{2}{3}a+2 \geq -\frac{2}{3}b+2$
 $-\frac{2}{3}a \geq -\frac{2}{3}b$
 $\therefore a \leq b$

18 $-(a-1) < -(b-1)$
 $a-1 > b-1$
 $\therefore a > b$

19 $5a+1 \leq 5b+1$
 $5a \leq 5b$
 $a \leq b$
 $\therefore -a \geq -b$

20 $\frac{a}{4}-1 > \frac{b}{4}-1$
 $\frac{a}{4} > \frac{b}{4}$
 $a > b$
 $\therefore -a < -b$

21 $-3a+1 \geq -3b+1$
 $-3a \geq -3b$
 $a \leq b$
 $\therefore 2a \leq 2b$

22 $-2a+1 < -2b+1$
 $-2a < -2b$
 $a > b$
 $\therefore 3a > 3b$

08 식의 값의 범위 (1)

p. 116 ~ p. 117

1 $x+2 \geq 4$	2 $x-4 < -5$
3 $3x+3 \leq -3$	4 $5x+2 < 17$
5 $2x-5 > -3$	6 $4x-1 \leq -13$
7 $\frac{1}{5}x-3 \geq -4$	8 $\frac{3}{2}x-1 > 5$
9 $<, <$	10 $-x-2 \leq 5$
11 $-5x+2 \geq 17$	12 $-2x+3 > -7$
13 $-4x+1 > -3$	14 $7-2x < 25$
15 $-\frac{1}{2}x+5 \geq 7$	16 $-\frac{3}{5}x-1 \leq -7$

3 $x \leq -2$
 $3x \leq -6$
 $\therefore 3x+3 \leq -3$

4 $x < 3$
 $5x < 15$
 $\therefore 5x+2 < 17$

5 $x > 1$
 $2x > 2$
 $\therefore 2x-5 > -3$

6 $x \leq -3$
 $4x \leq -12$
 $\therefore 4x-1 \leq -13$

$$\begin{aligned} 7 \quad & x \geq -5 \\ & \frac{1}{5}x \geq -1 \\ \therefore & \frac{1}{5}x - 3 \geq -4 \end{aligned}$$

$$\begin{aligned} 10 \quad & x \geq -7 \\ & -x \leq 7 \\ \therefore & -x - 2 \leq 5 \end{aligned}$$

$$\begin{aligned} 11 \quad & x \leq -3 \\ & -5x \geq 15 \\ \therefore & -5x + 2 \geq 17 \end{aligned}$$

$$\begin{aligned} 13 \quad & x < 1 \\ & -4x > -4 \\ \therefore & -4x + 1 > -3 \end{aligned}$$

$$\begin{aligned} 15 \quad & x \leq -4 \\ & -\frac{1}{2}x \geq 2 \\ \therefore & -\frac{1}{2}x + 5 \geq 7 \end{aligned}$$

$$\begin{aligned} 8 \quad & x > 4 \\ & \frac{3}{2}x > 6 \\ \therefore & \frac{3}{2}x - 1 > 5 \end{aligned}$$

$$\begin{aligned} 12 \quad & x < 5 \\ & -2x > -10 \\ \therefore & -2x + 3 > -7 \end{aligned}$$

$$\begin{aligned} 14 \quad & x > -9 \\ & -2x < 18 \\ \therefore & 7 - 2x < 25 \end{aligned}$$

$$\begin{aligned} 16 \quad & x \geq 10 \\ & -\frac{3}{5}x \leq -6 \\ \therefore & -\frac{3}{5}x - 1 \leq -7 \end{aligned}$$

$$\begin{aligned} 8 \quad & -3 \leq x \leq 1 \\ & -1 \leq -x \leq 3 \\ \therefore & 1 \leq -x + 2 \leq 5 \end{aligned}$$

$$\begin{aligned} 9 \quad & -2 < x < 1 \\ & -4 < -4x < 8 \\ \therefore & 1 < -4x + 5 < 13 \end{aligned}$$

$$\begin{aligned} 11 \quad & -2 \leq x < 3 \\ & -6 < -2x \leq 4 \\ \therefore & -3 < 3 - 2x \leq 7 \end{aligned}$$

$$\begin{aligned} 13 \quad & -6 < x < 3 \\ & -2 < -\frac{2}{3}x < 4 \\ \therefore & -5 < -\frac{2}{3}x - 3 < 1 \end{aligned}$$

$$\begin{aligned} 10 \quad & -4 < x \leq 1 \\ & -2 \leq -2x < 8 \\ \therefore & -6 \leq -2x - 4 < 4 \end{aligned}$$

$$\begin{aligned} 12 \quad & 1 \leq x \leq 4 \\ & -20 \leq -5x \leq -5 \\ \therefore & -18 \leq 2 - 5x \leq -3 \end{aligned}$$

$$\begin{aligned} 14 \quad & -2 < x \leq 2 \\ & -1 \leq -\frac{1}{2}x < 1 \\ \therefore & 1 \leq -\frac{1}{2}x + 2 < 3 \end{aligned}$$

09 식의 값의 범위 (2)

p. 118 ~ p. 119

$$\begin{aligned} 1 \quad & -6 \leq 2x < 2, -6, 2, -4 \leq 2x + 2 < 4 \\ 2 \quad & -5 \leq 4x - 1 \leq 11 \\ 3 \quad & -7 < 3 + 5x \leq 23 \quad 4 \quad -10 < 3x - 7 < -4 \\ 5 \quad & 1 \leq \frac{1}{2}x + 1 < 3 \quad 6 \quad -3 < \frac{1}{3}x - 2 \leq -1 \\ 7 \quad & -1 < -3x \leq 12, -1, 12, -1, 12, 0 < -3x + 1 \leq 13 \\ 8 \quad & 1 \leq -x + 2 \leq 5 \\ 9 \quad & 1 < -4x + 5 < 13 \quad 10 \quad -6 \leq -2x - 4 < 4 \\ 11 \quad & -3 < 3 - 2x \leq 7 \quad 12 \quad -18 \leq 2 - 5x \leq -3 \\ 13 \quad & -5 < -\frac{2}{3}x - 3 < 1 \quad 14 \quad 1 \leq -\frac{1}{2}x + 2 < 3 \end{aligned}$$

$$\begin{aligned} 2 \quad & -1 \leq x \leq 3 \\ & -4 \leq 4x \leq 12 \\ \therefore & -5 \leq 4x - 1 \leq 11 \end{aligned}$$

$$\begin{aligned} 3 \quad & -2 < x \leq 4 \\ & -10 < 5x \leq 20 \\ \therefore & -7 < 3 + 5x \leq 23 \end{aligned}$$

$$\begin{aligned} 5 \quad & 0 \leq x < 4 \\ & 0 \leq \frac{1}{2}x < 2 \\ \therefore & 1 \leq \frac{1}{2}x + 1 < 3 \end{aligned}$$

$$\begin{aligned} 4 \quad & -1 < x < 1 \\ & -3 < 3x < 3 \\ \therefore & -10 < 3x - 7 < -4 \end{aligned}$$

$$\begin{aligned} 6 \quad & -3 < x \leq 3 \\ & -1 < \frac{1}{3}x \leq 1 \\ \therefore & -3 < \frac{1}{3}x - 2 \leq -1 \end{aligned}$$

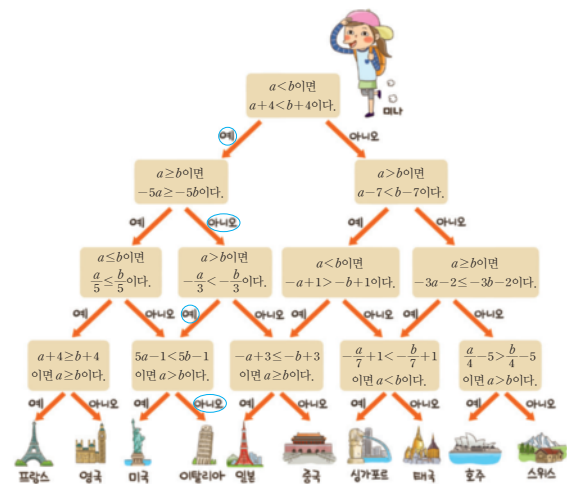
STEP 2

기본연산 집중연습 | 06~09

p. 120 ~ p. 121

$$\begin{aligned} 1 \quad & \text{이탈리아} \\ 2 \quad & 2x + 3 > 9 \quad 3 \quad 5x - 2 \leq 3 \\ 4 \quad & -x - 4 > -2 \quad 5 \quad 3 - 2x \leq 13 \\ 6 \quad & 2 - 4x \geq 14 \quad 7 \quad -\frac{1}{2}x + 1 > 0 \\ 8 \quad & -7 \leq 6x - 1 < 17 \quad 9 \quad 4 < \frac{1}{3}x + 4 < 6 \\ 10 \quad & -4 \leq -3x + 5 < 8 \quad 11 \quad -14 \leq -4x + 2 \leq -2 \\ 12 \quad & -9 \leq 1 - 2x < 1 \quad 13 \quad 1 < -\frac{1}{2}x + 6 \leq 7 \end{aligned}$$

1



2 $x > 3$
 $2x > 6$
 $\therefore 2x + 3 > 9$

4 $x < -2$
 $-x > 2$
 $\therefore -x - 4 > -2$

6 $x \leq -3$
 $-4x \geq 12$
 $\therefore 2 - 4x \geq 14$

8 $-1 \leq x < 3$
 $-6 \leq 6x < 18$
 $\therefore -7 \leq 6x - 1 < 17$

10 $-1 < x \leq 3$
 $-9 \leq -3x < 3$
 $\therefore -4 \leq -3x + 5 < 8$

11 $1 \leq x \leq 4$
 $-16 \leq -4x \leq -4$
 $\therefore -14 \leq -4x + 2 \leq -2$

12 $0 < x \leq 5$
 $-10 \leq -2x < 0$
 $\therefore -9 \leq 1 - 2x < 1$

3 $x \leq 1$
 $5x \leq 5$
 $\therefore 5x - 2 \leq 3$

5 $x \geq -5$
 $-2x \leq 10$
 $\therefore 3 - 2x \leq 13$

7 $x < 2$
 $-\frac{1}{2}x > -1$
 $\therefore -\frac{1}{2}x + 1 > 0$

9 $0 < x < 6$
 $0 < \frac{1}{3}x < 2$
 $\therefore 4 < \frac{1}{3}x + 4 < 6$

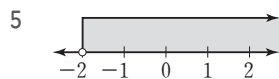
13 $-2 \leq x < 10$
 $-5 < -\frac{1}{2}x \leq 1$
 $\therefore 1 < -\frac{1}{2}x + 6 \leq 7$

STEP 1

10 부등식의 해를 수직선 위에 나타내기 p. 122

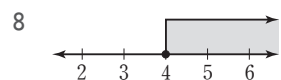
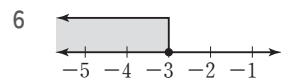
1 $x \geq -3$

3 $x < 4$



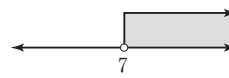
2 $x \leq 5$

4 $x > 0$

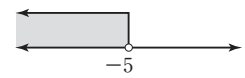


11 부등식의 성질을 이용한 부등식의 풀이 p. 123 ~ p. 124

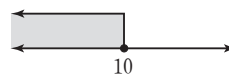
1 4, 4, 7



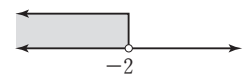
2 $x < -5$



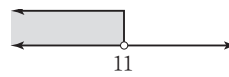
3 $x \leq 10$



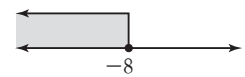
4 $x < -2$



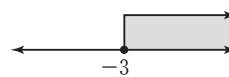
5 $x < 11$



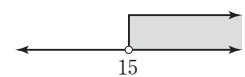
6 $x \leq -8$



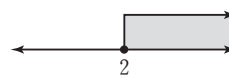
7 $x \geq -3$



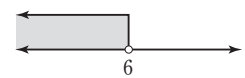
8 $x > 15$



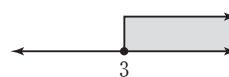
9 10, 5, 5, 2



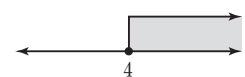
10 $x < 6$



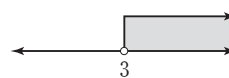
11 $x \geq 3$



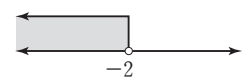
12 $x \geq 4$



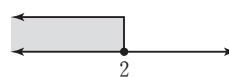
13 $x > 3$



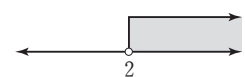
14 $x < -2$



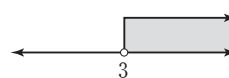
15 $x \leq 2$



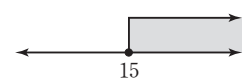
16 $x > 2$



17 $x > 3$



18 $x \geq 15$



2 $x + 2 < -3$

$x + 2 - 2 < -3 - 2$

$\therefore x < -5$

3 $\frac{x}{2} \leq 5$

$\frac{x}{2} \times 2 \leq 5 \times 2$

$\therefore x \leq 10$

4 $-3x > 6$

$\frac{-3x}{-3} < \frac{6}{-3}$

$\therefore x < -2$

5 $x - 7 < 4$

$x - 7 + 7 < 4 + 7$

$\therefore x < 11$

$$\begin{aligned} 6 \quad & -\frac{1}{2}x \geq 4 \\ & -\frac{1}{2}x \times (-2) \leq 4 \times (-2) \\ & \therefore x \leq -8 \end{aligned}$$

$$\begin{aligned} 7 \quad & x+5 \geq 2 \\ & x+5-5 \geq 2-5 \\ & \therefore x \geq -3 \end{aligned}$$

$$\begin{aligned} 8 \quad & \frac{2}{3}x > 10 \\ & \frac{2}{3}x \times \frac{3}{2} > 10 \times \frac{3}{2} \\ & \therefore x > 15 \end{aligned}$$

$$\begin{aligned} 10 \quad & 2x-5 < 7 \\ & 2x-5+5 < 7+5 \\ & 2x < 12 \\ & \frac{2x}{2} < \frac{12}{2} \\ & \therefore x < 6 \end{aligned}$$

$$\begin{aligned} 11 \quad & 6x-5 \geq 13 \\ & 6x-5+5 \geq 13+5 \\ & 6x \geq 18 \\ & \frac{6x}{6} \geq \frac{18}{6} \\ & \therefore x \geq 3 \end{aligned}$$

$$\begin{aligned} 12 \quad & -\frac{1}{2}x+3 \leq 1 \\ & -\frac{1}{2}x+3-3 \leq 1-3 \\ & -\frac{1}{2}x \leq -2 \\ & -\frac{1}{2}x \times (-2) \geq -2 \times (-2) \\ & \therefore x \geq 4 \end{aligned}$$

$$\begin{aligned} 13 \quad & -3x+2 < -7 \\ & -3x+2-2 < -7-2 \\ & -3x < -9 \\ & \frac{-3x}{-3} > \frac{-9}{-3} \\ & \therefore x > 3 \end{aligned}$$

$$\begin{aligned} 14 \quad & -5x-6 > 4 \\ & -5x-6+6 > 4+6 \\ & -5x > 10 \\ & \frac{-5x}{-5} < \frac{10}{-5} \\ & \therefore x < -2 \end{aligned}$$

$$\begin{aligned} 15 \quad & 3x-1 \leq 5 \\ & 3x-1+1 \leq 5+1 \\ & 3x \leq 6 \\ & \frac{3x}{3} \leq \frac{6}{3} \\ & \therefore x \leq 2 \end{aligned}$$

$$\begin{aligned} 16 \quad & -7x+5 < -9 \\ & -7x+5-5 < -9-5 \\ & -7x < -14 \\ & \frac{-7x}{-7} > \frac{-14}{-7} \\ & \therefore x > 2 \end{aligned}$$

$$\begin{aligned} 17 \quad & 4x-2 > 10 \\ & 4x-2+2 > 10+2 \\ & 4x > 12 \\ & \frac{4x}{4} > \frac{12}{4} \\ & \therefore x > 3 \end{aligned}$$

$$\begin{aligned} 18 \quad & \frac{1}{3}x-4 \geq 1 \\ & \frac{1}{3}x-4+4 \geq 1+4 \\ & \frac{1}{3}x \geq 5 \\ & \frac{1}{3}x \times 3 \geq 5 \times 3 \\ & \therefore x \geq 15 \end{aligned}$$

12 일차부등식

p. 125

1 ×	2 ○
3 ○	4 ×
5 ×	6 ×
7 ○	8 ×
9 ○	10 ×
11 ○	12 ×

3 $3x-2 \leq -3x+2$ 에서 $6x-4 \leq 0$ (일차부등식)

6 $4x > 4(x-1)$ 에서 $4x > 4x-4$
 $\therefore 4 > 0$ (일차부등식이 아니다.)

9 $3x^2-x+4 \leq 2+3x^2$ 에서 $-x+2 \leq 0$ (일차부등식)

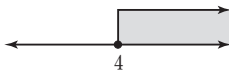
11 $x(x+2) > x^2$ 에서 $x^2+2x > x^2$
 $\therefore 2x > 0$ (일차부등식)

12 $x-2 < x+6$ 에서 $-8 < 0$ (일차부등식이 아니다.)

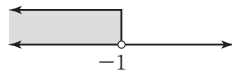
13 일차부등식의 풀이 (1)

p. 126 ~ p. 127

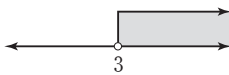
1 $1, 8, 4$



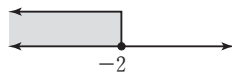
2 $x < -1$



3 $x > 3$



4 $x \leq -2$



5 $x > -1$

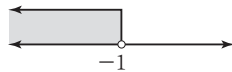
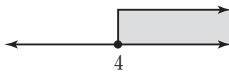
6 $x \leq 6$

7 $x \geq -3$

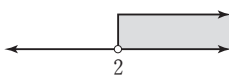
8 $x < 3$

9 $3x, -x, 4$

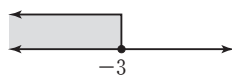
10 $x < -1$



11 $x > 2$



12 $x \leq -3$



13 $x \geq 1$

14 $x > 2$

15 $x < -4$

16 $x < 2$

17 $x \leq 4$

18 $x \leq 1$

19 $x < -\frac{1}{3}$

20 $x \leq -4$

2 $3x+2 < -1$

$3x < -3$

$\therefore x < -1$

3 $-3x+2 < -7$

$-3x < -9$

$\therefore x > 3$

4 $-4x+2 \geq 10$

$-4x \geq 8$

$\therefore x \leq -2$

5 $2x-1 > -3$

$2x > -2$

$\therefore x > -1$

6 $3x-5 \leq 13$

$3x \leq 18$

$\therefore x \leq 6$

7 $-5x-3 \leq 12$

$-5x \leq 15$

$\therefore x \geq -3$

8 $-7x+1 > -20$

$-7x > -21$

$\therefore x < 3$

10 $-x > 2x+3$

$-3x > 3$

$\therefore x < -1$

11 $4x > x+6$

$3x > 6$

$\therefore x > 2$

12 $5x \leq 2x-9$

$3x \leq -9$

$\therefore x \leq -3$

13 $2x \geq -3x+5$

$5x \geq 5$

$\therefore x \geq 1$

14 $-x < 5x-12$

$-6x < -12$

$\therefore x > 2$

15 $-4x < -6x-8$

$2x < -8$

$\therefore x < -4$

16 $4x > 5x-2$

$-x > -2$

$\therefore x < 2$

17 $x \geq 3x-8$

$-2x \geq -8$

$\therefore x \leq 4$

18 $3x \leq x+2$

$2x \leq 2$

$\therefore x \leq 1$

19 $-3x > 3x+2$

$-6x > 2$

$\therefore x < -\frac{1}{3}$

20 $2x \leq -12-x$

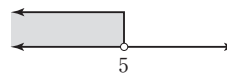
$3x \leq -12$

$\therefore x \leq -4$

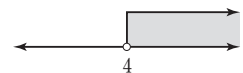
14 일차부등식의 풀이 (2)

p. 128 ~ p. 129

1 $3x, 6, 2, 10, 5$



2 $x > 4$



3 $x \geq 2$



4 $x \leq 1$



5 $x \leq 4$

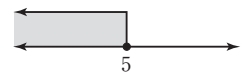
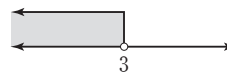
6 $x < -3$

7 $x > 3$

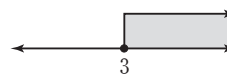
8 $x \geq 1$

9 $x, 1, -3, -9, 3$

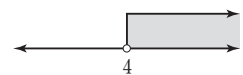
10 $x \leq 5$



11 $x \geq 3$



12 $x > 4$



13 $x < 0$

14 $x > -6$

15 $x \leq -5$

16 $x \geq -4$

17 $x > 1$

18 $x \leq -1$

19 $x < 2$

20 $x > 3$

2 $4x-5 > x+7$

$3x > 12$

$\therefore x > 4$

3 $2x-5 \geq -x+1$

$3x \geq 6$

$\therefore x \geq 2$

4 $2x+4 \leq -3x+9$

$5x \leq 5$

$\therefore x \leq 1$

5 $4x-6 \leq x+6$

$3x \leq 12$

$\therefore x \leq 4$

6 $5x+3 < 2x-6$

$3x < -9$

$\therefore x < -3$

- 7 $3x-5 > x+1$
 $2x > 6$
 $\therefore x > 3$
- 10 $12-4x \geq -x-3$
 $-3x \geq -15$
 $\therefore x \leq 5$
- 11 $-4x+5 \leq -3x+2$
 $-x \leq -3$
 $\therefore x \geq 3$
- 13 $-x-1 > x-1$
 $-2x > 0$
 $\therefore x < 0$
- 15 $2x-3 \geq 4x+7$
 $-2x \geq 10$
 $\therefore x \leq -5$
- 17 $-x+4 < 3x$
 $-4x < -4$
 $\therefore x > 1$
- 19 $9-3x > 2x-1$
 $-5x > -10$
 $\therefore x < 2$
- 8 $4x-1 \geq -2x+5$
 $6x \geq 6$
 $\therefore x \geq 1$
- 12 $-3x+1 < -x-7$
 $-2x < -8$
 $\therefore x > 4$
- 14 $3x-2 < 5x+10$
 $-2x < 12$
 $\therefore x > -6$
- 16 $2x+2 \leq 3x+6$
 $-x \leq 4$
 $\therefore x \geq -4$
- 18 $x-3 \geq 2x-2$
 $-x \geq 1$
 $\therefore x \leq -1$
- 20 $5-3x < -1-x$
 $-2x < -6$
 $\therefore x > 3$

- 5 $x(x+5) \geq x^2-1$ 에서 $x^2+5x \geq x^2-1$
 $\therefore 5x+1 \geq 0$ (일차부등식)
- 7 $-2x+12 > 6x-4$
 $-8x > -16$
 $\therefore x < 2$
- 9 $3x+2 \leq x+8$
 $2x \leq 6$
 $\therefore x \leq 3$
- 11 $5x+32 > x+8$
 $4x > -24$
 $\therefore x > -6$
- 13 $8x+4 \geq x-10$
 $7x \geq -14$
 $\therefore x \geq -2$
- 15 $5x-20 < 2x+1$
 $3x < 21$
 $\therefore x < 7$
- 17 A $\Rightarrow 2-2x < x+5$
 $-3x < 3$
 $\therefore x > -1$
C $\Rightarrow 6x-2 > 4x-12$
 $2x > -10$
 $\therefore x > -5$
E $\Rightarrow x-2 > 3x+2$
 $-2x > 4$
 $\therefore x < -2$
- 8 $2x-4 \geq -x+2$
 $3x \geq 6$
 $\therefore x \geq 2$
- 10 $2x-5 < 4x+11$
 $-2x < 16$
 $\therefore x > -8$
- 12 $-3x-2 \leq x+6$
 $-4x \leq 8$
 $\therefore x \geq -2$
- 14 $9x+4 < 5x+2$
 $4x < -2$
 $\therefore x < -\frac{1}{2}$
- 16 $-3x+2 \geq x+6$
 $-4x \geq 4$
 $\therefore x \leq -1$
- 17 B $\Rightarrow x-1 \geq 3x-5$
 $-2x \geq -4$
 $\therefore x \leq 2$
D $\Rightarrow x+4 \leq 8-3x$
 $4x \leq 4$
 $\therefore x \leq 1$

STEP 2

기본연산 집중연습 | 10~14

p. 130 ~ p. 131

- 1 $\times$ 2 $\bigcirc$
3 $\bigcirc$ 4 $\times$
5 $\bigcirc$ 6 $\times$
7 $x < 2$ 8 $x \geq 2$
9 $x \leq 3$ 10 $x > -8$
11 $x > -6$ 12 $x \geq -2$
13 $x \geq -2$ 14 $x < -\frac{1}{2}$
15 $x < 7$ 16 $x \leq -1$
17 A- $\bigcirc$, B- $\bigcirc$, C- $\bigcirc$, D- $\bigcirc$, E- $\bigcirc$

- 3 $5x-4 \leq 6-x$ 에서 $6x-10 \leq 0$ (일차부등식)
4 $x+5 < -1+x$ 에서 $6 < 0$ (일차부등식이 아니다.)

STEP 1

15 괄호가 있는 일차부등식의 풀이 p. 132 ~ p. 133

- 1 $6, 2x, 6, -5$ 2 $x \geq 9$
3 $x < -7$ 4 $x < 4$
5 $x > -4$ 6 $x \leq -5$
7 $x \leq 2$ 8 $x \geq 3$
9 $x < 9$ 10 $x \geq -1$
11 $x \geq \frac{6}{7}$ 12 $x < -3$
13 $x > 2$ 14 $x \leq 4$
15 $x < -6$ 16 $x \leq \frac{9}{4}$
17 $x < -2$ 18 $x \leq -3$
19 $x \leq -3$ 20 $x > \frac{18}{5}$

$$\begin{aligned} 2 \quad & 2x+6 \leq 4(x-3) \\ & 2x+6 \leq 4x-12 \\ & -2x \leq -18 \\ & \therefore x \geq 9 \end{aligned}$$

$$\begin{aligned} 3 \quad & 2(x-1) > 3x+5 \\ & 2x-2 > 3x+5 \\ & -x > 7 \\ & \therefore x < -7 \end{aligned}$$

$$\begin{aligned} 4 \quad & 3(x-3) < -x+7 \\ & 3x-9 < -x+7 \\ & 4x < 16 \\ & \therefore x < 4 \end{aligned}$$

$$\begin{aligned} 5 \quad & 2(x-3) < 5x+6 \\ & 2x-6 < 5x+6 \\ & -3x < 12 \\ & \therefore x > -4 \end{aligned}$$

$$\begin{aligned} 6 \quad & 1-3x \geq -2(x-3) \\ & 1-3x \geq -2x+6 \\ & -x \geq 5 \\ & \therefore x \leq -5 \end{aligned}$$

$$\begin{aligned} 7 \quad & 5-(3-x) \geq 2x \\ & 5-3+x \geq 2x \\ & -x \geq -2 \\ & \therefore x \leq 2 \end{aligned}$$

$$\begin{aligned} 8 \quad & 2x-(5x-4) \leq -5 \\ & 2x-5x+4 \leq -5 \\ & -3x \leq -9 \\ & \therefore x \geq 3 \end{aligned}$$

$$\begin{aligned} 9 \quad & 3(x-1) < 2(x+3) \\ & 3x-3 < 2x+6 \\ & \therefore x < 9 \end{aligned}$$

$$\begin{aligned} 10 \quad & 5(x+1) \geq -2(x+1) \\ & 5x+5 \geq -2x-2 \\ & 7x \geq -7 \\ & \therefore x \geq -1 \end{aligned}$$

$$\begin{aligned} 11 \quad & 4(1-2x) \leq -(x+2) \\ & 4-8x \leq -x-2 \\ & -7x \leq -6 \\ & \therefore x \geq \frac{6}{7} \end{aligned}$$

$$\begin{aligned} 12 \quad & -2(x+4) > 2(x+2) \\ & -2x-8 > 2x+4 \\ & -4x > 12 \\ & \therefore x < -3 \end{aligned}$$

$$\begin{aligned} 13 \quad & 3(4-x) < 2(x+1) \\ & 12-3x < 2x+2 \\ & -5x < -10 \\ & \therefore x > 2 \end{aligned}$$

$$\begin{aligned} 14 \quad & 3(x-2) \leq 6(5-x) \\ & 3x-6 \leq 30-6x \\ & 9x \leq 36 \\ & \therefore x \leq 4 \end{aligned}$$

$$\begin{aligned} 15 \quad & 2(3-2x) > 6(x+11) \\ & 6-4x > 6x+66 \\ & -10x > 60 \\ & \therefore x < -6 \end{aligned}$$

$$\begin{aligned} 16 \quad & -(x-3) \geq 3(x-2) \\ & -x+3 \geq 3x-6 \\ & -4x \geq -9 \\ & \therefore x \leq \frac{9}{4} \end{aligned}$$

$$\begin{aligned} 17 \quad & 2(x+5) > 3(2x+4)+6 \\ & 2x+10 > 6x+12+6 \\ & -4x > 8 \\ & \therefore x < -2 \end{aligned}$$

$$\begin{aligned} 18 \quad & 5-(4+3x) \geq -2(x-2) \\ & 5-4-3x \geq -2x+4 \\ & -x \geq 3 \\ & \therefore x \leq -3 \end{aligned}$$

$$\begin{aligned} 19 \quad & x-3(x-3) \leq 3(2-x) \\ & x-3x+9 \leq 6-3x \\ & \therefore x \leq -3 \end{aligned}$$

$$\begin{aligned} 20 \quad & 3(x-3)+2 > 4-(2x-7) \\ & 3x-9+2 > 4-2x+7 \\ & 5x > 18 \\ & \therefore x > \frac{18}{5} \end{aligned}$$

16 계수가 소수인 일차부등식의 풀이 p. 134 ~ p. 136

1 $x, x, 2x, 4$ 2 $x \geq -4$

3 $x \leq -6$ 4 $x < 5$

5 $x \leq \frac{32}{3}$ 6 $x > \frac{3}{5}$

7 $x \leq -11$ 8 $x < -8$

9 $10, 15, 10, -25, x < \frac{5}{3}$ 10 $x \leq 4$

11 $x \geq 6$ 12 $x > -5$

13 $x < 10$ 14 $x \leq 2$

15 $3, 12, 12, -24, x > 8$ 16 $x \geq 2$

17 $x < -2$ 18 $x \geq -1$

19 $x \leq 2$ 20 $x \geq 1$

21 $x < -\frac{13}{6}$ 22 $x \geq 2$

23 $0.21, 21, 21, \frac{3}{10}$ 24 $x < -\frac{3}{20}$

25 $x \leq 2$ 26 $x \geq \frac{16}{3}$

27 $x \geq -5$ 28 $x \leq -1$

2 $0.5x \geq 0.2x - 1.2$ 양변에 10을 곱한다.
 $5x \geq 2x - 12$
 $3x \geq -12$
 $\therefore x \geq -4$

3 $0.6x \leq 0.4x - 1.2$ 양변에 10을 곱한다.
 $6x \leq 4x - 12$
 $2x \leq -12$
 $\therefore x \leq -6$

4 $-0.2x + 0.2 > -0.1x - 0.3$ 양변에 10을 곱한다.
 $-2x + 2 > -x - 3$
 $-x > -5$
 $\therefore x < 5$

5 $0.5x + 2 \geq 0.8x - 1.2$ 양변에 10을 곱한다.
 $5x + 20 \geq 8x - 12$
 $-3x \geq -32$
 $\therefore x \leq \frac{32}{3}$

6 $0.5x + 0.2 < x - 0.1$ 양변에 10을 곱한다.
 $5x + 2 < 10x - 1$
 $-5x < -3$
 $\therefore x > \frac{3}{5}$

7 $0.8x + 1.5 \leq 0.3x - 4$ 양변에 10을 곱한다.
 $8x + 15 \leq 3x - 40$
 $5x \leq -55$
 $\therefore x \leq -11$

8 $0.1x - 0.6 > 1 + 0.3x$ 양변에 10을 곱한다.
 $x - 6 > 10 + 3x$
 $-2x > 16$
 $\therefore x < -8$

10 $0.03x - 0.1 \leq 0.02$ 양변에 100을 곱한다.
 $3x - 10 \leq 2$
 $3x \leq 12$
 $\therefore x \leq 4$

11 $0.05x \geq 1.5 - 0.2x$ 양변에 100을 곱한다.
 $5x \geq 150 - 20x$
 $25x \geq 150$
 $\therefore x \geq 6$

12 $0.01x < 0.1x + 0.45$ 양변에 100을 곱한다.
 $x < 10x + 45$
 $-9x < 45$
 $\therefore x > -5$

13 $0.04x - 0.3 < -0.01x + 0.2$ 양변에 100을 곱한다.
 $4x - 30 < -x + 20$
 $5x < 50$
 $\therefore x < 10$

14 $0.36x - 0.14 \leq 0.24x + 0.1$ 양변에 100을 곱한다.
 $36x - 14 \leq 24x + 10$
 $12x \leq 24$
 $\therefore x \leq 2$

16 $0.9x \geq 0.2(x + 7)$ 양변에 10을 곱한다.
 $9x \geq 2(x + 7)$
 $9x \geq 2x + 14$
 $7x \geq 14$
 $\therefore x \geq 2$

17 $0.2(3x - 4) > 1.5x + 1$ 양변에 10을 곱한다.
 $2(3x - 4) > 15x + 10$
 $6x - 8 > 15x + 10$
 $-9x > 18$
 $\therefore x < -2$

18 $0.3(2x - 3) \leq 3.5x + 2$ 양변에 10을 곱한다.
 $3(2x - 3) \leq 35x + 20$
 $6x - 9 \leq 35x + 20$
 $-29x \leq 29$
 $\therefore x \geq -1$

$$\begin{aligned}
 19 \quad & 0.3x - 0.2(x-4) \leq 1 \\
 & 3x - 2(x-4) \leq 10 \quad \left\{ \begin{array}{l} \text{양변에 10을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & 3x - 2x + 8 \leq 10 \\
 & \therefore x \leq 2
 \end{aligned}$$

$$\begin{aligned}
 20 \quad & 0.3(2x+1) - 0.5 \geq 0.4x \\
 & 3(2x+1) - 5 \geq 4x \quad \left\{ \begin{array}{l} \text{양변에 10을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & 6x + 3 - 5 \geq 4x \\
 & 2x \geq 2 \\
 & \therefore x \geq 1
 \end{aligned}$$

$$\begin{aligned}
 21 \quad & 0.3(2x-1) > 1.2x + 1 \\
 & 3(2x-1) > 12x + 10 \quad \left\{ \begin{array}{l} \text{양변에 10을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & 6x - 3 > 12x + 10 \\
 & -6x > 13 \\
 & \therefore x < -\frac{13}{6}
 \end{aligned}$$

$$\begin{aligned}
 22 \quad & 0.2(3-x) + 0.8 \leq 0.5x \\
 & 2(3-x) + 8 \leq 5x \quad \left\{ \begin{array}{l} \text{양변에 10을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & 6 - 2x + 8 \leq 5x \\
 & -7x \leq -14 \\
 & \therefore x \geq 2
 \end{aligned}$$

$$\begin{aligned}
 24 \quad & x < 0.2(x-0.6) \\
 & x < 0.2x - 0.12 \quad \left\{ \begin{array}{l} \text{괄호를 뗀다.} \\ \text{양변에 100을 곱한다.} \end{array} \right. \\
 & 100x < 20x - 12 \\
 & 80x < -12 \\
 & \therefore x < -\frac{3}{20}
 \end{aligned}$$

$$\begin{aligned}
 25 \quad & 0.1(x-0.3) \leq 0.17 \\
 & 0.1x - 0.03 \leq 0.17 \quad \left\{ \begin{array}{l} \text{괄호를 뗀다.} \\ \text{양변에 100을 곱한다.} \end{array} \right. \\
 & 10x - 3 \leq 17 \\
 & 10x \leq 20 \\
 & \therefore x \leq 2
 \end{aligned}$$

$$\begin{aligned}
 26 \quad & 0.3(0.1x-0.2) \geq 0.1 \\
 & 0.03x - 0.06 \geq 0.1 \quad \left\{ \begin{array}{l} \text{괄호를 뗀다.} \\ \text{양변에 100을 곱한다.} \end{array} \right. \\
 & 3x - 6 \geq 10 \\
 & 3x \geq 16 \\
 & \therefore x \geq \frac{16}{3}
 \end{aligned}$$

$$\begin{aligned}
 27 \quad & 0.2(0.5-0.7x) \leq 0.8 \\
 & 0.1 - 0.14x \leq 0.8 \quad \left\{ \begin{array}{l} \text{괄호를 뗀다.} \\ \text{양변에 100을 곱한다.} \end{array} \right. \\
 & 10 - 14x \leq 80 \\
 & -14x \leq 70 \\
 & \therefore x \geq -5
 \end{aligned}$$

$$\begin{aligned}
 28 \quad & -3(0.2x-0.3) \geq 0.5(2-x) \\
 & -0.6x + 0.9 \geq 1 - 0.5x \quad \left\{ \begin{array}{l} \text{괄호를 뗀다.} \\ \text{양변에 10을 곱한다.} \end{array} \right. \\
 & -6x + 9 \geq 10 - 5x \\
 & -x \geq 1 \\
 & \therefore x \leq -1
 \end{aligned}$$

17 계수가 분수인 일차부등식의 풀이 p. 137 ~ p. 139

1	20, 20, 5, 20, 4	2	$x < 3$
3	$x \geq -2$	4	$x \geq 6$
5	$x < -20$	6	$x \geq -2$
7	$x \leq 24$	8	$x < 1$
9	$x \geq -3$	10	$x < 1$
11	$x < 7$	12	$x < -6$
13	$x \leq -\frac{1}{2}$	14	$x \geq \frac{10}{7}$
15	2, 8, 8, 3, $x \geq -1$	16	$x > -12$
17	$x > -11$	18	$x \geq -2$
19	$x \leq 2$	20	$x < -4$
21	$x \geq 4$	22	$x < -2$
23	$x > -3$	24	$x > 3$
25	$x > 19$	26	$x \geq 5$
27	$x \leq 9$	28	$x < -3$

$$\begin{aligned}
 2 \quad & \frac{x}{2} < \frac{x}{6} + 1 \\
 & 3x < x + 6 \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 6을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & 2x < 6 \\
 & \therefore x < 3
 \end{aligned}$$

$$\begin{aligned}
 3 \quad & \frac{1}{5}x \leq \frac{1}{2}x + \frac{3}{5} \\
 & 2x \leq 5x + 6 \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 10을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & -3x \leq 6 \\
 & \therefore x \geq -2
 \end{aligned}$$

$$\begin{aligned}
 4 \quad & \frac{1}{2}x \geq \frac{1}{3}x + 1 \\
 & 3x \geq 2x + 6 \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 6을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & \therefore x \geq 6
 \end{aligned}$$

$$\begin{aligned}
 5 \quad & \frac{1}{4}x - 1 > \frac{2}{5}x + 2 \\
 & 5x - 20 > 8x + 40 \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 20을 곱한다.} \\ \text{괄호를 뗀다.} \end{array} \right. \\
 & -3x > 60 \\
 & \therefore x < -20
 \end{aligned}$$

$$\begin{aligned}
 6 \quad & -\frac{3}{4}x - 1 \leq \frac{1}{2}x + \frac{3}{2} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 4를 곱한다.} \\ -3x - 4 \leq 2x + 6 \\ -5x \leq 10 \\ \therefore x \geq -2 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 7 \quad & \frac{x}{3} + 1 \geq \frac{2}{5}x - \frac{3}{5} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 15를 곱한다.} \\ 5x + 15 \geq 6x - 9 \\ -x \geq -24 \\ \therefore x \leq 24 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 8 \quad & \frac{2}{5}x + \frac{7}{10} < \frac{1}{10}x + 1 \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 10을 곱한다.} \\ 4x + 7 < x + 10 \\ 3x < 3 \\ \therefore x < 1 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 9 \quad & \frac{x}{3} \leq \frac{5}{6}x + \frac{3}{2} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 6을 곱한다.} \\ 2x \leq 5x + 9 \\ -3x \leq 9 \\ \therefore x \geq -3 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 10 \quad & \frac{x}{5} + \frac{1}{3} > \frac{8}{15}x \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 15를 곱한다.} \\ 3x + 5 > 8x \\ -5x > -5 \\ \therefore x < 1 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 11 \quad & \frac{3}{5}x < \frac{x}{2} + \frac{7}{10} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 10을 곱한다.} \\ 6x < 5x + 7 \\ \therefore x < 7 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 12 \quad & \frac{2}{3}x - \frac{1}{2} > \frac{3}{4}x \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 12를 곱한다.} \\ 8x - 6 > 9x \\ -x > 6 \\ \therefore x < -6 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 13 \quad & \frac{x}{3} \geq \frac{5}{6}x + \frac{1}{4} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 12를 곱한다.} \\ 4x \geq 10x + 3 \\ -6x \geq 3 \\ \therefore x \leq -\frac{1}{2} \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 14 \quad & \frac{3}{4}x \geq \frac{2}{5}x + \frac{1}{2} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 20을 곱한다.} \\ 15x \geq 8x + 10 \\ 7x \geq 10 \\ \therefore x \geq \frac{10}{7} \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 16 \quad & \frac{x+3}{6} < \frac{x+6}{4} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 12를 곱한다.} \\ 2(x+3) < 3(x+6) \\ 2x+6 < 3x+18 \\ -x < 12 \\ \therefore x > -12 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 17 \quad & \frac{2x+1}{3} > \frac{x-3}{2} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 6을 곱한다.} \\ 2(2x+1) > 3(x-3) \\ 4x+2 > 3x-9 \\ \therefore x > -11 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 18 \quad & \frac{x-2}{4} - \frac{2x-1}{5} \leq 0 \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 20을 곱한다.} \\ 5(x-2) - 4(2x-1) \leq 0 \\ 5x-10-8x+4 \leq 0 \\ -3x \leq 6 \\ \therefore x \geq -2 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 19 \quad & \frac{x-2}{4} \leq \frac{x}{6} - \frac{1}{3} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 12를 곱한다.} \\ 3(x-2) \leq 2x-4 \\ 3x-6 \leq 2x-4 \\ \therefore x \leq 2 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 20 \quad & \frac{1-2x}{3} > 2 - \frac{x}{4} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 12를 곱한다.} \\ 4(1-2x) > 24-3x \\ 4-8x > 24-3x \\ -5x > 20 \\ \therefore x < -4 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 21 \quad & \frac{1}{3}x - \frac{5-x}{2} \geq \frac{5}{6} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 6을 곱한다.} \\ 2x-3(5-x) \geq 5 \\ 2x-15+3x \geq 5 \\ 5x \geq 20 \\ \therefore x \geq 4 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 22 \quad & \frac{1}{2}x - \frac{x-2}{4} > 2+x \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 4를 곱한다.} \\ 2x-(x-2) > 8+4x \\ 2x-x+2 > 8+4x \\ -3x > 6 \\ \therefore x < -2 \end{array} \right.
 \end{aligned}$$

$$\begin{aligned}
 23 \quad & \frac{x-3}{4} - \frac{3x-1}{5} < \frac{1}{2} \quad \left\{ \begin{array}{l} \text{양변에 분모의 최소공배수 20을 곱한다.} \\ 5(x-3) - 4(3x-1) < 10 \\ 5x-15-12x+4 < 10 \\ -7x < 21 \\ \therefore x > -3 \end{array} \right.
 \end{aligned}$$

24 $3 - \frac{x-3}{4} < \frac{x+3}{2}$ 양변에 분모의 최소공배수 4를 곱한다.
 $12 - (x-3) < 2(x+3)$
 $12 - x + 3 < 2x + 6$
 $-3x < -9$
 $\therefore x > 3$

25 $\frac{3x-2}{5} > 2 + \frac{x-1}{2}$ 양변에 분모의 최소공배수 10을 곱한다.
 $2(3x-2) > 20 + 5(x-1)$
 $6x - 4 > 20 + 5x - 5$
 $\therefore x > 19$

26 $\frac{x-2}{3} + 2 \geq \frac{7+x}{4}$ 양변에 분모의 최소공배수 12를 곱한다.
 $4(x-2) + 24 \geq 3(7+x)$
 $4x - 8 + 24 \geq 21 + 3x$
 $\therefore x \geq 5$

27 $\frac{x-1}{3} - \frac{x+1}{4} \leq \frac{1}{6}$ 양변에 분모의 최소공배수 12를 곱한다.
 $4(x-1) - 3(x+1) \leq 2$
 $4x - 4 - 3x - 3 \leq 2$
 $\therefore x \leq 9$

28 $\frac{3x+5}{4} < \frac{x-1}{2} + 1$ 양변에 분모의 최소공배수 4를 곱한다.
 $3x + 5 < 2(x-1) + 4$
 $3x + 5 < 2x - 2 + 4$
 $\therefore x < -3$

2 $\frac{1}{5}x + 0.4 > x - 2$
 $\frac{1}{5}x + \frac{2}{5} > x - 2$ 양변에 5를 곱한다.
 $x + 2 > 5x - 10$
 $-4x > -12$
 $\therefore x < 3$

3 $\frac{1}{2}x + 0.3 > x - \frac{1}{5}$
 $\frac{1}{2}x + \frac{3}{10} > x - \frac{1}{5}$ 양변에 10을 곱한다.
 $5x + 3 > 10x - 2$
 $-5x > -5$
 $\therefore x < 1$

4 $\frac{x}{3} + 0.5 \leq x - \frac{5}{6}$
 $\frac{x}{3} + \frac{1}{2} \leq x - \frac{5}{6}$ 양변에 6을 곱한다.
 $2x + 3 \leq 6x - 5$
 $-4x \leq -8$
 $\therefore x \geq 2$

5 $\frac{1}{4}x + 0.6 \geq 0.2x - \frac{1}{5}$
 $\frac{1}{4}x + \frac{3}{5} \geq \frac{1}{5}x - \frac{1}{5}$ 양변에 20을 곱한다.
 $5x + 12 \geq 4x - 4$
 $\therefore x \geq -16$

6 $\frac{1}{2} + 1.5x < \frac{5}{4}x + 0.2$
 $\frac{1}{2} + \frac{3}{2}x < \frac{5}{4}x + \frac{1}{5}$ 양변에 20을 곱한다.
 $10 + 30x < 25x + 4$
 $5x < -6$
 $\therefore x < -\frac{6}{5}$

18 복잡한 일차부등식의 풀이 p. 140 ~ p. 141

1 $\frac{1}{5}, 5, 5, -6, x \leq 2$	2 $x < 3$
3 $x < 1$	4 $x \geq 2$
5 $x \geq -16$	6 $x < -\frac{6}{5}$
7 $\frac{1}{2}, 10, 3x, -2, x > -7$	8 $x \geq 3$
9 $x > -\frac{1}{5}$	10 $x \leq 1$
11 $x \geq 5$	12 $x < -4$
13 $x \leq 0$	14 $x > -\frac{1}{3}$
15 $x > 2$	16 $x \geq -\frac{7}{8}$

8 $\frac{1}{5}(3x+2) \geq 0.4x + 1$
 $\frac{1}{5}(3x+2) \geq \frac{2}{5}x + 1$ 양변에 5를 곱한다.
 $3x + 2 \geq 2x + 5$
 $\therefore x \geq 3$

9 $\frac{6}{5}x + 1.2 > 0.2(x+5)$
 $\frac{6}{5}x + \frac{6}{5} > \frac{1}{5}(x+5)$ 양변에 5를 곱한다.
 $6x + 6 > x + 5$
 $5x > -1$
 $\therefore x > -\frac{1}{5}$

$$\begin{aligned}
 10 \quad & 0.3(2x+1) - \frac{1}{2} \leq 0.4x \\
 & \frac{3}{10}(2x+1) - \frac{1}{2} \leq \frac{2}{5}x \quad \left[\text{양변에 10을 곱한다.} \right] \\
 & 3(2x+1) - 5 \leq 4x \\
 & 6x+3-5 \leq 4x \\
 & 2x \leq 2 \\
 & \therefore x \leq 1
 \end{aligned}$$

$$\begin{aligned}
 11 \quad & 0.4 - \frac{1}{5}x \leq 0.2(x-8) \\
 & \frac{2}{5} - \frac{1}{5}x \leq \frac{1}{5}(x-8) \quad \left[\text{양변에 5를 곱한다.} \right] \\
 & 2-x \leq x-8 \\
 & -2x \leq -10 \\
 & \therefore x \geq 5
 \end{aligned}$$

$$\begin{aligned}
 12 \quad & 0.7(2x+3) > \frac{8}{5}x + 2.9 \\
 & \frac{7}{10}(2x+3) > \frac{8}{5}x + \frac{29}{10} \quad \left[\text{양변에 10을 곱한다.} \right] \\
 & 7(2x+3) > 16x+29 \\
 & 14x+21 > 16x+29 \\
 & -2x > 8 \\
 & \therefore x < -4
 \end{aligned}$$

$$\begin{aligned}
 13 \quad & -\frac{x-2}{2} + 2 \geq 0.5x + 3 \\
 & -\frac{x-2}{2} + 2 \geq \frac{1}{2}x + 3 \quad \left[\text{양변에 2를 곱한다.} \right] \\
 & -(x-2) + 4 \geq x+6 \\
 & -x+2+4 \geq x+6 \\
 & -2x \geq 0 \\
 & \therefore x \leq 0
 \end{aligned}$$

$$\begin{aligned}
 14 \quad & \frac{2x-1}{3} - \frac{x+2}{6} < x-0.5 \\
 & \frac{2x-1}{3} - \frac{x+2}{6} < x - \frac{1}{2} \quad \left[\text{양변에 6을 곱한다.} \right] \\
 & 2(2x-1) - (x+2) < 6x-3 \\
 & 4x-2-x-2 < 6x-3 \\
 & -3x < 1 \\
 & \therefore x > -\frac{1}{3}
 \end{aligned}$$

$$\begin{aligned}
 15 \quad & \frac{2+3x}{5} < 0.2(7x-6) \\
 & \frac{2+3x}{5} < \frac{1}{5}(7x-6) \quad \left[\text{양변에 5를 곱한다.} \right] \\
 & 2+3x < 7x-6 \\
 & -4x < -8 \\
 & \therefore x > 2
 \end{aligned}$$

$$\begin{aligned}
 16 \quad & \frac{1-2x}{4} \leq 0.5(3x+4) \\
 & \frac{1-2x}{4} \leq \frac{1}{2}(3x+4) \quad \left[\text{양변에 4를 곱한다.} \right] \\
 & 1-2x \leq 2(3x+4) \\
 & 1-2x \leq 6x+8 \\
 & -8x \leq 7 \\
 & \therefore x \geq -\frac{7}{8}
 \end{aligned}$$

STEP 2

기본연산 집중연습 | 15~18

p. 142 ~ p. 143

1 $x < -1$	2 $x \leq 4$
3 $x > -8$	4 $x \geq 1$
5 $x \leq -7$	6 $x < 4$
7 $x < -4$	8 $x \geq 4$
9 $x < -18$	10 $x \leq 2$
11 $x \leq 5$	12 $x > 1$
13 $x \leq -4$	14 $x \leq 5$
15 ㉠, $x < -\frac{13}{2}$	16 ㉠, $x > -10$
17 ㉡, $x \leq -1$	18 ㉠, $x \geq 1$

$$\begin{aligned}
 1 \quad & 4x < 3(x-1) + 2 \\
 & 4x < 3x-3+2 \\
 & \therefore x < -1
 \end{aligned}$$

$$\begin{aligned}
 2 \quad & 5-5(x-4) \geq 3x-7 \\
 & 5-5x+20 \geq 3x-7 \\
 & -8x \geq -32 \\
 & \therefore x \leq 4
 \end{aligned}$$

$$\begin{aligned}
 3 \quad & 4(x+1) > 2(x-6) \\
 & 4x+4 > 2x-12 \\
 & 2x > -16 \\
 & \therefore x > -8
 \end{aligned}$$

$$\begin{aligned}
4 \quad & 8-2(x+3) \leq 3(x-1) \\
& 8-2x-6 \leq 3x-3 \\
& -5x \leq -5 \\
& \therefore x \geq 1
\end{aligned}$$

$$\begin{aligned}
5 \quad & 0,2x-0,3 \geq 0,5x+1,8 \\
& 2x-3 \geq 5x+18 \\
& -3x \geq 21 \\
& \therefore x \leq -7
\end{aligned}$$

$$\begin{aligned}
6 \quad & 0,27x-0,3 < -0,14+0,23x \\
& 27x-30 < -14+23x \\
& 4x < 16 \\
& \therefore x < 4
\end{aligned}$$

$$\begin{aligned}
7 \quad & 0,2(x+3) > 1+0,3x \\
& 2(x+3) > 10+3x \\
& 2x+6 > 10+3x \\
& -x > 4 \\
& \therefore x < -4
\end{aligned}$$

$$\begin{aligned}
8 \quad & 3(1-0,2x) \leq 0,1x+0,2 \\
& 3-0,6x \leq 0,1x+0,2 \\
& 30-6x \leq x+2 \\
& -7x \leq -28 \\
& \therefore x \geq 4
\end{aligned}$$

$$\begin{aligned}
9 \quad & \frac{2}{3}x - \frac{3}{2} > \frac{3}{4}x \\
& 8x-18 > 9x \\
& -x > 18 \\
& \therefore x < -18
\end{aligned}$$

$$\begin{aligned}
10 \quad & x - \frac{1}{2} \leq \frac{x}{3} + \frac{5}{6} \\
& 6x-3 \leq 2x+5 \\
& 4x \leq 8 \\
& \therefore x \leq 2
\end{aligned}$$

$$\begin{aligned}
11 \quad & \frac{x}{5} - 1 \geq \frac{x-5}{3} \\
& 3x-15 \geq 5(x-5) \\
& 3x-15 \geq 5x-25 \\
& -2x \geq -10 \\
& \therefore x \leq 5
\end{aligned}$$

$$\begin{aligned}
12 \quad & 1 - \frac{2x-1}{2} < \frac{x+1}{4} \\
& 4-2(2x-1) < x+1 \\
& 4-4x+2 < x+1 \\
& -5x < -5 \\
& \therefore x > 1
\end{aligned}$$

$$\begin{aligned}
13 \quad & \frac{1}{2}x + 0,3 \geq \frac{4}{5}x + 1,5 \\
& \frac{1}{2}x + \frac{3}{10} \geq \frac{4}{5}x + \frac{3}{2} \\
& 5x+3 \geq 8x+15 \\
& -3x \geq 12 \\
& \therefore x \leq -4
\end{aligned}$$

$$\begin{aligned}
14 \quad & 0,5x-1 \leq \frac{1}{6}(x+4) \\
& \frac{1}{2}x-1 \leq \frac{1}{6}(x+4) \\
& 3x-6 \leq x+4 \\
& 2x \leq 10 \\
& \therefore x \leq 5
\end{aligned}$$

$$\begin{aligned}
15 \quad & 4(x+1) - 2(x-6) < 3 \\
& 4x+4-2x+12 < 3 \\
& 4x-2x < 3-4-12 \\
& 2x < -13 \\
& \therefore x < -\frac{13}{2}
\end{aligned}$$

$$\begin{aligned}
16 \quad & 0,2x-1 < 0,3x \\
& 2x-10 < 3x \\
& 2x-3x < 10 \\
& -x < 10 \\
& \therefore x > -10
\end{aligned}$$

$$\begin{aligned}
17 \quad & \frac{1}{3}x - \frac{1}{6} \geq \frac{x}{2} \\
& 2x-1 \geq 3x \\
& 2x-3x \geq 1 \\
& -x \geq 1 \\
& \therefore x \leq -1
\end{aligned}$$

$$\begin{aligned}
18 \quad & \frac{2x+1}{3} - \frac{x-1}{2} \geq 1 \\
& 2(2x+1) - 3(x-1) \geq 6 \\
& 4x+2-3x+3 \geq 6 \\
& 4x-3x \geq 6-2-3 \\
& \therefore x \geq 1
\end{aligned}$$

19 일차부등식의 활용

p. 144 ~ p. 148

1 (1) $3x >$ (2) $3x + 15 > 72$ (3) $x > 19$ (4) 20

2 6 3 27, 28, 29

4 (1) $\leq$ (2) $3000 + 800x \leq 10000$ (3) $x \leq \frac{70}{8}$ (4) 8자루

5 11개 6 10송이

7 (1)

	집 근처 매장	할인 매장
음료수 가격(원)	800	500
교통비(원)	0	1800
총 비용(원)	$800x$	$500x + 1800$

(2) $800x > 500x + 1800$ (3) $x > 6$ (4) 7칸

8 6권 9 25명

10 (1) $x - 10$ (2) $2\{(x - 10) + x\} \geq 140$ (3) $x \geq 40$ (4) 40 cm

11 13 cm 12 9 cm

13 (1)

	올라갈 때	내려올 때
거리	x km	x km
속력	시속 3 km	시속 5 km
시간	$\frac{x}{3}$ 시간	$\frac{x}{5}$ 시간

(2) $\leq, \frac{x}{3} + \frac{x}{5} \leq 3$ (3) $x \leq \frac{45}{8}$ (4) $\frac{45}{8}$ km

14 1 km 15 $\frac{9}{8}$ km

1 (3) $3x + 15 > 72$ 에서 $3x > 57 \quad \therefore x > 19$

(4) x 는 정수이므로 조건을 만족하는 가장 작은 수는 20이다.2 어떤 정수를 x 라 하면

$4(x + 2) \leq 32, x + 2 \leq 8 \quad \therefore x \leq 6$

따라서 조건을 만족하는 가장 큰 수는 6이다.

3 연속하는 세 자연수를 $x - 1, x, x + 1$ 이라 하면

$(x - 1) + x + (x + 1) < 87, 3x < 87 \quad \therefore x < 29$

따라서 조건을 만족하는 가장 큰 세 자연수는 27, 28, 29이다.

4 (3) $3000 + 800x \leq 10000$ 에서 $800x \leq 7000$

$\therefore x \leq \frac{70}{8}$

(4) 볼펜의 수는 자연수이므로 최대 8자루까지 살 수 있다.

5 상자의 개수를 x 개라 하면

$50 + 40x \leq 500, 40x \leq 450 \quad \therefore x \leq \frac{45}{4}$

따라서 한 번에 상자를 최대 11개까지 운반할 수 있다.

6 빨간 장미를 x 송이라 하면 노란 장미는 $(20 - x)$ 송이이므로

$1500x + 1000(20 - x) \leq 25000$

$1500x + 20000 - 1000x \leq 25000$

$500x \leq 5000 \quad \therefore x \leq 10$

따라서 빨간 장미는 최대 10송이까지 살 수 있다.

7 (3) $800x > 500x + 1800$ 에서 $300x > 1800$

$\therefore x > 6$

(4) 음료수의 수는 자연수이므로 7칸 이상 사는 경우에 할인 매장에서 사는 것이 더 유리하다.

8 책을 x 권 산다고 하면

$5000x > 4500x + 2500$

$500x > 2500 \quad \therefore x > 5$

따라서 6권 이상 사는 경우에 인터넷 서점에서 사는 것이 더 유리하다.

9 입장하는 사람 수를 x 명이라 하면

$2000x > \left(2000 \times \frac{80}{100}\right) \times 30$

$2000x > 48000 \quad \therefore x > 24$

따라서 25명 이상일 때, 30명의 단체 입장권을 사는 것이 더 유리하다.

10 (3) $2\{(x - 10) + x\} \geq 140$ 에서 $4x - 20 \geq 140$

$4x \geq 160 \quad \therefore x \geq 40$

(4) 세로의 길이는 40 cm 이상이어야 한다.

11 삼각형의 밑변의 길이를 x cm라 하면

$\frac{1}{2} \times x \times 12 \leq 78, 6x \leq 78 \quad \therefore x \leq 13$

따라서 밑변의 길이는 13 cm 이하이어야 한다.

12 사다리꼴의 아랫변의 길이를 x cm라 하면

$\frac{1}{2} \times (7 + x) \times 8 \geq 64$

$4x + 28 \geq 64, 4x \geq 36 \quad \therefore x \geq 9$

따라서 아랫변의 길이는 9 cm 이상이어야 한다.

13 (3) $\frac{x}{3} + \frac{x}{5} \leq 3$ 에서 $5x + 3x \leq 45$

$8x \leq 45 \quad \therefore x \leq \frac{45}{8}$

(4) 최대 $\frac{45}{8}$ km까지 올라갈 수 있다.14 걸어간 거리를 x km라 하면 달려간 거리는 $(5 - x)$ km
이므로

$\frac{x}{3} + \frac{5 - x}{6} \leq 1, 2x + 5 - x \leq 6 \quad \therefore x \leq 1$

따라서 걸어간 거리는 1 km 이하이다.

- 15 역에서 상점까지의 거리를 x km라 하면

$$\frac{x}{3} + \frac{15}{60} + \frac{x}{3} \leq 1, 4x + 3 + 4x \leq 12$$

$$8x \leq 9 \quad \therefore x \leq \frac{9}{8}$$

따라서 $\frac{9}{8}$ km 이내에 있는 상점을 이용할 수 있다.

- 5 올라간 거리를 x km라 하면

$$\frac{x}{2} + \frac{x}{3} \leq 5, 3x + 2x \leq 30, 5x \leq 30 \quad \therefore x \leq 6$$

따라서 최대 6 km까지 올라갈 수 있다.

- 6 뛰어간 거리를 x km라 하면 걸어간 거리는 $(8-x)$ km
이므로

$$\frac{8-x}{4} + \frac{x}{6} \leq 1 \frac{20}{60}$$

$$3(8-x) + 2x \leq 16, 24 - 3x + 2x \leq 16$$

$$-x \leq -8 \quad \therefore x \geq 8$$

따라서 지호가 뛰어간 거리는 8 km 이상이다.

STEP 2

기본연산 집중연습 | 19

p. 149

- | | |
|--------------|---------|
| 1 18, 20, 22 | 2 10장 |
| 3 16권 | 4 23 cm |
| 5 6 km | 6 8 km |

- 1 연속하는 세 짝수를 $x-2, x, x+2$ 라 하면
 $(x-2) + x + (x+2) > 54$
 $3x > 54 \quad \therefore x > 18$
 따라서 조건을 만족하는 가장 작은 세 짝수는 18, 20, 22이다.
- 2 엽서를 x 장이라 하면 우표는 $(100-x)$ 장이므로
 $600x + 300(100-x) \leq 33000$
 $600x + 30000 - 300x \leq 33000$
 $300x \leq 3000 \quad \therefore x \leq 10$
 따라서 엽서는 최대 10장까지 살 수 있다.
- 3 공책을 x 권 산다고 하면
 $600x > 500x + 1500$
 $100x > 1500 \quad \therefore x > 15$
 따라서 공책을 16권 이상 사는 경우에 할인 매장에서 사는 것이 더 유리하다.
- 4 세로의 길이를 x cm라 하면 가로 길이는 $(x+4)$ cm
 이므로
 $2\{(x+4) + x\} \leq 100$
 $4x + 8 \leq 100, 4x \leq 92 \quad \therefore x \leq 23$
 따라서 세로의 길이는 23 cm 이하이어야 한다.

STEP 3

기본연산 테스트

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|---|
| 1 (1) ○ (2) × (3) × (4) ○ (5) × (6) ○ |
| 2 (1) $2x \geq 5 + x$ (2) $7a < 5000$ (3) $x + 16 \leq 3x$
(4) $x + 15 > 170$ (5) $9x \geq 20$ |
| 3 (1) ○ (2) ○ (3) × (4) × (5) ○ |
| 4 (1) > (2) > (3) < (4) < (5) < |
| 5 (1) $-13 \leq 5x + 2 < 37$ (2) $-6 < -x + 1 \leq 4$ |
| 6 (1) × (2) ○ (3) × (4) ○ (5) ○ |
| 7 (1) $x < -2$ (2) $x \geq 8$ (3) $x \leq -3$
(4) $x < -6$ (5) $x \leq 17$ (6) $x < 2$ (7) $x < 5$ |
| 8 94점 9 8명 10 $\frac{7}{3}$ km |

- 3 (1) $x=6$ 을 부등식에 대입하면
 $6 + 5 \leq 2 \times 6$ (참)
 (2) $x=3$ 을 부등식에 대입하면
 $3 \leq -2 + 4 \times 3$ (참)
 (3) $x=1$ 을 부등식에 대입하면
 $2 \times 1 + 1 \leq 1$ (거짓)
 (4) $x=0$ 을 부등식에 대입하면
 $3 \times 0 + 1 \leq -2$ (거짓)
 (5) $x=-4$ 를 부등식에 대입하면
 $-4 > 2 \times (-4) + 2$ (참)

4 (2) $a > b$
 $2a > 2b$
 $\therefore 2a+1 > 2b+1$

(3) $a > b$
 $-4a < -4b$
 $\therefore -4a+3 < -4b+3$

(4) $a > b$
 $-5a < -5b$
 $\therefore 1-5a < 1-5b$

(5) $a > b$
 $-\frac{1}{6}a < -\frac{1}{6}b$
 $\therefore -\frac{1}{6}a - \frac{1}{3} < -\frac{1}{6}b - \frac{1}{3}$

5 (1) $-3 \leq x < 7$
 $-15 \leq 5x < 35$
 $\therefore -13 \leq 5x+2 < 37$

(2) $-3 \leq x < 7$
 $-7 < -x \leq 3$
 $\therefore -6 < -x+1 \leq 4$

6 (1) $x-5 < x+3$ 에서 $-8 < 0$ (일차부등식이 아니다.)
(2) $2x^2+x+1 \geq 2$ 에서 $2x^2+x-1 \geq 0$
(일차부등식이 아니다.)
(4) $x^2+4x+1 \leq x^2+3$ 에서 $4x-2 \leq 0$ (일차부등식)
(5) $3x-4 < x+2$ 에서 $2x-6 < 0$ (일차부등식)

7 (1) $5x+8 < -3x-8$
 $8x < -16$
 $\therefore x < -2$

(2) $2x+9 \leq 5(x-3)$
 $2x+9 \leq 5x-15$
 $-3x \leq -24$
 $\therefore x \geq 8$

(3) $0.16x+0.4 \leq 0.01x-0.05$
 $16x+40 \leq x-5$
 $15x \leq -45$
 $\therefore x \leq -3$

(4) $1.3(2x-3) > 3.5x+1.5$
 $13(2x-3) > 35x+15$
 $26x-39 > 35x+15$
 $-9x > 54$
 $\therefore x < -6$

(5) $\frac{3}{5}x + \frac{6}{5} \geq \frac{7}{10}x - \frac{1}{2}$
 $6x+12 \geq 7x-5$
 $-x \geq -17$
 $\therefore x \leq 17$

(6) $\frac{5x-1}{3} < 2 + \frac{x}{2}$
 $2(5x-1) < 12+3x$
 $10x-2 < 12+3x$
 $7x < 14$
 $\therefore x < 2$

(7) $\frac{2-x}{5} > 0.2(x-8)$
 $\frac{2-x}{5} > \frac{1}{5}(x-8)$
 $2-x > x-8$
 $-2x > -10$
 $\therefore x < 5$

8 네 번째 시험 성적을 x 점이라 하면
 $\frac{85+88+93+x}{4} \geq 90$
 $266+x \geq 360 \quad \therefore x \geq 94$
따라서 네 번째 시험에서 94점 이상을 받아야 한다.

9 소인을 x 명이라 하면 대인은 $(12-x)$ 명이므로
 $10000(12-x) + 7000x \leq 96000$
 $120000 - 10000x + 7000x \leq 96000$
 $-3000x \leq -24000 \quad \therefore x \geq 8$
따라서 소인은 최소 8명 이상이다.

10 역에서 편의점까지의 거리를 x km라 하면
 $\frac{x}{4} + \frac{20}{60} + \frac{x}{4} \leq 1\frac{30}{60}$
 $3x+4+3x \leq 18, 6x \leq 14 \quad \therefore x \leq \frac{7}{3}$
따라서 역에서 $\frac{7}{3}$ km 이내에 있는 편의점에 갈 수 있다.