16. $\dfrac{x}{\frac{1}{2}} = 4$

$\dfrac{\frac{1}{2}x}{\frac{1}{2}} = 4 \cdot \dfrac{1}{2}$

$x = \mathbf{2}$

17. $(-5) - 5 = 0 \qquad 5 - 5 = 0$

$-10 \neq 0 \qquad 0 = 0$

Therefore, **5 satisfies the equation.**

18. $m^2xyp^2x^3y^5 = m^2p^2xx^3yy^5 = \mathbf{m^2p^2x^4y^6}$

19. $3p^2xxypp^3xy^2 = 3p^2pp^3xxxyy^2 = \mathbf{3p^6x^3y^3}$

20. $a + 3 - 2a - 5a + 5 - a = 8 - 7a = \mathbf{-7a + 8}$

21. $-3x^2ym + 5myx^2 - 2my^2x = \mathbf{2mx^2y - 2mxy^2}$

22. $(3a - 5p)xy = (3a)xy + (-5p)xy = \mathbf{3axy - 5pxy}$

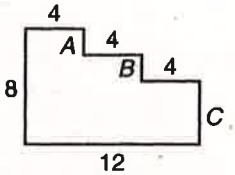
23. $(-x)^3 - y = [-(-2)]^3 - 4 = 2^3 - 4 = 8 - 4$
$= \mathbf{4}$

24. $a^3 - (a - b) + |a - b|$
$= (-2)^3 - (-2 - 3) + |-2 - 3|$
$= -8 - (-5) + |-5| = -8 + 5 + 5 = \mathbf{2}$

25. $-2\{-5(-3 + 4) - [3 - (-4)]\}$
$= -2[-5(1) - (3 + 4)] = -2(-5 - 7)$
$= -2(-12) = \mathbf{24}$

26. $(-2)^3 - (-2)^2 - 5 + \sqrt[3]{-64} = -8 - 4 - 5 - 4$
$= \mathbf{-21}$

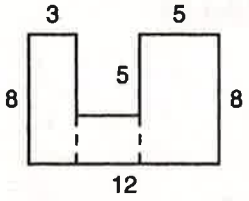
27.



$A + B + C = 8$

$P = 12 + 8 + 4 + A + 4 + B + 4 + C$
$= 12 + 8 + 4 + 4 + 4 + (A + B + C)$
$= 12 + 8 + 4 + 4 + 4 + 8$
$= \mathbf{40\ km}$

28.



$A = (3\text{ in.} \times 8\text{ in.}) + (5\text{ in.} \times 8\text{ in.})$
$+ (3\text{ in.} \times 4\text{ in.})$
$= 24\text{ in.}^2 + 40\text{ in.}^2 + 12\text{ in.}^2$
$= \mathbf{76\ in.^2}$

29. $\text{Area} = \text{Area}_{\text{triangle}} - \text{Area}_{\text{circle}}$
$= \frac{1}{2}(16\text{ ft})(13\text{ ft}) - \pi(4\text{ ft})^2$
$= 104\text{ ft}^2 - 16\pi\text{ ft}^2$
$= \mathbf{(104 - 16\pi)\ ft^2 = 53.76\ ft^2}$

30. $V = (\text{Area}_{\text{base}})(\text{Height})$
$= (95\text{ cm}^2)(16\text{ cm}) = \mathbf{1520\ cm^3}$

Practice 25

a. $\dfrac{2}{5}x - \dfrac{3}{10} = \dfrac{1}{2}$

$+\dfrac{3}{10} \quad +\dfrac{3}{10}$

$\dfrac{2}{5}x = \dfrac{8}{10}$

$\dfrac{5}{2} \cdot \dfrac{2}{5}x = \dfrac{8}{10} \cdot \dfrac{5}{2}$

$x = \dfrac{4}{2}$

$x = \mathbf{2}$

b. $2\frac{1}{4}x + \dfrac{3}{7} = \dfrac{5}{14}$

$-\dfrac{3}{7} \quad -\dfrac{3}{7}$

$2\frac{1}{4}x = -\dfrac{1}{14}$

$\dfrac{9}{4}x = -\dfrac{1}{14}$

$\dfrac{4}{9} \cdot \dfrac{9}{4}x = -\dfrac{1}{14} \cdot \dfrac{4}{9}$

$x = \mathbf{-\dfrac{2}{63}}$

c. $1.2 = -1.4 + 20x$

$+1.4 \quad +1.4$

$2.6 = 20x$

$\frac{20x}{20} = \frac{2.6}{20}$

$x = \mathbf{0.13}$

d. $0.7x - 0.4 = 0.16$

$+0.4 \quad +0.4$

$0.7x = 0.56$

$\frac{0.7x}{0.7} = \frac{0.56}{0.7}$

$x = \mathbf{0.8}$

Problem Set 25

1. **(a), (d)**

2. (a) **Subtraction**

(b) **Addition**

(c) **Division**

(d) **Multiplication**

3. $508 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} = \frac{\mathbf{508}}{\mathbf{2.54}} \textbf{ in.} = \mathbf{200 \text{ in.}}$

4. $15{,}000 \text{ cm} \cdot \text{cm} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ m}}{100 \text{ cm}}$

$= \frac{\mathbf{15{,}000}}{\mathbf{(100)^2}} \textbf{ m}^2 = \mathbf{1.5 \text{ m}^2}$

5. $A = S^2$

$9 \text{ cm}^2 = S^2$

Each side is 3 cm because $3 \text{ cm} \times 3 \text{ cm} = 9 \text{ cm}^2$.

$P = 4S = 4(3 \text{ cm}) = \mathbf{12 \text{ cm}}$

6. $x - 5 = 3$

$+5 \quad +5$

$x = \mathbf{8}$

7. $x + \frac{1}{2} = \frac{2}{3}$

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

$x = \frac{2}{3} - \frac{1}{2}$

$x = \frac{4}{6} - \frac{3}{6}$

$x = \mathbf{\frac{1}{6}}$

8. $x + 3\frac{1}{3} = 5$

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

$x = 5 - 3\frac{1}{3}$

$x = \frac{15}{3} - \frac{10}{3}$

$x = \mathbf{\frac{5}{3}}$

9. $4x = 2\frac{2}{3}$

$\frac{4x}{4} = \frac{2\frac{2}{3}}{4}$

$x = \frac{\frac{8}{3}}{4}$

$x = \frac{8}{3} \cdot \frac{1}{4}$

$x = \mathbf{\frac{2}{3}}$

10. $2x + 3 = 11$

$-3 \quad -3$

$2x = 8$

$\frac{2x}{2} = \frac{8}{2}$

$x = \mathbf{4}$

11. $3x - 4 = 10$

$+4 \quad +4$

$3x = 14$

$\frac{3x}{3} = \frac{14}{3}$

$x = \mathbf{\frac{14}{3}}$

12. $-2x - 2 = 10$

$+2 \quad +2$

$-2x = 12$

$\frac{-2x}{-2} = \frac{12}{-2}$

$x = \mathbf{-6}$

13. $\frac{1}{8}m - \frac{1}{4} = \frac{3}{4}$

$+\frac{1}{4} \quad +\frac{1}{4}$

$\frac{1}{8}m = 1$

$\frac{8}{1} \cdot \frac{1}{8}m = 1 \cdot \frac{8}{1}$

$m = \mathbf{8}$

14. $0.5x - 0.2 = 0.15$

$+0.2 \quad +0.2$

$0.5x = 0.35$

$\frac{0.5x}{0.5} = \frac{0.35}{0.5}$

$x = \mathbf{0.7}$

15. (a) **1**

(b) **1**

(c) **Yes**

(d) **Yes**

16. $(-2)^2 - 2(-2) = 8 \qquad (4)^2 - 2(4) = 8$

$4 + 4 = 8 \qquad 16 - 8 = 8$

$8 = 8 \qquad 8 = 8$

Therefore, **–2 and 4 are roots of the equation.**

17. $x^2kxk^2x^2ykx^2 = kk^2kx^2xx^2x^2y = \mathbf{k^4x^7y}$

18. $aaa^3bxa^2b^3abx^4 = aaa^3a^2abb^3bxx^4 = \mathbf{a^8b^5x^5}$

19. $6c - 6 - 2c - 5 - 3c + 7 = \mathbf{c - 4}$

20. $a^2xx + a^2x^2 - 3x^2aa = a^2x^2 + a^2x^2 - 3a^2x^2$

$= \mathbf{-a^2x^2}$

21. $4x(2y - 3 + 2a) = 4x(2y) + 4x(-3) + 4x(2a)$

$= \mathbf{8xy - 12x + 8ax}$

22. $-b(b - a) = -1[1 - (-2)] = -1(1 + 2)$

$= -1(3) = \mathbf{-3}$

23. $a(a^3 - b) - b = -2[(-2)^3 - 3] - 3$

$= -2(-8 - 3) - 3 = -2(-11) - 3$

$= 22 - 3 = \mathbf{19}$

24. $-3^2 + (-3)^3 - 4 - \sqrt[3]{27} = -9 - 27 - 4 - 3$

$= \mathbf{-43}$

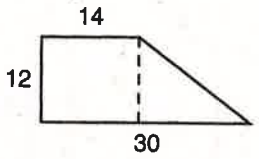
25. $\frac{20 - 8 + (-6)(-2)}{8(-5) + 10} = \frac{20 - 8 + 12}{-40 + 10} = \frac{24}{-30}$

$= \mathbf{-\frac{4}{5}}$

26. $P = 5\text{ m} + 5\text{ m} + 5\text{ m} + \frac{2\pi\left(\frac{5}{2}\right)}{2}\text{ m}$

$= \mathbf{\left(15 + \frac{5\pi}{2}\right)\text{m} = 22.85\text{ m}}$

27.



$A = (14\text{ km})(12\text{ km}) + \frac{1}{2}(16\text{ km})(12\text{ km})$

$= 168\text{ km}^2 + 96\text{ km}^2 = \mathbf{264\text{ km}^2}$

28. $y = 180 - 110 - 48 = \mathbf{22}$

29.
$$\begin{array}{r} \mathbf{0.02} \\ 318\overline{)6.36} \\ \underline{6\,36} \end{array}$$

30. $S.A. = 2(\text{Area}_{\text{triangle}}) + \text{Area}_{\text{top}} + \text{Area}_{\text{bottom}}$

$+ \text{Area}_{\text{side}}$

$= 2\left[\frac{1}{2}(12\text{ in.} \times 9\text{ in.})\right] + (15\text{ in.} \times 10\text{ in.})$

$+ (12\text{ in.} \times 10\text{ in.}) + (9\text{ in.} \times 10\text{ in.})$

$= 2(54\text{ in.}^2) + 150\text{ in.}^2 + 120\text{ in.}^2 + 90\text{ in.}^2$

$= 108\text{ in.}^2 + 360\text{ in.}^2$

$= \mathbf{468\text{ in.}^2}$

Practice 26

a. $3m - 7m = 8m - 6$

$-4m = 8m - 6$

$-8m \quad -8m$

$-12m = \quad -6$

$\frac{-12m}{-12} = \frac{-6}{-12}$

$m = \mathbf{\frac{1}{2}}$

b. $5 - 6p = 9p - 7 + 8p - 3 + 2p$

$5 - 6p = 19p - 10$

$-19p \quad -19p$

$5 - 25p = \quad -10$

$-5 \qquad\qquad -5$

$-25p = \quad -15$

$\frac{-25p}{-25} = \frac{-15}{-25}$

$p = \mathbf{\frac{3}{5}}$

c. $2x + 3x + 4x - 5 = 2 + 3 + 4x$

$$\begin{array}{r} 9x - 5 = 5 + 4x \\ -4x \qquad\quad -4x \\ \hline 5x - 5 = 5 \\ +5 \quad +5 \\ \hline 5x = 10 \end{array}$$

$$\frac{5x}{5} = \frac{10}{5}$$

$$x = \mathbf{2}$$

d. $3p + 7 - (-3) = p + (-2)$

$$\begin{array}{r} 3p + 10 = p - 2 \\ -p \qquad -p \\ \hline 2p + 10 = -2 \\ -10 \quad -10 \\ \hline 2p = -12 \end{array}$$

$$\frac{2p}{2} = \frac{-12}{2}$$

$$p = \mathbf{-6}$$

Problem Set 26

1. **Negative number**

2. (a) **{1, 2, 3, ...}**

(b) **{0, 1, 2, 3, ...}**

(c) **{..., –3, –2, –1, 0, 1, 2, 3, ...}**

3. $1000 \text{ cm} \times \dfrac{1 \text{ m}}{100 \text{ cm}} = \dfrac{\mathbf{1000}}{\mathbf{100}} \textbf{ m} = \textbf{10 m}$

4. $525 \text{ cm} \cdot \text{cm} \times \dfrac{1 \text{ in.}}{2.54 \text{ cm}} \times \dfrac{1 \text{ in.}}{2.54 \text{ cm}}$

$$= \frac{\mathbf{525}}{\mathbf{(2.54)^2}} \textbf{ in.}^2 = \textbf{81.38 in.}^2$$

5. $A = \dfrac{1}{2}(15 \text{ in.})(12 \text{ in.}) = \textbf{90 in.}^2$

6.

$$\begin{aligned} A &= \pi r^2 \\ 16\pi \text{ ft}^2 &= \pi r^2 \\ 16(3.14) \text{ ft}^2 &= (3.14) r^2 \\ 50.24 \text{ ft}^2 &= 3.14 r^2 \\ \frac{50.24 \text{ ft}^2}{3.14} &= r^2 \\ 16 \text{ ft}^2 &= r^2 \end{aligned}$$

The radius is **4 ft** because $4 \text{ ft} \times 4 \text{ ft} = 16 \text{ ft}^2$.

7. $k - \dfrac{2}{3} = 3\dfrac{1}{3}$

$$\begin{array}{r} +\frac{2}{3} \quad +\frac{2}{3} \\ \hline k = 3\frac{1}{3} + \frac{2}{3} \end{array}$$

$$k = \mathbf{4}$$

8. $7x = 49$

$$\frac{7x}{7} = \frac{49}{7}$$

$$x = \mathbf{7}$$

9. $2\dfrac{1}{2}x = \dfrac{3}{7}$

$$\frac{2\frac{1}{2}x}{2\frac{1}{2}} = \frac{\frac{3}{7}}{2\frac{1}{2}}$$

$$x = \frac{\frac{3}{7}}{\frac{5}{2}}$$

$$x = \frac{3}{7} \cdot \frac{2}{5}$$

$$x = \frac{\mathbf{6}}{\mathbf{35}}$$

10. $3x - 4 = 7$

$$\begin{array}{r} +4 \quad +4 \\ \hline 3x = 11 \end{array}$$

$$\frac{3x}{3} = \frac{11}{3}$$

$$x = \frac{\mathbf{11}}{\mathbf{3}}$$

11. $-3y + \dfrac{1}{2} = \dfrac{5}{7}$

$$\begin{array}{r} -\frac{1}{2} \quad -\frac{1}{2} \\ \hline -3y = \frac{3}{14} \end{array}$$

$$\frac{-3y}{-3} = \frac{\frac{3}{14}}{-3}$$

$$y = \frac{3}{14} \cdot -\frac{1}{3}$$

$$y = -\frac{\mathbf{1}}{\mathbf{14}}$$

12. $0.4x - 0.3 = -0.14$
$+0.3 \quad +0.3$
$0.4x = 0.16$
$\frac{0.4x}{0.4} = \frac{0.16}{0.4}$
$x = \mathbf{0.4}$

13. $3x - 2 = 6x + 4$
$-6x \quad -6x$
$-3x - 2 = 4$
$+2 \quad +2$
$-3x = 6$
$\frac{-3x}{-3} = \frac{6}{-3}$
$x = \mathbf{-2}$

14. $2x + x + 3 = x + 2 - 5$
$3x + 3 = x - 3$
$-x \quad -x$
$2x + 3 = -3$
$-3 \quad -3$
$2x = -6$
$\frac{2x}{2} = \frac{-6}{2}$
$x = \mathbf{-3}$

15. $-m - 6m + 4 = -2m - 5$
$-7m + 4 = -2m - 5$
$+2m \quad +2m$
$-5m + 4 = -5$
$-4 \quad -4$
$-5m = -9$
$\frac{-5m}{-5} = \frac{-9}{-5}$
$m = \mathbf{\frac{9}{5}}$

16. (a) **10**
(b) **10**
(c) **Yes**
(d) **Yes**

17. $(-7) + 7 = 0 \qquad (7) + 7 = 0$
$0 = 0 \qquad 14 \neq 0$
Therefore, **–7 satisfies the equation.**

18. $m^2y^5myy^3m^3 = m^2mm^3y^5yy^3 = \mathbf{m^6y^9}$

19. $k^5mmm^2k^2m^2k^3aa^2 = aa^2k^5k^2k^3mmm^2m^2$
$= \mathbf{a^3k^{10}m^6}$

20. $a - ax + 2xa - 3a - 3 = \mathbf{-2a + ax - 3}$

21. $a^2bc + 2bc - bca^2 + 5ca^2b - 3cb = \mathbf{5a^2bc - bc}$

22. $4(7 - 3x^2) = 4(7) + 4(-3x^2) = \mathbf{28 - 12x^2}$

23. $x(y - a) + a(y - x)$
$= -3[2 - (-1)] + (-1)[2 - (-3)]$
$= -3(2 + 1) - 1(2 + 3) = -3(3) - 1(5)$
$= -9 - 5 = \mathbf{-14}$

24. $a(-a^2 + b) - |b - a|$
$= -2[-(-2)^2 + 4] - |4 - (-2)|$
$= -2(-4 + 4) - |4 + 2| = -2(0) - 6 = \mathbf{-6}$

25. $-4(-3 + 2) - 3 - (-4) - |-3 + 2|$
$= -4(-1) - 3 + 4 - |-1| = 4 - 3 + 4 - 1 = \mathbf{4}$

26. $-3^2 - (-3)^3 + (-2) - \sqrt[3]{-125}$
$= -9 - (-27) - 2 - (-5)$
$= -9 + 27 - 2 + 5 = \mathbf{21}$

27. $P = (500 + 620 + 400 + 210 + 100 + 410)$ mi
$= \mathbf{2240 \text{ mi}}$

28. $A = \frac{1}{2}(9 \text{ cm})(12 \text{ cm}) = \mathbf{54 \text{ cm}^2}$

29. $4\frac{2}{3} + 5\frac{1}{4} + 9\frac{1}{12} = 4\frac{8}{12} + 5\frac{3}{12} + 9\frac{1}{12}$
$= 18\frac{12}{12} = \mathbf{19 \text{ m}}$

30. $V = (\text{Area}_{\text{base}})(\text{Height})$
$= [\pi(2 \text{ km})^2](6 \text{ km})$
$= \mathbf{24\pi \text{ km}^3 = 75.36 \text{ km}^3}$

Practice 27

a. $xy^2(y^2p - p) = (xy^2)(y^2p) + (xy^2)(-p)$
$= \mathbf{xy^4p - xy^2p}$

b. $(xy - x)2xy = (2xy)(xy) + (2xy)(-x)$
$= \mathbf{2x^2y^2 - 2x^2y}$

c. $3xp^3(p^5 - x^2p^8) = (3xp^3)(p^5) + (3xp^3)(-x^2p^8)$
$= \mathbf{3xp^8 - 3x^3p^{11}}$

d. $2x^2m^2(m^2 - 4m)$
$= (2x^2m^2)(m^2) + (2x^2m^2)(-4m)$
$= \mathbf{2x^2m^4 - 8x^2m^3}$

e. $0.08x - 0.1 = 16.7$
$8x - 10 = 1670$
$8x = 1680$
$x = \mathbf{210}$

f. $0.7m + 0.6m = 3.4$

$7m + 6m = 34$

$13m = 34$

$m = \frac{34}{13}$

$m = \mathbf{2\frac{8}{13}}$

Problem Set 27

1. **(a), (c), (d)**

2. **The angles opposite the sides of equal length have equal measures.**

3. $63{,}400 \text{ in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} = \frac{\mathbf{63{,}400}}{\mathbf{(12)(5280)}} \textbf{ mi}$

$= \mathbf{1.00 \text{ mi}}$

4. $5800 \text{ in.} \cdot \text{in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} \times \frac{1 \text{ ft}}{12 \text{ in.}} = \frac{\mathbf{5800}}{\mathbf{(12)^2}} \textbf{ ft}^2$

$= \mathbf{40.28 \text{ ft}^2}$

5. $P = 4S$

$12 \text{ cm} = 4S$

$S = \frac{12 \text{ cm}}{4}$

$S = 3 \text{ cm}$

$A = S^2 = (3 \text{ cm})^2 = \mathbf{9 \text{ cm}^2}$

6. $x - \frac{1}{4} = \frac{5}{8}$

$+\frac{1}{4} \quad +\frac{1}{4}$

$x = \frac{5}{8} + \frac{1}{4}$

$x = \mathbf{\frac{7}{8}}$

7. $1\frac{1}{2}y = 6\frac{3}{4}$

$\frac{1\frac{1}{2}y}{1\frac{1}{2}} = \frac{6\frac{3}{4}}{1\frac{1}{2}}$

$y = \frac{\frac{27}{4}}{\frac{3}{2}}$

$y = \frac{27}{4} \cdot \frac{2}{3}$

$y = \mathbf{\frac{9}{2}}$

8. $\frac{x}{3\frac{1}{2}} = 4$

$\frac{3\frac{1}{2}x}{3\frac{1}{2}} = 4 \cdot 3\frac{1}{2}$

$x = 4 \cdot \frac{7}{2}$

$x = \mathbf{14}$

9. $\frac{1}{2}x + \frac{3}{4} = -\frac{3}{8}$

$-\frac{3}{4} \quad -\frac{3}{4}$

$\frac{1}{2}x = -\frac{9}{8}$

$\frac{2}{1} \cdot \frac{1}{2}x = -\frac{9}{8} \cdot \frac{2}{1}$

$x = \mathbf{-\frac{9}{4}}$

10. $0.02m + 0.2 = 1.4$

$2m + 20 = 140$

$2m = 120$

$m = \mathbf{60}$

11. $0.4x - 0.2 = -0.12$

$40x - 20 = -12$

$40x = 8$

$x = \frac{8}{40}$

$x = \mathbf{0.2}$

12. $5x - 3 - 2 = 3x - 2 + x$

$5x - 5 = 4x - 2$

$-4x \quad -4x$

$x - 5 = -2$

$+5 \quad +5$

$x = \mathbf{3}$

13. $x + 3 - 5 - 2x = x - 3 - 7x$

$-x - 2 = -6x - 3$

$+6x \quad +6x$

$5x - 2 = -3$

$+2 \quad +2$

$5x = -1$

$\frac{5x}{5} = \frac{-1}{5}$

$x = \mathbf{-\frac{1}{5}}$

14. $m + 4m - 2 - 2m = 2m + 2 - 3$

$3m - 2 = 2m - 1$

$-2m \qquad -2m$

$m - 2 = \qquad -1$

$+2 \qquad +2$

$m = \mathbf{1}$

15. (a) **–1**

(b) **–1**

(c) **Yes**

(d) **Yes**

16. $(-3)^2 + 2(-3) = 3 \qquad (1)^2 + 2(1) = 3$

$9 - 6 = 3 \qquad 1 + 2 = 3$

$3 = 3 \qquad 3 = 3$

Therefore, **–3 and 1 are roots of the equation.**

17. $p^2xyy^2x^2yx^2x = p^2xx^2x^2xyy^2y = \mathbf{p^2x^6y^4}$

18. $3p^2x^4yp^5xxyy^2 = 3p^2p^5x^4xxyyy^2 = \mathbf{3p^7x^6y^4}$

19. $-4x + x^2 - 3x - 5 + 7x^2 = \mathbf{-7x + 8x^2 - 5}$

20. $xyp^2 - 4p^2xy + 5xp^2y - 7yxp^2 = \mathbf{-5p^2xy}$

21. $4x^2(ax - 2) = (4x^2)(ax) + (4x^2)(-2)$

$= \mathbf{4ax^3 - 8x^2}$

22. $(a - b) + (-a)^2 = (-3 - 6) + [-(-3)]^2$

$= -9 + 9 = \mathbf{0}$

23. $-(-p)^2 + (p - x) = -[-(-2)]^2 + (-2 - 5)$

$= -(2)^2 - 7 = -4 - 7 = \mathbf{-11}$

24. $-3^2 - 3(3^2 - 4) \div \sqrt[4]{16} - |-7 + 2|$

$= -9 - 3(9 - 4) - 2 - |-5|$

$= -9 - 3(5) - 2 - 5 = -9 - 15 - 2 - 5 = \mathbf{-31}$

25. $\dfrac{-6 - (-2 - 3) + 1}{4 - (-3) - 7} = \dfrac{-6 - (-5) + 1}{4 + 3 - 7}$

$= \dfrac{0}{0}$, which is **indeterminate**

26. $P = (14 + 10 + 14 + 10)\text{ m} = \mathbf{48\text{ m}}$

27. $A = (12\text{ km} \times 7\text{ km}) + \dfrac{1}{2}(12\text{ km} \times 11\text{ km})$

$= 84\text{ km}^2 + 66\text{ km}^2 = \mathbf{150\text{ km}^2}$

28. $\text{Area} = \text{Area}_{\text{rectangle}} - \text{Area}_{\text{triangle}}$

$= (9\text{ in.} \times 8\text{ in.}) - \left[\dfrac{1}{2}(6\text{ in.} \times 3\text{ in.})\right]$

$= 72\text{ in.}^2 - 9\text{ in.}^2$

$= \mathbf{63\text{ in.}^2}$

29. Since angles opposite sides of equal length have equal measure, $x = \mathbf{50}$.

$y = 180 - 50 - 50$

$y = \mathbf{80}$

30. $S.A. = 2(\text{Area}_{\text{base}}) + \text{Lateral Surface Area}$

$= 2[\pi(4\text{ ft})^2] + (\text{Perimeter}_{\text{base}})(\text{Height})$

$= 2(16\pi\text{ ft}^2) + [2\pi(4\text{ ft})](7\text{ ft})$

$= 32\pi\text{ ft}^2 + (8\pi\text{ ft})(7\text{ ft})$

$= 32\pi\text{ ft}^2 + 56\pi\text{ ft}^2$

$= \mathbf{88\pi\text{ ft}^2 = 276.32\text{ ft}^2}$

Practice 28

a. $\dfrac{4}{3}WN = 64$

$\dfrac{3}{4} \cdot \dfrac{4}{3}WN = 64 \cdot \dfrac{3}{4}$

$WN = \mathbf{48}$

b. $3\dfrac{1}{5}WN = 48$

$\dfrac{16}{5}WN = 48$

$\dfrac{5}{16} \cdot \dfrac{16}{5}WN = 48 \cdot \dfrac{5}{16}$

$WN = \mathbf{15}$

c. $WF(60) = 48$

$\dfrac{WF \cdot 60}{60} = \dfrac{48}{60}$

$WF = \mathbf{\dfrac{4}{5}}$

d. $\left(4\dfrac{1}{2}\right)(220) = WN$

$WN = \dfrac{9}{2} \cdot 220$

$WN = \mathbf{990}$

e. $f(x) = x^2 - 3$

$f(-1) = (-1)^2 - 3 = 1 - 3 = \mathbf{-2}$

f. $g(x) = x(x^2 - 3)$

$g(2) = 2(2^2 - 3) = 2(4 - 3) = 2(1) = \mathbf{2}$

Problem Set 28

1. Negative number

2. The sides opposite the angles of equal measure have equal lengths.

3. $3938 \text{ in.} \times \frac{2.54 \text{ cm}}{1 \text{ in.}} \times \frac{1 \text{ m}}{100 \text{ cm}} = \frac{3938(2.54)}{(100)} \text{ m}$

$= \mathbf{100.03 \text{ m}}$

4. $200 \text{ km} \cdot \text{km} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1000 \text{ m}}{1 \text{ km}}$

$= \mathbf{200(1000)^2 \text{ m}^2 = 200{,}000{,}000 \text{ m}^2}$

5. $A = \pi r^2$

$25\pi \text{ in.}^2 = \pi r^2$

$25(3.14) \text{ in.}^2 = (3.14)r^2$

$78.5 \text{ in.}^2 = 3.14r^2$

$\frac{78.5 \text{ in.}^2}{3.14} = r^2$

$25 \text{ in.}^2 = r^2$

The radius is 5 in. because $5 \text{ in.} \times 5 \text{ in.} = 25 \text{ in.}^2$.

$D = 2r = 2(5 \text{ in.}) = \mathbf{10 \text{ in.}}$

6. $\frac{2}{5}WN = 40$

$\frac{5}{2} \cdot \frac{2}{5}WN = 40 \cdot \frac{5}{2}$

$WN = \mathbf{100}$

7. $WF(30) = 25$

$\frac{WF \cdot 30}{30} = \frac{25}{30}$

$WF = \mathbf{\frac{5}{6}}$

8. $f(x) = x + 1$

$f(2) = 2 + 1 = \mathbf{3}$

9. $g(x) = 2x + 1$

$g(-1) = 2(-1) + 1 = -2 + 1 = \mathbf{-1}$

10. $3x = 18$

$\frac{3x}{3} = \frac{18}{3}$

$x = \mathbf{6}$

11. $2x - 3 = -9$

$+3 \quad +3$

$2x = -6$

$\frac{2x}{2} = \frac{-6}{2}$

$x = \mathbf{-3}$

12. $\frac{1}{5}x + \frac{1}{2} = 2\frac{1}{10}$

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

$\frac{1}{5}x = 1\frac{6}{10}$

$\frac{5}{1} \cdot \frac{1}{5}x = 1\frac{6}{10} \cdot \frac{5}{1}$

$x = \frac{16}{10} \cdot \frac{5}{1}$

$x = \frac{16}{2}$

$x = \mathbf{8}$

13. $0.05x - 0.3 = 1.8$

$5x - 30 = 180$

$5x = 210$

$x = \mathbf{42}$

14. $x - 2 - 2x = 3 - x + 4x$

$-x - 2 = 3x + 3$

$-3x \quad -3x$

$-4x - 2 = 3$

$+2 \quad +2$

$-4x = 5$

$\frac{-4x}{-4} = \frac{5}{-4}$

$x = \mathbf{-\frac{5}{4}}$

15. $3y - y + 2y - 5 = 7 - 2y + 5$

$4y - 5 = -2y + 12$

$+2y \quad +2y$

$6y - 5 = 12$

$+5 \quad +5$

$6y = 17$

$\frac{6y}{6} = \frac{17}{6}$

$y = \mathbf{\frac{17}{6}}$

16. (a) **6**

(b) **6**

(c) **Yes**

(d) **Yes**

17. $(-10) - 10 = 0 \qquad 10 - 10 = 0$

$-20 \neq 0 \qquad 0 = 0$

Therefore, **10 satisfies the equation.**

18. $y^5x^2y^3yxy^2 = x^2xy^5y^3yy^2 = \mathbf{x^3y^{11}}$

19. $m^2myy^2m^3ym = m^2mm^3myy^2y = \mathbf{m^7y^4}$

20. $pc - 4cp + c - p + 7pc - 7c = \mathbf{4cp - 6c - p}$

21. $xym^2 + 3xy^2m - 4m^2xy + 5mxy^2$
$= \mathbf{-3m^2xy + 8mxy^2}$

22. $x^2y(x^3 - xyz^3) = (x^2y)(x^3) + (x^2y)(-xyz^3)$
$= \mathbf{x^5y - x^3y^2z^3}$

23. $p(a) - xp(-a) = -2(3) - 4(-2)(-3)$
$= -6 - 24 = \mathbf{-30}$

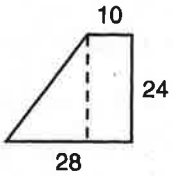
24. $x^3y(x - y) = (-3)^3(1)(-3 - 1) = -27(-4) = \mathbf{108}$

25. $-4(-7 + 5)(-2) - |-2 - 5| = -4(-2)(-2) - |-7|$
$= -16 - 7 = \mathbf{-23}$

26. $-3^2 + (-2)^3 - \sqrt[4]{81} = -9 - 8 - 3 = \mathbf{-20}$

27. $P = \left(5 + 3 + 5 + 3 + \dfrac{2\pi(3)}{2}\right)$ ft
$= \mathbf{(16 + 3\pi)\ ft = 25.42\ ft}$

28.



$A = (10\text{ mi} \times 24\text{ mi}) + \dfrac{1}{2}(18\text{ mi} \times 24\text{ mi})$
$= 240\text{ mi}^2 + 216\text{ mi}^2$
$= \mathbf{456\ mi^2}$

29. Since the sides opposite the angles of equal measure have equal lengths, $x = \mathbf{5}$.

30. $V = (\text{Area}_{\text{base}})(\text{Height})$
$= \left[\dfrac{1}{2}(8\text{ cm} \times 13\text{ cm})\right](12\text{ cm})$
$= (52\text{ cm}^2)(12\text{ cm})$
$= \mathbf{624\ cm^3}$

Practice 29

a. $\dfrac{1}{2^{-3}} = 2^3 = \mathbf{8}$

b. $(-4)^{-2} = \dfrac{1}{(-4)^2} = \mathbf{\dfrac{1}{16}}$

c. $\dfrac{1}{(-3)^{-2}} = (-3)^2 = \mathbf{9}$

d. $8^0 = \mathbf{1}$

e. $-8^0 = \mathbf{-1}$

f. $(-3)^0 = \mathbf{1}$

g. $(p + m + k^2)^0 = \mathbf{1}$

h. $x^{-3}y^{-8}y^5x^4zx^2z^5 = x^{-3}x^4x^2y^{-8}y^5zz^5 = \mathbf{x^3y^{-3}z^6}$

i. $x^6y^{-3}x^2y^3 = x^6x^2y^{-3}y^3 = x^8y^0 = \mathbf{x^8}$

j. $2x^{-2}y^3(x^2y - 3x^{-1}y^{-3})$
$= 2x^{-2}y^3(x^2y) + 2x^{-2}y^3(-3x^{-1}y^{-3})$
$= 2x^{-2}x^2y^3y - 6x^{-2}x^{-1}y^3y^{-3}$
$= 2x^0y^4 - 6x^{-3}y^0 = \mathbf{2y^4 - 6x^{-3}}$

Problem Set 29

1. **(a), (b)**

2. **Parallelogram**

3. $500\text{ ft} \times \dfrac{12\text{ in.}}{1\text{ ft}} \times \dfrac{2.54\text{ cm}}{1\text{ in.}} = \mathbf{500(12)(2.54)\ cm}$
$= \mathbf{15{,}240\ cm}$

4. $180\text{ yd} \cdot \text{yd} \times \dfrac{3\text{ ft}}{1\text{ yd}} \times \dfrac{3\text{ ft}}{1\text{ yd}} = \mathbf{180(3)^2\ ft^2}$
$= \mathbf{1620\ ft^2}$

5. $A = S^2$
$16\text{ in.}^2 = S^2$
Each side is 4 in. because $4\text{ in.} \times 4\text{ in.} = 16\text{ in.}^2$.
$P = 4S = 4(4\text{ in.}) = \mathbf{16\ in.}$

6. $2^{-2} = \dfrac{1}{2^2} = \mathbf{\dfrac{1}{4}}$

7. $\dfrac{1}{4^{-2}} = 4^2 = \mathbf{16}$

8. $3^0 = \mathbf{1}$

9. $2\frac{1}{4}WN = 72$
$\frac{9}{4}WN = 72$
$\frac{4}{9} \cdot \frac{9}{4}WN = 72 \cdot \frac{4}{9}$
$WN = \mathbf{32}$