28. $\overset{1}{\cancel{3}} \cdot \frac{5}{\cancel{9}_{3}} = \frac{5}{3}$

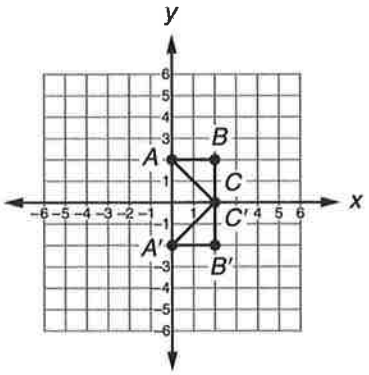
$$7\frac{1}{2} \div \frac{5}{3} = \frac{15}{2} \div \frac{5}{3}$$

$$= \frac{\overset{3}{\cancel{15}}}{2} \times \frac{3}{\cancel{5}_{1}} = \frac{9}{2} = \mathbf{4\frac{1}{2}}$$

29. $2^{-4} + 4^{-2} = \frac{1}{2^4} + \frac{1}{4^2}$

$$= \frac{1}{16} + \frac{1}{16} = \frac{2}{16} = \mathbf{\frac{1}{8}}$$

30.



Lesson 81, Lesson Practice

a. Estimate: $\frac{21}{70} = \frac{3}{10} = 30\%$

$100\% - 30\% = \mathbf{70\%}$

	Percent	Actual Count
Planted with alfalfa	P_P	21
Not planted with alfalfa	P_N	49
Total	100	70

$$\frac{P_N}{100} = \frac{49}{70}$$
$$70P_N = 4900$$
$$P_N = \mathbf{70\%}$$

b. Estimate: $60 \times 3 = \mathbf{180}$ **pages**

	Percent	Actual Count
Pages read	40	120
Pages left to read	60	P
Total	100	T

$$\frac{40}{60} = \frac{120}{P}$$
$$40P = 7200$$
$$P = \mathbf{180}\ \textbf{pages}$$

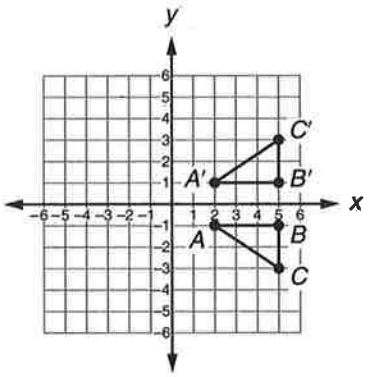
c. Estimate: $\frac{26}{30} = \frac{13}{15} \approx \mathbf{87\%}$

	Percent	Actual Count
Missed	P_M	4
Correct	P_C	26
Total	100	30

$$\frac{P_C}{100} = \frac{26}{30}$$
$$30P_C = 2600$$
$$P_C = \mathbf{86\frac{2}{3}\%}$$

Lesson 81, Mixed Practice

1.



$A'(2, 1), B'(5, 1), C'(5, 3)$

2. (a)

$$\begin{array}{r} 70 \\ 85 \\ 80 \\ 85 \\ 90 \\ 80 \\ 85 \\ 80 \\ 90 \\ 95 \\ 85 \\ 90 \\ 100 \\ 85 \\ +\ 90 \\ \hline 1290 \end{array} \qquad 15\overline{)1290}\ \ \mathbf{86}$$

(b) **85**

3. (a) **85**

(b) $100 - 70 = \mathbf{30}$

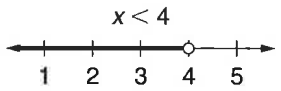
4.
$$\begin{array}{rll} \overset{5}{\cancel{6}}\text{ ft} & \longrightarrow \overset{(12\text{ in.})}{1\text{ in.}} & \longrightarrow \\ -\ 5\text{ ft} & 6\frac{1}{2}\text{ in.} & \\ \hline \overset{5}{\cancel{6}}\text{ ft} & \overset{13}{\cancel{7}}\text{ in.} & \\ -\ 5\text{ ft} & 6\frac{1}{2}\text{ in.} & \\ \hline & \mathbf{6\frac{1}{2}\text{ inches}} & \end{array}$$

5.

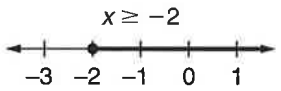
	Case 1	Case 2
Pencils	5	12
Price	75¢	p

$$\frac{5}{\$0.75} = \frac{12}{p}$$
$$5p = \$9.00$$
$$p = \mathbf{\$1.80}$$

6. (a)



(b)



7.

60 questions

$\frac{4}{5}$ answered correctly (48).	12 questions
	12 questions
	12 questions
	12 questions
$\frac{1}{5}$ answered incorrectly.	12 questions

(a) $48 \div 4 = 12$
$5(12\text{ questions}) = \mathbf{60\text{ questions}}$

(b) $\frac{\text{correct answers}}{\text{incorrect answers}} = \frac{48}{12} = \mathbf{\frac{4}{1}}$

8. $3\frac{3}{4} \div 2 = \frac{15}{4} \times \frac{1}{2}$
$= \frac{15}{8} = \mathbf{1\frac{7}{8}\text{ inches}}$

9.

	Ratio	Actual Count
Gleeps	9	G
Bobbles	5	B
Total	14	2800

$$\frac{9}{14} = \frac{G}{2800}$$
$$14G = 25{,}200$$
$$G = \mathbf{1800\text{ gleeps}}$$

10. $(9)^2 + \sqrt{9} = 81 + 3 = \mathbf{84}$

11. **Insufficient information ($m < n$ if both are positive; $m > n$ if both are negative)**

12. (a) $2\frac{1}{4} = 2\frac{25}{100} = \mathbf{2.25}$

(b) $2.25 \times 100\% = \mathbf{225\%}$

(c) $2\frac{1}{4}\% = \frac{2\frac{1}{4}}{100} = \frac{\frac{9}{4}}{100} \cdot \frac{\frac{1}{100}}{\frac{1}{100}} = \mathbf{\frac{9}{400}}$

(d) $2\frac{1}{4}\% = 2.25\% = \mathbf{0.0225}$

13. $p = \mathbf{0.4 \times \$12}$
$p = \mathbf{\$4.80}$

14. $\mathbf{0.5 \times W_N = 0.4}$
$$\frac{0.5 \times W_N}{0.5} = \frac{0.4}{0.5}$$
$W_N = \mathbf{0.8}$

15. $$\frac{16\frac{2}{3}}{100} = \frac{\frac{50}{3}}{\frac{100}{1}}$$
$$\frac{\frac{50}{3}}{\frac{100}{1}} \cdot \frac{\frac{1}{100}}{\frac{1}{100}} = \frac{\frac{50}{300}}{1} = \frac{50}{300}$$
$$= \mathbf{\frac{1}{6}}$$

16.

	Percent	Actual Count
Correct	P_C	21
Incorrect	P_I	4
Total	100	25

$$\frac{P_C}{100} = \frac{21}{25}$$
$$25P_C = 2100$$
$$P_C = \mathbf{84\%}$$

17.

	Percent	Actual Count
Left fallow	20	F
Not left fallow	80	N
Total	100	4000

$$\frac{80}{100} = \frac{N}{4000}$$
$$100N = 320{,}000$$
$$N = \mathbf{3200\text{ acres}}$$

18. (a) **Angles *ABC* and *CBD* are supplementary (total 180°), so $m\angle CBD = 40°$.**

(b) **Angles *CBD* and *DBE* are complementary (total 90°), so $m\angle DBE = 50°$.**

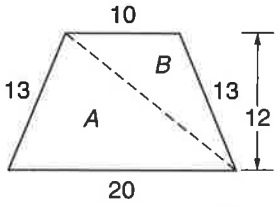
(c) **Angles *DBE* and *EBA* are supplementary (total 180°), so m∠*EBA* = 130°.**

(d) **360°**

19. $\frac{3000}{6300} = \frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot 2 \cdot \overset{1}{\cancel{3}} \cdot \overset{1}{\cancel{5}} \cdot \overset{1}{\cancel{5}} \cdot 5}{\underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{3}} \cdot 3 \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}} \cdot 7}$

$= \mathbf{\frac{10}{21}}$

20. (a)



Area of triangle $A = \frac{(20 \text{ in.})(12 \text{ in.})}{2}$

$= 120 \text{ in.}^2$

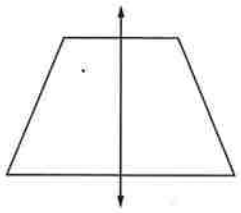
Area of triangle $B = \frac{(10 \text{ in.})(12 \text{ in.})}{2}$

$= 60 \text{ in.}^2$

Area of figure $= 120 \text{ in.}^2 + 60 \text{ in.}^2$

$= \mathbf{180 \text{ in.}^2}$

(b)



21. Double the "in" number, then subtract 1 to find the "out" number.

$4 \cdot 2 - 1 = 7$

$-1 + 1 = 0, 0/2 = \mathbf{0}$

22. (a) $\mathbf{5.6 \times 10^8}$

(b) $\mathbf{5.6 \times 10^{-6}}$

23. $5x = 16.5$

$\frac{5x}{5} = \frac{16.5}{5}$

$x = \mathbf{3.3}$

check: $5(3.3) = 16.5$

$16.5 = 16.5$

24. $3\frac{1}{2} + a = 5\frac{3}{8}$

$3\frac{1}{2} - 3\frac{1}{2} + a = 5\frac{3}{8} - 3\frac{1}{2}$

$a = 5\frac{3}{8} - 3\frac{4}{8}$

$a = 4\frac{11}{8} - 3\frac{4}{8}$

$a = \mathbf{1\frac{7}{8}}$

check: $3\frac{1}{2} + 1\frac{7}{8} = 5\frac{3}{8}$

$3\frac{4}{8} + 1\frac{7}{8} = 5\frac{3}{8}$

$4\frac{11}{8} = 5\frac{3}{8}$

$5\frac{3}{8} = 5\frac{3}{8}$

25. $3^2 + 5[6 - (10 - 2^3)]$

$9 + 5[6 - (10 - 8)]$

$9 + 5[6 - 2]$

$9 + 5[4]$

$9 + 20$

29

26. $\sqrt{2^2 \cdot 3^4 \cdot 5^2} = 2 \cdot 3^2 \cdot 5$

$= 2 \cdot 9 \cdot 5 = \mathbf{90}$

27. $2\frac{2}{3} \times 4\frac{1}{2} \div 6$

$= \left(\frac{\overset{4}{\cancel{8}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{3}{\cancel{9}}}{\underset{1}{\cancel{2}}}\right) \div 6 = 12 \div 6 = \mathbf{2}$ or $\mathbf{\frac{2}{1}}$

28. $(3.5)^2 - (5 - 3.4)$

$= (12.25) - (1.6) = \mathbf{10.65}$

29. (a) **108**

(b) **−75**

(c) **−20**

(d) **−5**

30. (a) $(-3) + |-4| - (-5)$

$(-3) + (4) + [-(-5)]$

$(-3) + (4) + [5]$

6

(b) $(-18) - (+20) + (-7)$

$(-18) + [-(+20)] + (-7)$

$(-18) + [-20] + [-7]$

−45

LESSON 82, LESSON PRACTICE

a. $A = \pi r^2$

$A \approx 3.14(36\ \text{ft}^2)$

$A \approx \mathbf{113\ ft^2}$

b. $A = \pi r^2$

$A \approx 3.14(16\ \text{cm}^2)$

$A \approx \mathbf{50.24\ cm^2}$

c. $A = \pi r^2$

$A = \pi(16\ \text{cm}^2)$

$A = \mathbf{16\pi\ cm^2}$

d. $A = \pi r^2$

$A \approx \frac{22}{7}(16\ \text{cm})^2$

$A \approx \frac{352}{7}\ \text{cm}^2$

$A \approx \mathbf{50\frac{2}{7}\ cm^2}$

LESSON 82, MIXED PRACTICE

1. $(2\ \text{ft})(4\ \text{ft}) = 8\ \text{ft}^2$

$\frac{8\ \text{ft}^2}{1\ \cancel{\text{layer}}}(1\ \text{ft})(2.5\ \cancel{\text{layers}})$

$= \mathbf{20\ ft^3}$

2.

$$\begin{array}{r} 6'\ 3'' = 75'' \\ 6'\ 5'' = 77'' \\ 5'\ 11'' = 71'' \\ 6'\ 2'' = 74'' \\ +\ 6'\ 1'' = 73'' \\ \hline 370'' \end{array}$$

$5\overline{)370''}\quad 74''$

$74'' = \mathbf{6'\ 2''}$

3.

	Ratio	Actual Count
Students	20	S
Teachers	1	48

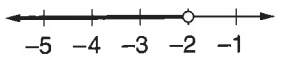
$\frac{20}{1} = \frac{S}{48}$

$S = \mathbf{960\ students}$

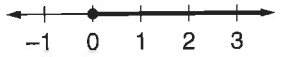
4. $2.54\ \cancel{\text{centimeters}} \cdot \frac{1\ \text{meter}}{100\ \cancel{\text{centimeters}}}$

$= \mathbf{0.0254\ meter}$

5. (a)



(b)



6.

	Case 1	Case 2
Beats	225	b
Minutes	3	5

$\frac{225}{3} = \frac{b}{5}$

$3b = 1125$

$b = \mathbf{375\ times}$

7.

25 students

$\frac{2}{5}$ were boys.	5 students
	5 students
$\frac{3}{5}$ were girls (15).	5 students
	5 students
	5 students

(a) $15 \div 3 = 5$

$5(5\ \text{students}) = \mathbf{25\ students}$

(b) $\frac{\text{girls}}{\text{boys}} = \frac{15}{10} = \mathbf{\frac{3}{2}}$

8. $x^2 - y^2 = 5^2 - 3^2 = 25 - 9 = 16$

$(x + y)(x - y) = (5 + 3)(5 - 3)$

$= (8)(2) = 16, 16 = 16$

$x^2 - y^2 \circledcirc (x + y)(x - y)$

9. Percent unshaded: $25\% + 23\% = \mathbf{48\%}$

Percent shaded: $100\% - 48\% = \mathbf{52\%}$

10. $a \circledless b$

11. (a) $C \approx 3.14\ (14\ \text{cm})$

$C \approx \mathbf{43.96\ cm}$

(b) $C \approx \frac{22}{\cancel{7}_1}(\cancel{14}^2\ \text{cm})$

$C \approx \mathbf{44\ cm}$

12. (a) $A = \pi r^2$

$A \approx 3.14\ (49\ \text{cm}^2)$

$A \approx \mathbf{153.86\ cm^2}$

(b) $A = \pi r^2$

$A \approx \frac{22}{\cancel{7}_1}(\cancel{49}^7\ \text{cm}^2)$

$A \approx \mathbf{154\ cm^2}$

13. (a) $1.6 = 1\frac{6}{10} = \mathbf{1\frac{3}{5}}$

(b) $1.6 \times 100\% = \mathbf{160\%}$

(c) $1.6\% = \frac{1.6}{100} \cdot \frac{10}{10} = \frac{16}{1000} = \mathbf{\frac{2}{125}}$

(d) $1.6\% = \mathbf{0.016}$

14. $M = \mathbf{0.064} \times \mathbf{\$25}$
$M = \mathbf{\$1.60}$

15. (a) $\mathbf{1.2 \times 10^6}$

(b) $\mathbf{1.2 \times 10^{-4}}$

16.

	Percent	Actual Count
Correctly described	64	C
Incorrectly described	36	63
Total	100	T

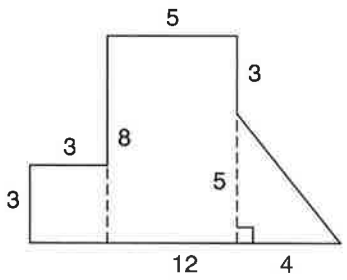
$\frac{64}{36} = \frac{C}{63}$
$36C = 4032$
$C = \mathbf{112\ students}$

17.

	Percent	Actual Count
Pages read	60	180
Pages left to read	40	P
Total	100	T

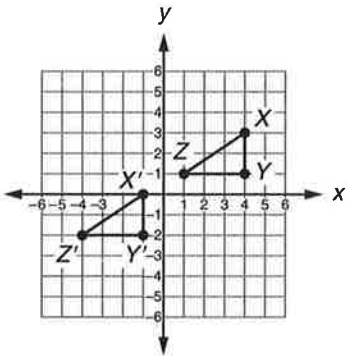
$\frac{60}{40} = \frac{180}{P}$
$60P = 7200$
$P = \mathbf{120\ pages}$

18.



Area of rectangle $= (5\text{ in.})(8\text{ in.}) = 40\text{ in.}^2$
Area of square $= (3\text{ in.})(3\text{ in.}) = 9\text{ in.}^2$
$+$ Area of triangle $= \frac{(5\text{ in.})(4\text{ in.})}{2} = 10\text{ in.}^2$
Area of figure $= \mathbf{59\ in.^2}$

19.



$\mathbf{X'(-1, 0), Y'(-1, -2), Z'(-4, -2)}$

20. $\frac{240}{816} = \frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{3}} \cdot 5}{\underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{3}} \cdot 17}$
$= \mathbf{\frac{5}{17}}$

21. (a) **3 chords**

(b) **6 chords**

(c) **60°**

(d) **120°**

22. $\mathbf{1 \times 10^8}$

23. $\frac{3}{4}x = 36$
$\left(\frac{\overset{1}{\cancel{4}}}{\underset{1}{\cancel{3}}}\right)\frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{4}}}x = \left(\frac{4}{\underset{1}{\cancel{3}}}\right)\overset{12}{\cancel{36}}$
$x = \mathbf{48}$

check: $\frac{3}{\underset{1}{\cancel{4}}}(\overset{12}{\cancel{48}}) = 36$
$3(12) = 36$
$36 = 36$

24. $3.2 + a = 3.46$
$3.2 - 3.2 + a = 3.46 - 3.2$
$a = \mathbf{0.26}$

check: $3.2 + 0.26 = 3.46$
$3.46 = 3.46$

25. $\frac{\sqrt{3^2 + 4^2}}{5} = \frac{\sqrt{9 + 16}}{5}$
$= \frac{\sqrt{25}}{5} = \frac{5}{5} = \mathbf{1}$

26. $(8 - 3)^2 - (3 - 8)^2$
$= (5)^2 - (-5)^2 = 25 - 25 = \mathbf{0}$

27. $3.5 \div (7 \div 0.2)$
$= 3.5 \div 35 = \mathbf{0.1}$

28. $4\frac{1}{2} + 2\frac{2}{3} - 3$

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

$= 6\frac{7}{6} - 2\frac{6}{6} = \mathbf{4\frac{1}{6}}$

29. (a) $\mathbf{-6}$

(b) **24**

30. (a) $(-3) + (-4) - (-2)$

$(-3) + (-4) + [-(-2)]$

$(-3) + (-4) + [2]$

$\mathbf{-5}$

(b) $(-20) + (+30) - |-40|$

$(-20) + (+30) + [-|-40|]$

$(-20) + (+30) + [-40]$

$\mathbf{-30}$

Lesson 83, Lesson Practice

a. $(4.2 \times 1.4) \times (10^6 \times 10^3)$

$= \mathbf{5.88 \times 10^9}$

b. $(5 \times 3) \times (10^5 \times 10^7) = 15 \times 10^{12}$

$= \mathbf{1.5 \times 10^{13}}$

c. $(4 \times 2.1) \times (10^{-3} \times 10^{-7})$

$= \mathbf{8.4 \times 10^{-10}}$

d. $(6 \times 7) \times (10^{-2} \times 10^{-5}) = 42 \times 10^{-7}$

$= \mathbf{4.2 \times 10^{-6}}$

Lesson 83, Mixed Practice

1. $\frac{\$1.12}{16 \text{ ounces}} = \frac{\$0.07}{1 \text{ ounce}}$

$\frac{\$1.32}{24 \text{ ounces}} = \frac{\$0.055}{1 \text{ ounce}}$

$\$0.070$

$- \$0.055$

$0.015 more per ounce

2.

	Ratio	Actual Count
Good apples	5	G
Bad apples	2	B
Total	7	70

$\frac{5}{7} = \frac{G}{70}$

$7G = 350$

$G =$ **50 apples**

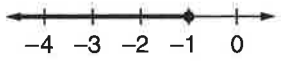
3. $15(82) + 5(90) = 1230 + 450 = 1680$

$$20\overline{)1680}$$
$$\mathbf{84}$$

4. $\$6(2.5) = \mathbf{\$15}$

5. $24 \cancel{\text{shillings}} \cdot \frac{12 \text{ pence}}{1 \cancel{\text{shilling}}} = \mathbf{288 \text{ pence}}$

6.



7.

	Case 1	Case 2
First number	5	20
Second number	12	n

$\frac{5}{12} = \frac{20}{n}$

$5n = 240$

$n =$ **48**

8. $4(1.5) + 5 = 6 + 5 = \mathbf{11}$

9. $\frac{30 \text{ points}}{5} = 6 \text{ points}$

$4(6 \text{ points}) =$ **24 points**

10. $x(x + y) \overset{\text{(=)}}{} x^2 + xy$

11. (a) $C = \pi(28 \text{ cm})$

$C =$ **28π cm**

(b) $C \approx \frac{22}{\cancel{7}_{1}}(\overset{4}{\cancel{28}} \text{ cm})$

$C \approx$ **88 cm**

12. (a) $A = \pi r^2$

$A = \pi(196 \text{ cm}^2)$

$A =$ **196π cm^2**

(b) $A = \pi r^2$

$A \approx \frac{22}{\cancel{7}_{1}}(\overset{28}{\cancel{196}} \text{ cm}^2)$

$A \approx$ **616 cm^2**

13. (a) $(10 \text{ cm})(10 \text{ cm}) = 100 \text{ cm}^2$

$(100 \text{ cm}^2)(10 \text{ cm}) =$ **1000 cm^3**

(b) $6(100 \text{ cm}^2) =$ **600 cm^2**

14. (a) $250\% = \frac{250}{100} = 2\frac{50}{100} = \mathbf{2\frac{1}{2}}$

(b) $250\% = \frac{250}{100} =$ **2.5**

(c) $12\overline{)7.0000}$ $= 0.58\overline{3}$

$$\begin{array}{r} 0.5833\ldots \\ 12\overline{)7.0000} \\ \underline{60} \\ 100 \\ \underline{96} \\ 40 \\ \underline{36} \\ 40 \\ \underline{36} \\ 4 \end{array}$$

(d) $\frac{7}{12} \times 100\% = \frac{700\%}{12} = \mathbf{58\frac{1}{3}\%}$

$$\begin{array}{r} 58\frac{4}{12} = 58\frac{1}{3}\% \\ 12\overline{)700} \\ \underline{60} \\ 100 \\ \underline{96} \\ 4 \end{array}$$

15.
$$\begin{array}{r} \$8.50 \\ \times\ 0.065 \\ \hline \$0.5525 \end{array} \longrightarrow \mathbf{\$0.55}$$

16.

	Percent	Actual Count
Commercial time	P_C	12
Other	P_O	48
Total	100	60

$$\frac{P_C}{100} = \frac{12}{60}$$
$$60P_C = 1200$$
$$P_C = \mathbf{20\%}$$

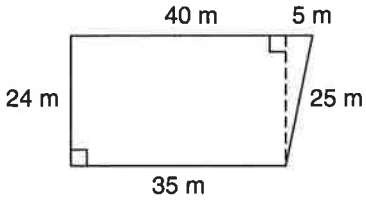
17.

	Percent	Actual Count
Steam-powered	30	S
Not steam-powered	70	42
Total	100	T

$$\frac{70}{100} = \frac{42}{T}$$
$$70T = 4200$$
$$T = \mathbf{60\ boats}$$

18. $\frac{420}{630} = \frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{3}} \cdot \overset{1}{\cancel{5}} \cdot \overset{1}{\cancel{7}}}{\underset{1}{\cancel{2}} \cdot 3 \cdot \underset{1}{\cancel{3}} \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{7}}} = \mathbf{\frac{2}{3}}$

19.



Area of rectangle $= (35\text{ m})(24\text{ m})$
$= 840\text{ m}^2$

Area of triangle $= \frac{(24\text{ m})(5\text{ m})}{2}$
$= 60\text{ m}^2$

Area of figure $= 840\text{ m}^2 + 60\text{ m}^2$
$= \mathbf{900\ m^2}$

20. (a) $m\angle ECD = 180° - (90° + 54°)$
$= 180° - 144° = \mathbf{36°}$

(b) $m\angle ECB = 180° - 36° = \mathbf{144°}$

(c) $m\angle ACB = m\angle ECD = \mathbf{36°}$

(d) $m\angle BAC = \frac{180° - 36°}{2} = \frac{144°}{2} = \mathbf{72°}$

21. **Multiply the "in" number by 2; then add 1 to find the "out" number.**

$21 - 1 = 20, \frac{20}{2} = \mathbf{10}$

$-5(2) + 1 = -10 + 1 = \mathbf{-9}$

22. (a) $(3 \times 6) \times (10^4 \times 10^5) = 18 \times 10^9$
$= \mathbf{1.8 \times 10^{10}}$

(b) $(1.2 \times 4) \times (10^{-3} \times 10^{-6})$
$= \mathbf{4.8 \times 10^{-9}}$

23. $b - 1\frac{2}{3} = 4\frac{1}{2}$

$b - 1\frac{2}{3} + 1\frac{2}{3} = 4\frac{1}{2} + 1\frac{2}{3}$

$b = 4\frac{3}{6} + 1\frac{4}{6}$

$b = 5\frac{7}{6}$

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

check: $6\frac{1}{6} - 1\frac{2}{3} = 4\frac{1}{2}$

$6\frac{1}{6} - 1\frac{4}{6} = 4\frac{1}{2}$

$5\frac{7}{6} - 1\frac{4}{6} = 4\frac{1}{2}$

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

$4\frac{1}{2} = 4\frac{1}{2}$

24. $0.4y = 1.44$

$$\frac{0.4y}{0.4} = \frac{1.44}{0.4}$$

$$y = \mathbf{3.6}$$

check: $0.4(3.6) = 1.44$

$1.44 = 1.44$

25. $2^3 + 2^2 + 2^1 + 2^0 + 2^{-1}$

$= 8 + 4 + 2 + 1 + \frac{1}{2} = \mathbf{15\frac{1}{2}}$

26. $\frac{6}{10} \times 3\frac{1}{3} \div 2$

$= \left(\frac{6}{10} \times \frac{10}{3}\right) \div 2 = 2 \div 2 = \mathbf{1}$

27. (a) **4**

(b) **−60**

28.
$$\frac{5}{24} = \frac{25}{120}$$
$$-\frac{7}{60} = \frac{14}{120}$$
$$\frac{\mathbf{11}}{\mathbf{120}}$$

29. (a) $(-3) + (-4) - (-5)$

$(-3) + (-4) + [-(-5)]$

$(-3) + (-4) + [5]$

−2

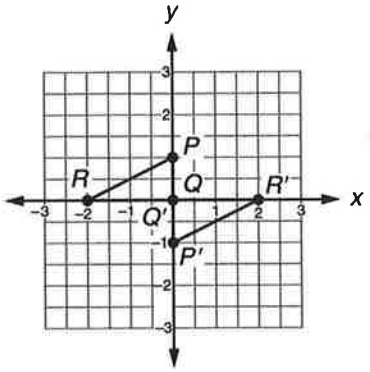
(b) $(-15) - (+14) + (+10)$

$(-15) + [-(+14)] + (+10)$

$(-15) + [-14] + (+10)$

−19

30.



***P'*(0, −1), *Q'*(0, 0), *R'*(2, 0)**

LESSON 84, LESSON PRACTICE

a. Binomial

b. Trinomial

c. Monomial

d. Binomial

e. $3a + 2a^2 - a + a^2$

$2a^2 + a^2 + 3a - a$

$\mathbf{3a^2 + 2a}$

f. $5xy - x + xy - 2x$

$5xy + xy - x - 2x$

$\mathbf{6xy - 3x}$

g. $3 + x^2 + x - 5 + 2x^2$

$x^2 + 2x^2 + x + 3 - 5$

$\mathbf{3x^2 + x - 2}$

h. $3\pi + 1.4 - \pi + 2.8$

$3\pi - \pi + 1.4 + 2.8$

$\mathbf{2\pi + 4.2}$

LESSON 84, MIXED PRACTICE

1. 18°F

2. $2xy + xy - 3x + x$

$\mathbf{3xy - 2x}$

3. (a) 79°F − 68°F = **11°F**

(b) **Thursday**

(c)
$$\begin{array}{r} 68°F \\ 72°F \\ 70°F \\ 76°F \\ +\ 79°F \\ \hline 365°F \end{array} \qquad 5\overline{)365°F} \quad 73°F$$

73°F − 70°F = **3°F**

4. (a)
$$\begin{array}{r} 90 \\ 90 \\ 100 \\ 95 \\ 95 \\ 85 \\ 100 \\ 100 \\ 80 \\ +\ 100 \\ \hline 935 \end{array} \qquad 10\overline{)935.0} \quad \mathbf{93.5}$$

(b) **95**

(c) **100**

(d) $100 - 80 = \mathbf{20}$

5.

	Ratio	Actual Count
Rowboats	3	R
Sailboats	7	S
Total	10	210

$$\frac{7}{10} = \frac{S}{210}$$
$$10S = 1470$$
$$S = \mathbf{147 \text{ sailboats}}$$

6. **2nd**

7. $\frac{\$1.40}{4} = \frac{c}{10}$

$$4c = \$14$$
$$c = \mathbf{\$3.50}$$

8. $36 \div 3 = 12$

$5(12 \text{ members}) = \mathbf{60 \text{ members}}$

9. (a) $(5)^2 - 2(5) + 1 = 25 - 10 + 1$
$= \mathbf{16}$

(b) $(5 - 1)^2 = (4)^2 = \mathbf{16}$

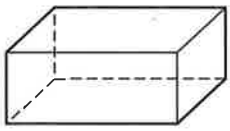
10. $f \circledcirc g$

11. (a) $C \approx 3.14(6 \text{ in.})$
$C \approx \mathbf{18.84 \text{ in.}}$

(b) $A = \pi r^2$
$A \approx 3.14(9 \text{ in.}^2)$
$A \approx \mathbf{28.26 \text{ in.}^2}$

12. $\mathbf{4.8 \cancel{\text{ meters}} \cdot \frac{100 \text{ centimeters}}{1 \cancel{\text{ meter}}}}$
$= \mathbf{480 \text{ centimeters}}$

13.



6 faces

14. (a) $1\frac{4}{5} = 1\frac{8}{10} = \mathbf{1.8}$

(b) $1.8 \times 100\% = \mathbf{180\%}$

(c) $1.8\% = \frac{1.8}{100} \cdot \frac{10}{10} = \frac{18}{1000} = \mathbf{\frac{9}{500}}$

(d) $1.8\% = \mathbf{0.018}$

15. $p = 0.3 \times \$18.00$
$p = \mathbf{\$5.40}$

16. $\frac{12\frac{1}{2}}{100} = \frac{\frac{25}{2}}{\frac{100}{1}}$

$$\frac{\frac{25}{2}}{\frac{100}{1}} \cdot \frac{\frac{1}{100}}{\frac{1}{100}} = \frac{\frac{25}{200}}{1} = \frac{25}{200}$$
$$= \mathbf{\frac{1}{8}}$$

17.

	Percent	Actual Count
Flew the coop	40	36
Stayed	60	S
Total	100	T

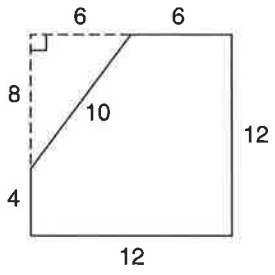
$$\frac{40}{100} = \frac{36}{T}$$
$$40T = 3600$$
$$T = \mathbf{90 \text{ pigeons}}$$

18.

	Percent	Actual Count
3 feet tall or less	60	L
More than 3 feet tall	40	M
Total	100	300

$$\frac{40}{100} = \frac{M}{300}$$
$$100M = 12{,}000$$
$$M = \mathbf{120 \text{ saplings}}$$

19.



(a) Perimeter $= 12 \text{ in.} + 12 \text{ in.} + 4 \text{ in.}$
$+ 10 \text{ in.} + 6 \text{ in.}$
$= \mathbf{44 \text{ in.}}$

(b) Area of square $= (12 \text{ in.})(12 \text{ in.})$
$= 144 \text{ in.}^2$

Area of triangle $= \frac{(6 \text{ in.})(8 \text{ in.})}{2}$
$= 24 \text{ in.}^2$

Area of figure $= 144 \text{ in.}^2 - 24 \text{ in.}^2$
$= \mathbf{120 \text{ in.}^2}$

20. (a) $\frac{60°}{360°}$ $\quad \mathbf{\frac{1}{6}}$

(b) $\frac{45°}{360°}$ $\quad \mathbf{\frac{1}{8}}$

(c) $\frac{75°}{360°}$ $\quad \mathbf{\frac{5}{24}}$

21. **To find a term in the sequence, double the preceding term and add 1.**

Note: **Other rule descriptions are possible, including "The value of the nth term is $2^n - 1$." Discuss various rules proposed by students.**

$31 \times 2 + 1 = \mathbf{63}$
$63 \times 2 + 1 = \mathbf{127}$
$127 \times 2 + 1 = \mathbf{255}$

22. (a) $(1.5 \times 3) \times (10^{-3} \times 10^{6})$
$= \mathbf{4.5 \times 10^{3}}$

(b) $(3 \times 5) \times (10^{4} \times 10^{5}) = 15 \times 10^{9}$
$= \mathbf{1.5 \times 10^{10}}$

23. (a) 10^{6}

(b) 10^{-4}

24.
$$b - 4.75 = 5.2$$
$$b - 4.75 + 4.75 = 5.2 + 4.75$$
$$b = \mathbf{9.95}$$
check: $9.95 - 4.75 = 5.2$
$5.2 = 5.2$

25.
$$\frac{2}{3}y = 36$$
$$\left(\frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{2}}}\right)\left(\frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}}\right)y = \left(\frac{\overset{18}{\cancel{3}}}{\underset{1}{\cancel{2}}}\right)\cancel{36}$$
$$y = \mathbf{54}$$
check: $\frac{2}{\cancel{3}}(\overset{18}{\cancel{54}}) = 36$
$2(18) = 36$
$36 = 36$

26. $\sqrt{5^2 - 4^2} + 2^3$
$= \sqrt{25 - 16} + 8 = \sqrt{9} + 8$
$= 3 + 8 = \mathbf{11}$

27. $1 \text{ m} = 1000 \text{ mm}$
$1000 \text{ mm} - 45 \text{ mm} = \mathbf{955 \text{ mm}}$

28. $0.9 \div 2.25 \times 24 = 0.4 \times 24 = \mathbf{9.6}$

29. (a) **4**

(b) **−30**

30. (a) $(+30) - (-50) - (+20)$
$(+30) + [-(-50)] + [-(+20)]$
$(+30) + [50] + [-20]$
60

(b) $(-3) - (-4) - (5)$
$(-3) + [-(-4)] + [-(5)]$
$(-3) + [4] + [-5]$
−4

LESSON 85, LESSON PRACTICE

a. $(-3) + (-3)(-3) - \frac{(-3)}{(+3)}$
$(-3) + 9 - (-1)$
$(-3) + 9 + [-(-1)]$
$(-3) + 9 + [1]$
7

b. $(-3) - [(-4) - (-5)(-6)]$
$(-3) - [(-4) - (+30)]$
$(-3) - [-34]$
$(-3) + 34$
31

c. $(-2)[(-3) - (-4)(-5)]$
$(-2)[(-3) - (+20)]$
$(-2)[-23]$
46

d. $(-5) - (-5)(-5) + |-5|$
$(-5) - (+25) + 5$
$(-5) + [-(+25)] + 5$
$(-5) + [-25] + 5$
−25

e. $y = 3(3) - 1$
$y = 9 - 1$
$y = \mathbf{8}$;
$y = 3(1) - 1$
$y = 3 - 1$
$y = \mathbf{2}$;
$y = 3(0) - 1$
$y = 0 - 1$
$y = \mathbf{-1}$

f. $y = \frac{1}{2}x;$

$y = \frac{1}{2}(6)$

$y = \mathbf{3};$

$y = \frac{1}{2}(0)$

$y = \mathbf{0};$

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

$\left(\frac{2}{1}\right)4 = \left(\frac{2}{1}\right)\left(\frac{1}{2}\right)x$

$\mathbf{8} = x$

g. $y = 8 - x$

$y = 8 - 7$

$y = \mathbf{1};$

$y = 8 - 1$

$y = \mathbf{7};$

$y = 8 - 4$

$y = \mathbf{4}$

h. $y = x^2$

x	y
1	**1**
2	**4**
3	**9**

LESSON 85, MIXED PRACTICE

1. (a)

$$\begin{array}{r} 70 \\ 80 \\ 90 \\ 80 \\ 70 \\ 90 \\ 75 \\ 95 \\ 100 \\ +\ 90 \\ \hline 840 \end{array} \qquad 10\overline{)840} = \mathbf{84}$$

(b) **85**

(c) **90**

(d) **30**

2.

	Ratio	Actual Count
Won	3	W
Lost	1	L
Total	4	24

$\frac{1}{4} = \frac{L}{24}$

$4L = 24$

$L =$ **6 games**

3.

	Ratio	Actual Count
Dandelions	11	D
Marigolds	4	44

$\frac{11}{4} = \frac{D}{44}$

$4D = 484$

$D =$ **121 dandelions**

4.

	Case 1	Case 2
Miles	2	m
Seconds	10	60

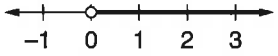
$\frac{2}{10} = \frac{m}{60}$

$10m = 120$

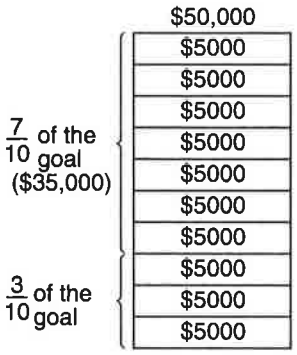
$m =$ **12 miles**

5. $\mathbf{0.98\ \cancel{liter} \cdot \frac{1000\ milliliters}{1\ \cancel{liter}} = 980\ milliliters}$

6.



7.



(a) $\frac{\$35{,}000}{7} = \$5000$

$10 \times \$5000 =$ **$50,000**

(b) **30%**

8. Insufficient information

9. (a) $C \approx 3.14\,(8\text{ m})$

$C \approx$ **25.12 m**

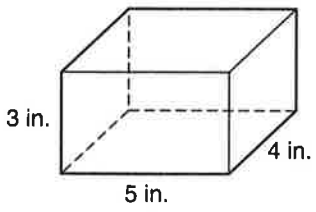
(b) $A = \pi r^2$

$A \approx 3.14\,(16\text{ m}^2)$

$A \approx$ **50.24 m^2**

10. $1 - \frac{8}{20} - \frac{5}{20} = \mathbf{\frac{7}{20}}$

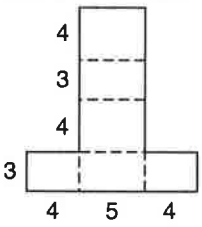
11.



$$(5 \text{ in.})(4 \text{ in.}) = 20 \text{ in.}^2$$

$$\frac{20 \text{ in.}^2}{1 \cancel{\text{layer}}} \cdot 1 \text{ in.}(3 \cancel{\text{layers}}) = \mathbf{60 \text{ in.}^3}$$

12. **One possibility:**



$$2(15 \text{ in.}^2) + 2(20 \text{ in.}^2) + 2(12 \text{ in.}^2)$$
$$= 30 \text{ in.}^2 + 40 \text{ in.}^2 + 24 \text{ in.}^2$$
$$= \mathbf{94 \text{ in.}^2}$$

13. (a) $\frac{1}{40} \cdot \frac{25}{25} = \frac{25}{1000} = 0.025$

(b) $\frac{1}{40} \times 100\% = \frac{100\%}{40} = \mathbf{2\frac{1}{2}\%}$

$$40\overline{)100} \quad 2\tfrac{20}{40} = 2\tfrac{1}{2}\%$$
$$\underline{80}$$
$$20$$

(c) $0.25\% = \frac{0.25}{100} \cdot \frac{100}{100} = \frac{25}{10{,}000} = \mathbf{\frac{1}{400}}$

(d) $0.25\% = \mathbf{0.0025}$

14.
$$\begin{array}{r} \$180{,}000 \\ \times \quad 0.06 \\ \hline \mathbf{\$10{,}800} \end{array}$$

15. (a) $\mathbf{2^3 \cdot 3^2 \cdot 5 \cdot 7^2}$

(b) **The exponents of the prime factors of 17,640 are not all even numbers.**

16.
$$\frac{8\frac{1}{3}}{100} = \frac{\frac{25}{3}}{\frac{100}{1}}$$

$$\frac{\frac{25}{3}}{\frac{100}{1}} \cdot \frac{\frac{1}{100}}{\frac{1}{100}} = \frac{\frac{25}{300}}{1} = \frac{25}{300}$$
$$= \mathbf{\frac{1}{12}}$$

17.

	Percent	Actual Count
Correct	P_C	38
Incorrect	P_I	2
Total	100	40

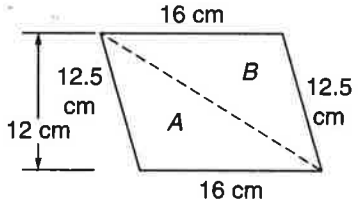
$$\frac{P_C}{100} = \frac{38}{40}$$
$$40P_C = 3800$$
$$P_C = \mathbf{95\%}$$

18.

	Percent	Actual Count
Happy faces	35	H
Not happy faces	65	91
Total	100	T

$$\frac{65}{100} = \frac{91}{T}$$
$$65T = 9100$$
$$T = \mathbf{140 \text{ children}}$$

19.

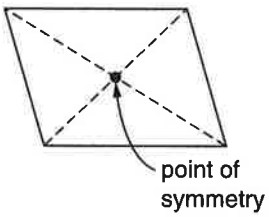


(a) **Parallelogram**

(b) Perimeter = 12.5 cm + 16 cm + 12.5 cm + 16 cm = **57 cm**

(c) Area = (12 cm)(16 cm) = **192 cm²**

(d)



20. (a) $m\angle TOS = \mathbf{90°}$

(b) $m\angle QOT = \mathbf{180°}$

(c) $m\angle QOR = \frac{90°}{3} = \mathbf{30°}$

(d) $m\angle TOR = 90° + 60° = \mathbf{150°}$

21.
$$y = 2(5) - 1$$
$$y = 10 - 1$$
$$y = \mathbf{9};$$
$$y = 2(3) - 1$$
$$y = 6 - 1$$
$$y = \mathbf{5};$$
$$y = 2(1) - 1$$
$$y = 2 - 1$$
$$y = \mathbf{1}$$

22. $30 \times 10^5 = (5 \times 10^{-3})(6 \times 10^8)$
$= (5 \times 10^8)(6 \times 10^{-3})$

23. $13.2 = 1.2w$
$\frac{13.2}{1.2} = \frac{1.2w}{1.2}$
$\mathbf{11} = w$

check: $13.2 = 1.2(11)$
$13.2 = 13.2$

24. $c + \frac{5}{6} = 1\frac{1}{4}$
$c + \frac{5}{6} - \frac{5}{6} = 1\frac{1}{4} - \frac{5}{6}$
$c = 1\frac{3}{12} - \frac{10}{12}$
$c = \frac{15}{12} - \frac{10}{12}$
$c = \mathbf{\frac{5}{12}}$

check: $\frac{5}{12} + \frac{5}{6} = 1\frac{1}{4}$
$\frac{5}{12} + \frac{10}{12} = 1\frac{1}{4}$
$\frac{15}{12} = 1\frac{1}{4}$
$1\frac{3}{12} = 1\frac{1}{4}$
$1\frac{1}{4} = 1\frac{1}{4}$

25. $3\{20 - [6^2 - 3(10 - 4)]\}$
$3\{20 - [36 - 3(6)]\}$
$3\{20 - [36 - 18]\}$
$3\{20 - [18]\}$
$3\{2\}$
$\mathbf{6}$

26. (60 min) (60 s)

$$\begin{array}{r} \overset{2}{\cancel{3}}\text{ hr } \overset{14}{\cancel{15}}\text{ min } 25\text{ s} \\ -\ 2\text{ hr } 45\text{ min } 30\text{ s} \end{array} \longrightarrow$$

$$\begin{array}{r} \overset{2}{\cancel{3}}\text{ hr } \overset{74}{\cancel{15}}\text{ min } \overset{85}{\cancel{25}}\text{ s} \\ -\ 2\text{ hr } 45\text{ min } 30\text{ s} \\ \hline \mathbf{29\text{ min } 55\text{ s}} \end{array}$$

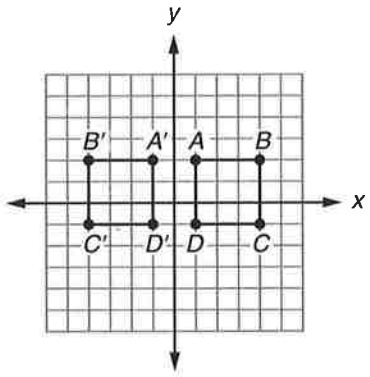
27. $1 + 0.2 + 0.25 = \mathbf{1.45}$

28. (a) $(-2) + (-2)(+2) - \frac{(-2)}{(-2)}$
$(-2) + (-4) - 1$
$(-2) + (-4) + [-(1)]$
$(-2) - (-4) + (-1)$
-7

(b) $(-3) - [(-2) - (+4)(-5)]$
$(-3) - [(-2) - (-20)]$
$(-3) - [(-2) + 20]$
$(-3) - [18]$
$(-3) + [-(18)]$
$(-3) + (-18)$
$\mathbf{-21}$

29. $x^2 + 6x - 2x - 12$
$\mathbf{x^2 + 4x - 12}$

30. (a) $\boldsymbol{D(1, -1)}$



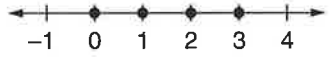
(b) $\boldsymbol{A'(-1, 2), B'(-4, 2),}$
$\boldsymbol{C'(-4, -1), D'(-1, -1)}$

Lesson 86, Lesson Practice

a.



b.



c. False

d. True

Lesson 86, Mixed Practice

1. $\frac{\$28.50}{3\text{ ounces}} = \frac{\$9.50}{1\text{ ounce}}$
$\frac{\$4.96}{8\text{ ounces}} = \frac{\$0.62}{1\text{ ounce}}$

$$\begin{array}{r} \$9.50 \\ -\ \$0.62 \\ \hline \end{array}$$

$8.88 more per ounce