

Review Exercises (Ch. 2)

1)

$$\begin{aligned} \text{a)} \quad & 6 + (124 + 58) \\ & = (6 + 124) + 58 \\ & = 130 + 58 \\ & = 188 \end{aligned}$$

$$\begin{aligned} \text{b)} \quad & (189 + 43) + 17 \\ & = 189 + (43 + 17) \\ & = 189 + 60 \\ & = 249 \end{aligned}$$

3)

$$\begin{aligned} \text{a)} \quad & (7 \cdot 8) \cdot 5 \\ & = 7 \cdot (8 \cdot 5) \\ & = 7 \cdot 40 \\ & = 280 \end{aligned}$$

$$\begin{aligned} \text{b)} \quad & \frac{1}{3} \cdot (3 \cdot 467) \\ & = \left(\frac{1}{3} \cdot 3\right) \cdot 467 \\ & = 1 \cdot 467 \\ & = 467 \end{aligned}$$

5)

$$\begin{aligned} \text{a)} \quad & 3 \cdot (40 + 7) \\ & = 3 \cdot 40 + 3 \cdot 7 \\ & = 120 + 21 \\ & = 141 \end{aligned}$$

$$\begin{aligned} \text{b)} \quad & 4 \cdot (90 - 2) \\ & = 4 \cdot 90 - 4 \cdot 2 \\ & = 360 - 8 \\ & = 352 \end{aligned}$$

$$\begin{aligned} \text{c)} \quad & 6 \cdot (8 + 10) \\ & = 6 \cdot 8 + 6 \cdot 10 \\ & = 48 + 60 \\ & = 108 \end{aligned}$$

$$\text{d)} \quad 2 \cdot (x + y) = 2 \cdot x + 2 \cdot y = 2x + 2y$$

$$\text{e)} \quad 9 \cdot (a - b) = 9 \cdot a - 9 \cdot b = 9a - 9b$$

$$\text{f)} \quad 8 \cdot (x - y) = 8 \cdot x - 8 \cdot y = 8x - 8y$$

7)

$$\begin{array}{ll} \text{a)} \quad 8 + 4 \div 4 & \text{There are no grouping symbols} \\ & = 8 + 1 \quad \text{Perform } \cdot \text{ and } \div \text{ from left to right} \end{array}$$

= 9 Perform + and - from left to right

b) $3 + 5^2 - (7 + 2)$
 $= 3 + 5^2 - 9$ Evaluate expression in parentheses first
 $= 3 + 25 - 9$ Evaluate exponents and roots from left to right
 $= 28 - 9$ Perform + and - from left to right
 $= 19$ Perform + and - from left to right

c) $\frac{\sqrt{5+20}-7}{2}$ Fraction bar is a grouping symbol
 $= \frac{\sqrt{25}-7}{2}$ Evaluate exponents and roots from left to right
 $= \frac{5-7}{2}$ Perform + and - from left to right
 $= \frac{-2}{2}$ Perform + and - from left to right
 $= -1$ Simplify

9)

- a) -4
- b) 0
- c) 1

11) Answers will vary

13) Answers will vary

15)

a)

x	$5x - 2$	$6x - (x + 2)$
4	18	18
3	13	13
-2	-12	-12

The expressions $5x - 2$ and $6x - (x + 2)$ are equivalent.

b)

x	$\sqrt{x^2 + 2} - x + 1$	$x + 1$
4	5	5
3	4	4
-2	1	-1

The expressions $\sqrt{x^2 + 2} - x + 1$ and $x + 1$ are not equivalent. The output values for $x = -2$ are different.

c)

x	$(x - 1)(x + 1)$	$x^2 - 1$
4	15	15
3	8	8
-2	3	3

The expressions $(x - 1)(x + 1)$ and $x^2 - 1$ are equivalent.

17)

a) $6y + 9y = 15y$

b) $4x - x = 4x - 1x = 3x$

c) $a^2 - 3a + 2a^2 - 9a$
 $= (a^2 + 2a^2) + (-3a - 9a)$
 $= 3a^2 - 12a$

Group like terms

Combine like terms

19)

a) $a + 5$

b) $b + 4$

c) $c - 4$

d) $d - 2$

e) $2e$

f) $\frac{1}{3}f$

g) $7g$

h) $\frac{h}{6}$

i) $\frac{i}{3}$

j) $3j + 4$

k) $3k - 4$

21) Let h denote the length of the hypotenuse. From FACT 2.7 we see that

$$h = \sqrt{\text{BASE}^2 + \text{HEIGHT}^2}$$

$$h = \sqrt{(30 \text{ cm})^2 + (40 \text{ cm})^2}$$

$$h = \sqrt{900 \text{ cm}^2 + 1600 \text{ cm}^2}$$

$$h = \sqrt{2500 \text{ cm}^2}$$

$$h = 50 \text{ cm}$$

23) In the coordinate plane, every point on a vertical line has the same x value or x -coordinate. Only the y -coordinate varies on a vertical line.

25)

a) Rise = $4 - ^{-}2 = 4 + 2 = 6$
Run = $^{-}3 - 1 = ^{-}3 + ^{-}1 = ^{-}4$

b) Rise = $^{-}3 - 6 = ^{-}3 + ^{-}6 = ^{-}9$
Run = $^{-}2 - 2 = ^{-}2 + ^{-}2 = ^{-}4$

27) Ending point will be $(3 + -2, -4 + 1) = (1, -3)$

29) These particular settings will cause the corners of the viewing window to be located at the coordinates $(10, 10)$, $(-10, 10)$, $(-10, -10)$, and $(10, -10)$.

31)

a) $2^{\text{nd}} \sqrt{((-6 - 2)^2 + (7 - -1)^2)}$

b) $d = 11.31$

33)

a) $y = 0.25x + 100$

b) Independent variable = x (the number of travel miles)

c) Dependent variable = y (the cost of the trip)

35)

