Solutions

2.1

- $-3,\ -2.5,\ -0.4,\ 0,\ 1$: the negative with the largest size is the smallest

2.2

(a) $-15 + 8 = -7$, then $-7 - 6 = \mathbf{-13}$

(b) subtracting -9 adds 9: $-5 + 9 = \mathbf{4}$

2.3

(a) same signs give a positive: **28**

(b) different signs give a negative: $\mathbf{-4}$

2.4

- $24 \times 35 = 24 \times 30 + 24 \times 5 = 720 + 120 = 840$
- $1 + 2 = 3$ decimal places: $2.4 \times 0.35 = 0.840 = \mathbf{0.84}$

2.5

- multiply both by 100: $5.04 \div 0.12 = 504 \div 12$
- $12 \times 40 = 480$ and $12 \times 2 = 24$, so $504 \div 12 = \mathbf{42}$

2.6

(a) the index applies to 5 only: $-5^2 = -(5 \times 5) = \mathbf{-25}$

(b) $(-5)^2 = (-5) \times (-5) = \mathbf{25}$

2.7

- $-0.25 = -\frac{1}{4}$, so the reciprocal is $\mathbf{-4}$; check: $-0.25 \times (-4) = 1$

3.1

(a) $-\frac{4}{5} = -0.8$ and $-\frac{3}{4} = -0.75$; -0.8 is farther left: $-\frac{4}{5} < -\frac{3}{4}$

(b) $-\frac{2}{3} = -0.666\ldots$, which is farther left than -0.6: $-0.6 > -\frac{2}{3}$

3.2

(a)

- at 14:00: $-14 + 9 = -5$ °C
- at 22:00: $-5 - 6 = \mathbf{-11}$ °C

(b) difference $= 4 - (-11) = 4 + 11 = \mathbf{15}$ °C

3.3

(a) 4.7×23.6 has $1 + 1 = 2$ decimal places: $\mathbf{110.92}$

(b) $11\,092 \div 236 = 47$, and dividing by $0.236 = 236 \div 1000$ makes the answer 1000 times larger: $\mathbf{47\,000}$

(c) $0.47 \times 2360 = (47 \div 100) \times (236 \times 10) = 11\,092 \div 10 = \mathbf{1109.2}$

3.4

- $(-2)^3 = (-2) \times (-2) \times (-2) = -8$
- $-3 \times (-4) = +12$ and $(-18) \div 6 = -3$
- $-8 + 12 - 3 = \mathbf{1}$

3.5

- cost $= 40 \times 7.50 =$ ¥300
- income $= 32 \times 12.00 + 8 \times 4.50 = 384 + 36 =$ ¥420
- profit $=$ income $-$ cost $= 420 - 300 = 120$: a **profit of ¥120**