18.
$$\begin{array}{r} 45^\circ \\ 8\overline{)360^\circ} \\ \underline{32} \\ 40 \\ \underline{40} \\ 0 \end{array}$$
$n = \mathbf{45^\circ}$

19. $1^3 = 1 \cdot 1 \cdot 1 = 1, \frac{3}{4}$

$m = \mathbf{\frac{3}{4}}$

20. $6\frac{1}{6} + 1\frac{5}{6} = 7\frac{6}{6} = \mathbf{8}$

21. $\frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{4}}} \cdot \frac{\overset{1}{\cancel{5}}}{\underset{3}{\cancel{9}}} \cdot \frac{\overset{2}{\cancel{8}}}{\underset{3}{\cancel{15}}} = \mathbf{\frac{2}{9}}$

22. $1 \div \frac{2}{1} = \frac{1}{2}$

$\frac{4}{5} \div \frac{2}{1} = \frac{\overset{2}{\cancel{4}}}{5} \times \frac{1}{\underset{1}{\cancel{2}}} = \mathbf{\frac{2}{5}}$

23. $1 \div \frac{6}{5} = \frac{5}{6}$

$\frac{8}{5} \div \frac{6}{5} = \frac{\overset{4}{\cancel{8}}}{\underset{1}{\cancel{5}}} \times \frac{\overset{1}{\cancel{5}}}{\underset{3}{\cancel{6}}} = \frac{4}{3} = \mathbf{1\frac{1}{3}}$

24. $1 \div \frac{5}{6} = \frac{6}{5}$

$\frac{3}{7} \div \frac{5}{6} = \frac{3}{7} \times \frac{6}{5} = \mathbf{\frac{18}{35}}$

25.
$$\begin{array}{r} 12 \\ 8\overline{)100} \\ \underline{8} \\ 20 \\ \underline{16} \\ 4 \\ \underline{0} \\ 4 \end{array}$$
$12\frac{4}{8}\% = \mathbf{12\frac{1}{2}\%}$

26. $\mathbf{\frac{5}{3}}$

27. (a) $2^2 \cdot 2^3 = 4 \cdot 8$

$\mathbf{4 \cdot 8 = 8 \cdot 4}$ or

$\mathbf{32 = 32}$

(b) **2**

28. Perimeter = 6 inches + 6 inches + 6 inches + 6 inches + 6 inches + 6 inches = 36 inches

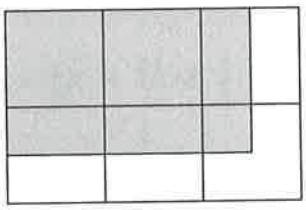
36 inches ÷ 12 = **3 feet**

29. Perimeter = 4 in. + 2 in. + 2 in. + 2 in. + 2 in. + 4 in. = **16 in.**

30. Third prime number = 5, **−5**

LESSON 26, LESSON PRACTICE

a.



Area $= 2 \text{ in.}^2 + \frac{3}{2} \text{ in.}^2 + \frac{1}{4} \text{ in.}^2$

$= 2 \text{ in.}^2 + \frac{6}{4} \text{ in.}^2 + \frac{1}{4} \text{ in.}^2$

$= 2\frac{7}{4} \text{ in.}^2 = \mathbf{3\frac{3}{4} \text{ in.}^2}$

check: $1\frac{1}{2} \text{ in.} \times 2\frac{1}{2} \text{ in.}$

$= \frac{3}{2} \text{ in.} \times \frac{5}{2} \text{ in.} = \frac{15}{4} \text{ in.}^2$

$= 3\frac{3}{4} \text{ in.}^2$

b. $6\frac{2}{3} \times \frac{3}{5} = \frac{\overset{4}{\cancel{20}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{5}}} = \mathbf{4}$

c. $2\frac{1}{3} \times 3\frac{1}{2} = \frac{7}{3} \times \frac{7}{2} = \frac{49}{6} = \mathbf{8\frac{1}{6}}$

d. $3 \times 3\frac{3}{4} = \frac{3}{1} \times \frac{15}{4} = \frac{45}{4} = \mathbf{11\frac{1}{4}}$

e. $1\frac{2}{3} \div 3 = 1\frac{2}{3} \times \frac{1}{3} = \frac{5}{3} \times \frac{1}{3} = \mathbf{\frac{5}{9}}$

f. $2\frac{1}{2} \div 3\frac{1}{3} = \frac{5}{2} \div \frac{10}{3}$

$= \frac{\overset{1}{\cancel{5}}}{2} \times \frac{3}{\underset{2}{\cancel{10}}} = \mathbf{\frac{3}{4}}$

g. $5 \div \frac{2}{3} = \frac{5}{1} \times \frac{3}{2} = \frac{15}{2} = \mathbf{7\frac{1}{2}}$

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

$= \frac{\overset{2}{\cancel{8}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{4}}} = \mathbf{2}$

i. $1\frac{1}{3} \div 2\frac{2}{3} = \frac{4}{3} \div \frac{8}{3} = \frac{\overset{1}{\cancel{4}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{8}}} = \mathbf{\frac{1}{2}}$

j. $4\frac{1}{2} \times 1\frac{2}{3} = \frac{\overset{3}{\cancel{9}}}{2} \times \frac{5}{\underset{1}{\cancel{3}}} = \frac{15}{2} = \mathbf{7\frac{1}{2}}$

LESSON 26, MIXED PRACTICE

1. $23 + M = 61$

61 millimeters
− 23 millimeters
38 millimeters

2. $26 \times 85¢ = T$

$0.85
× 26
510
170
$22.10

3. $1453 - 330 = B$

1453
− 330
1123

1123 years

4. $\$20.00 - S = \$11.25$

$20.00
− $11.25
$8.75

5. $12 \times 12 = P$

12
× 12
24
12
144

144 pencils

6.

60 marbles

$\frac{2}{5}$ were blue.	12 marbles
	12 marbles
$\frac{3}{5}$ were not blue.	12 marbles
	12 marbles
	12 marbles

$40\% = \frac{40}{100} \div \frac{20}{20} = \mathbf{\frac{2}{5}}$

(a) 2×12 marbles = **24 marbles**

(b) 3×12 marbles = **36 marbles**

7. 1 ton = 2000 pounds

$\frac{\overset{500}{\cancel{2000}} \text{ pounds}}{\underset{1}{\cancel{4}}} =$ **500 pounds**

8. (a) $\mathbf{\frac{3}{100}}$

(b) $\frac{97}{100} = \mathbf{97\%}$

9. (a) $210 = 2 \cdot 3 \cdot 5 \cdot 7$

$252 = 2 \cdot 2 \cdot 3 \cdot 3 \cdot 7$

$\frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{3}} \cdot 5 \cdot \overset{1}{\cancel{7}}}{\underset{1}{\cancel{2}} \cdot 2 \cdot \underset{1}{\cancel{3}} \cdot 3 \cdot \underset{1}{\cancel{7}}} = \mathbf{\frac{5}{6}}$

(b) GCF $= 2 \cdot 3 \cdot 7 =$ **42**

10. (a) $\mathbf{\frac{9}{5}}$

(b) $\mathbf{\frac{4}{23}}$

(c) $\mathbf{\frac{1}{7}}$

11. (a) $\frac{5}{8} \cdot \frac{3}{3} = \mathbf{\frac{15}{24}}$

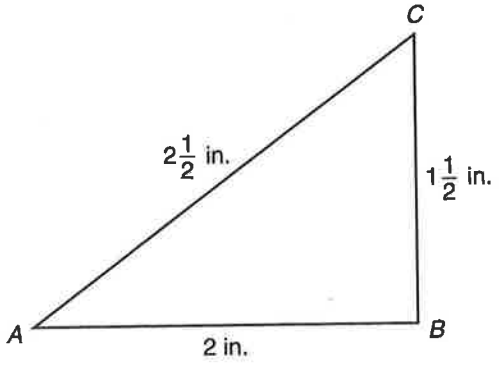
(b) $\frac{5}{12} \cdot \frac{2}{2} = \mathbf{\frac{10}{24}}$

(c) $\frac{15}{24} + \frac{10}{24} = \frac{25}{24} = \mathbf{1\frac{1}{24}}$

12. **Check polygon for 7 sides; one possibility:**



13.



$AC = \mathbf{2\frac{1}{2}\ in.}$

14. (a) $\mathbf{-3,\ 0,\ \frac{5}{6},\ 1,\ \frac{4}{3}}$

(b) **0, 1**

15. $6\frac{5}{12} + 8\frac{11}{12} = 14\frac{16}{12} = 15\frac{4}{12}$

$x = \mathbf{15\frac{1}{3}}$

16.
$$\begin{array}{r} 180 \\ -\ 75 \\ \hline 105 \end{array}$$

$y = \mathbf{105}$

17.
$$\begin{array}{r} 30^\circ \\ 12\overline{)360^\circ} \\ \underline{36} \\ 00 \\ \underline{0} \\ 0 \end{array}$$

$w = \mathbf{30^\circ}$

18.
$$\begin{array}{r} 100 \\ -\ 58\frac{1}{3} \\ \hline \end{array} \longrightarrow \begin{array}{r} 99\frac{3}{3} \\ -\ 58\frac{1}{3} \\ \hline \end{array}$$

$w = \mathbf{41\frac{2}{3}}$

19. (a) Area $= 10\text{ in.} \times 10\text{ in.}$
$= \mathbf{100\ in.^2}$

(b) $\frac{100\text{ in.}^2}{2} = \mathbf{50\ in.^2}$

20. $9\frac{1}{9} \xrightarrow{8 + \frac{9}{9} + \frac{1}{9}} 8\frac{10}{9}$

$$\begin{array}{r} 8\frac{10}{9} \\ -\ 4\frac{4}{9} \\ \hline 4\frac{6}{9} \end{array}$$

$4\frac{6}{9} = \mathbf{4\frac{2}{3}}$

21. $\frac{\cancel{8}^{1}}{8} \cdot \frac{\cancel{8}^{1}}{\cancel{10}_{2}} \cdot \frac{1}{\cancel{8}_{2}} = \mathbf{\frac{1}{32}}$

22. $\left(2\frac{1}{2}\right)^2 = 2\frac{1}{2} \times 2\frac{1}{2}$

$= \frac{5}{2} \times \frac{5}{2} = \frac{25}{4} = \mathbf{6\frac{1}{4}}$

23. $1\frac{3}{5} \div 2\frac{2}{3}$

$= \frac{8}{5} \div \frac{8}{3} = \frac{\cancel{8}^{1}}{5} \times \frac{3}{\cancel{8}_{1}} = \mathbf{\frac{3}{5}}$

24. $3\frac{1}{3} \div 4 = \frac{10}{3} \div \frac{4}{1}$

$= \frac{\cancel{10}^{5}}{3} \times \frac{1}{\cancel{4}_{2}} = \mathbf{\frac{5}{6}}$

25. $5 \cdot 1\frac{3}{4} = \frac{5}{1} \times \frac{7}{4} = \frac{35}{4}$

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

26. $\sqrt{10^2 \cdot 10^4}$
$= \sqrt{10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10}$
$= \sqrt{1{,}000{,}000} =$ **1000** or $\mathbf{10^3}$

27.
$$\begin{array}{r} 459 \\ 36\overline{)16{,}524} \\ 144 \\ \hline 212 \\ 180 \\ \hline 324 \\ 324 \\ \hline 0 \end{array}$$

28. (a) $3 - \frac{6}{3} = 3 - 2 = \mathbf{1}$

(b) $\frac{3 \cdot \cancel{6}^{1}}{\cancel{6}_{1}} = \mathbf{3}$

(c) $\frac{\cancel{3}^{1}}{\cancel{6}_{1}} \cdot \frac{\cancel{6}^{1}}{\cancel{3}_{1}} = \mathbf{1}$

29. $k = 3(9) - 2 = 27 - 2 = \mathbf{25}$

30. $\frac{1}{2} \times 90° = \frac{90°}{2} = \mathbf{45°}$

Lesson 27, Lesson Practice

a. 8, 16, 24, 32, (40), 48, . . .
10, 20, 30, (40), 50, . . .
LCM (8, 10) = **40**

b.
$4 = 2 \cdot 2$
$6 = 2 \cdot 3$
$10 = 2 \cdot 5$
LCM (4, 6, 10) $= 2 \cdot 2 \cdot 3 \cdot 5 = 4 \cdot 15$
$=$ **60**

c.
$24 = 2 \cdot 2 \cdot 2 \cdot 3$
$40 = 2 \cdot 2 \cdot 2 \cdot 5$
LCM (24, 40) $= 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5$
$= 24 \cdot 5 =$ **120**

d.
$30 = 2 \cdot 3 \cdot 5$
$75 = 3 \cdot 5 \cdot 5$
LCM (30, 75) $= 2 \cdot 3 \cdot 5 \cdot 5$
$=$ **150**

e. $\left(7\frac{1}{2}\right)2 = 15$; $\left(1\frac{1}{2}\right)2 = 3$
$15 \div 3 =$ **5**

f.–h. See student work. Sample answers:

f. $240 \div 4 =$ **60**

g. $\frac{\$6.00 \div 6}{12 \div 6} = \frac{\$1.00}{2} =$ **50¢**

h. $280 \div 10 =$ **28**

Lesson 27, Mixed Practice

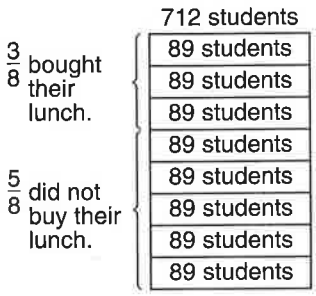
1. **11,460 + 9420 + 8916 = *P***
$$\begin{array}{r} 11{,}460 \\ 9420 \\ +\ 8916 \\ \hline \mathbf{29{,}796} \end{array}$$

2. **6 · 12 = *I***
$$\begin{array}{r} 12 \\ \times\ 6 \\ \hline 72 \end{array}$$
72 inches

3. **$0.15 per egg; Some equivalent division problems:**
$0.90 ÷ 6 = $0.15
$0.60 ÷ 4 = $0.15
$0.45 ÷ 3 = $0.15
$0.30 ÷ 2 = $0.15

4. **C. 10^9**

5.



(a) 3 × 89 students = **267 students**

(b) 5 × 89 students = **445 students**

6. (a) 30 in. − 6 in. − 6 in.
= 18 in.
18 in. ÷ 2 = **9 in.**

(b) Area = 6 in. × 9 in. = **54 in.²**

7.
$$\begin{aligned} 25 &= 5 \cdot 5 \\ 45 &= 3 \cdot 3 \cdot 5 \\ \text{LCM}(25, 45) &= 3 \cdot 3 \cdot 5 \cdot 5 \\ &= \mathbf{225} \end{aligned}$$

8. **3500**

9. (a) $\frac{24}{100} \div \frac{4}{4} = \mathbf{\frac{6}{25}}$

(b) $36 = 2 \cdot 2 \cdot 3 \cdot 3$
$180 = 2 \cdot 2 \cdot 3 \cdot 3 \cdot 5$
$$\frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{3} \cdot \cancel{3}}{\cancel{2} \cdot \cancel{2} \cdot \cancel{3} \cdot \cancel{3} \cdot 5} = \mathbf{\frac{1}{5}}$$

10. (a) 102° F − 32° F = **70° F**

(b) 212° F − 102° F = **110° F**

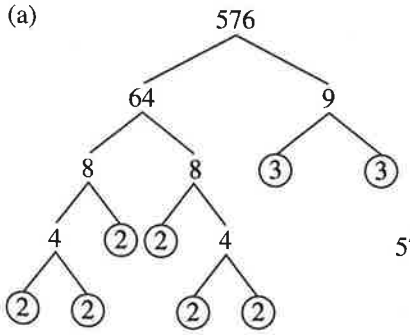
11. (a) $\frac{5}{12} \cdot \frac{3}{3} = \mathbf{\frac{15}{36}}$

(b) $\frac{1}{6} \cdot \frac{6}{6} = \mathbf{\frac{6}{36}}$

(c) $\frac{7}{9} \cdot \frac{4}{4} = \mathbf{\frac{28}{36}}$

(d) **Identity property of multiplication**

12. (a)



$576 = \mathbf{2^6 \cdot 3^2}$

(b) **24**

13. $5\frac{5}{6} \times 6\frac{6}{7} = \frac{\overset{5}{\cancel{35}}}{\underset{1}{\cancel{6}}} \times \frac{\overset{8}{\cancel{48}}}{\underset{1}{\cancel{7}}} = \mathbf{40}$

14. (a) **Obtuse angle**

(b) $\overline{\boldsymbol{AB}}$ (or $\overline{\boldsymbol{BA}}$) and $\overline{\boldsymbol{ED}}$ (or $\overline{\boldsymbol{DE}}$)

15. (a) $\mathbf{\frac{1}{2}}$

(b) $\mathbf{\frac{1}{2}}$

(c) $\mathbf{\frac{1}{2}}$

16. (a) Perimeter = 3 ft + 3 ft + 6 ft + 6 ft
= **18 ft**

(b) Area = 3 ft × 6 ft = **18 ft²**

17.
$$\begin{array}{r} 36^\circ \\ 10\overline{)360^\circ} \\ \underline{30} \\ 60 \\ \underline{60} \\ 0 \end{array}$$
$y = \mathbf{36^\circ}$

18. $12^2 - 2^4 = 144 - 16 = 128$
$p = \mathbf{128}$

19. $5\frac{1}{8} - 1\frac{3}{8}$ $\xrightarrow{4 + \frac{8}{8} + \frac{1}{8}}$ $4\frac{9}{8} - 1\frac{3}{8} = 3\frac{6}{8}$

$n = 3\frac{6}{8} = \mathbf{3\frac{3}{4}}$

20. $4\frac{1}{3} + 6\frac{2}{3} = 10\frac{3}{3} = 11$
$m = \mathbf{11}$

21. $10 - 1\frac{3}{5}$ $\longrightarrow$ $9\frac{5}{5} - 1\frac{3}{5} = \mathbf{8\frac{2}{5}}$

22. $5\frac{1}{3} \cdot 1\frac{1}{2} = \frac{\overset{8}{\cancel{16}}}{\underset{1}{\cancel{3}}} \cdot \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{2}}} = \mathbf{8}$

23. $3\frac{1}{3} \div \frac{5}{6} = \frac{10}{3} \div \frac{5}{6}$

$= \frac{\overset{2}{\cancel{10}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{2}{\cancel{6}}}{\underset{1}{\cancel{5}}} = \mathbf{4}$

24. $5\frac{1}{4} \div 3 = \frac{21}{4} \div \frac{3}{1}$

$= \frac{\overset{7}{\cancel{21}}}{4} \times \frac{1}{\underset{1}{\cancel{3}}} = \frac{7}{4} = \mathbf{1\frac{3}{4}}$

25. $\frac{\overset{1}{\cancel{5}}}{\underset{2}{\cancel{6}}} \cdot \frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{8}}} \cdot \frac{\overset{1}{\cancel{4}}}{\underset{1}{\cancel{15}}} = \mathbf{\frac{1}{4}}$

26. $\frac{8}{9} - \left(\frac{7}{9} - \frac{5}{9}\right) = \frac{8}{9} - \left(\frac{2}{9}\right) = \frac{6}{9} = \mathbf{\frac{2}{3}}$

27. 1 yard = 36 inches

$\frac{36 \text{ inches}}{2} = 18 \text{ inches}$

radius $= \frac{18 \text{ inches}}{2} = \mathbf{9 \text{ inches}}$

28. Example: \$1.50 ÷ 2 = **75¢**

29. (a) Missing length = 5 in. − 3 in.
= 2 in.

Missing height = 5 in. − 3 in.
= 2 in.

Perimeter = 5 in. + 5 in.
+ 2 in.
+ 3 in. + 3 in. + 2 in.
= **20 in.**

(b) Area = 25 in.^{2} − 9 in.^{2} = **16 in.^{2}**

30. (a) $\overline{CB}$ (or $\overline{BC}$)

(b) $\overline{AB}$ (or $\overline{BA}$)

(c) $\angle AMC$ (or $\angle CMA$)

(d) $\angle ABC$ (or $\angle CBA$ or $\angle ABM$ or $\angle MBA$) and $\angle BAM$ (or $\angle MAB$)

(e) $\overline{MA}$ (or $\overline{AM}$) and $\overline{MB}$ (or $\overline{BM}$)

LESSON 28, LESSON PRACTICE

a.
$$\begin{array}{r} \$20.00 \\ -\ \$5.36 \\ \hline \$14.64 \end{array}$$

$$3\overline{)\$14.64} \quad \$4.88$$
12
26
24
24
0

\$4.88

b. 32 students ÷ 8 = 4 students

5 × 4 students = 20 students

20 boys

c.
$$\begin{array}{r} 28 \text{ students} \\ 29 \text{ students} \\ 30 \text{ students} \\ +\ 25 \text{ students} \\ \hline 112 \text{ students} \end{array}$$

$$4\overline{)112} \quad 28$$
8
32
32
0

28 students

d.
$$\begin{array}{r} 46 \\ 37 \\ 34 \\ 31 \\ 29 \\ +\ 24 \\ \hline 201 \end{array}$$

$$6\overline{)201} \quad 33$$
18
21
18
3

$33\frac{3}{6} = \mathbf{33\frac{1}{2}}$

e.
$$\begin{array}{r} 40 \\ +\ 70 \\ \hline 110 \end{array}$$

$$2\overline{)110} \quad 55$$
10
10
10
0

55; 55

f. B. 84; The average score must fall between the highest and lowest scores.

LESSON 28, MIXED PRACTICE

1.

$$\begin{array}{r} 242 \text{ pounds} \\ 236 \text{ pounds} \\ 248 \text{ pounds} \\ 268 \text{ pounds} \\ +\ 226 \text{ pounds} \\ \hline 1220 \text{ pounds} \end{array} \qquad \begin{array}{r} 244 \\ 5\overline{)1220} \\ 10 \\ \hline 22 \\ 20 \\ \hline 20 \\ 20 \\ \hline 0 \end{array}$$

244 pounds

2. 5 minutes = 5 × 60 seconds
= 300 seconds

$$\begin{array}{r} 300 \text{ seconds} \\ +\ 14 \text{ seconds} \\ \hline \textbf{314 seconds} \end{array}$$

3.

$$\begin{array}{r} \$15.99 \\ \times \quad 3 \\ \hline \$47.97 \end{array}$$

$$\begin{array}{r} \$47.97 \\ +\ \$24.95 \\ \hline \$72.92 \end{array}$$

4.

$$\begin{array}{r} 1492 \\ -\ 41 \\ \hline \textbf{1451} \end{array}$$

5. $75\% = \frac{75}{100} = \frac{3}{4}$

5000 meters

Salma led $\frac{3}{4}$.

1250 meters
1250 meters
1250 meters

Salma did not lead $\frac{1}{4}$.

1250 meters

(a)

$$\begin{array}{r} 1250 \\ \times \quad 3 \\ \hline 3750 \end{array}$$

3750 meters

(b) **1250 meters**

6. (a) Perimeter = 4 in. + 4 in. + 8 in. + 8 in. = **24 in.**

(b) Area = 4 in. × 8 in. = **32 in.^{2}**

7. (a) **3, 6, 9, 12, 15, 18**

(b) **4, 8, 12, 16, 20, 24**

(c) **12**

(d)
$$\begin{aligned} 27 &= 3 \cdot 3 \cdot 3 \\ 36 &= 2 \cdot 2 \cdot 3 \cdot 3 \\ \text{LCM } (27, 36) &= 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \\ &= \mathbf{108} \end{aligned}$$

8. (a) **280**

(b) **300**

9.
$$\begin{aligned} 56 &= 2 \cdot 2 \cdot 2 \cdot 7 \\ 240 &= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 \end{aligned}$$

$$\frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot 7}{\underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot 2 \cdot 3 \cdot 5} = \frac{7}{30}$$

10.

$$\begin{array}{r} 1760 \\ 3\overline{)5280} \\ 3 \\ \hline 22 \\ 21 \\ \hline 18 \\ 18 \\ \hline 00 \\ 0 \\ \hline 0 \end{array}$$

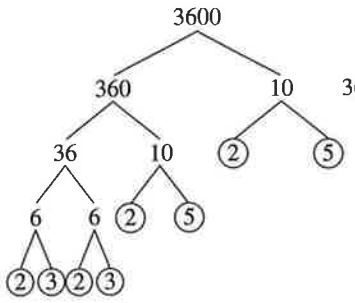
1760 yards

11. (a) $\frac{7}{8} \cdot \frac{3}{3} = \mathbf{\frac{21}{24}}$

(b) $\frac{11}{12} \cdot \frac{2}{2} = \mathbf{\frac{22}{24}}$

(c) $\frac{21}{24} + \frac{22}{24} = \frac{43}{24} = \mathbf{1\frac{19}{24}}$

12. (a)

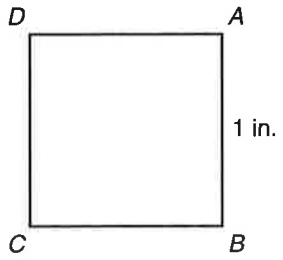


$3600 = 2^4 \cdot 3^2 \cdot 5^2$

(b) $\sqrt{3600} = \sqrt{60^2} = \mathbf{60}$

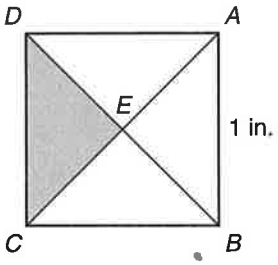
13. Add the six numbers. Then divide the sum by 6.

14. (a)



Area = 1 in. × 1 in.
= **1 square inch**

(b)–(c)



(d) **25%**

15. (a) $\mathbf{-1,\ 0,\ \frac{1}{10},\ 1,\ \frac{11}{10}}$

(b) $\mathbf{-1,\ 1}$

16.
$$\begin{array}{r} 30^\circ \\ 12\overline{)360^\circ} \\ \underline{36} \\ 00 \\ \underline{0} \\ 0 \end{array}$$

$y = \mathbf{30^\circ}$

17. $10^2 - 8^2 = 100 - 64 = 36$
$m = \mathbf{36}$

18.
$$\begin{array}{r} 3 \\ 60\overline{)180} \\ \underline{180} \\ 0 \end{array}$$

$w = \mathbf{3}$

19. $4\frac{5}{12} - 1\frac{1}{12} = 3\frac{4}{12} = \mathbf{3\frac{1}{3}}$

20. $8\frac{7}{8} + 3\frac{3}{8} = 11\frac{10}{8} = 12\frac{2}{8} = \mathbf{12\frac{1}{4}}$

21.
$$\begin{array}{r} 12 \\ -\ 8\frac{1}{8} \\ \hline \end{array} \longrightarrow \begin{array}{r} 11\frac{8}{8} \\ -\ 8\frac{1}{8} \\ \hline \mathbf{3\frac{7}{8}} \end{array}$$

22. $6\frac{2}{3} \cdot 1\frac{1}{5} = \frac{\overset{4}{\cancel{20}}}{\underset{1}{\cancel{3}}} \cdot \frac{\overset{2}{\cancel{6}}}{\underset{1}{\cancel{5}}} = \mathbf{8}$

23. $\left(1\frac{1}{2}\right)^2 \div 7\frac{1}{2} = \left(\frac{3}{2}\right)^2 \div \frac{15}{2}$
$= \left(\frac{3}{2} \cdot \frac{3}{2}\right) \div \frac{15}{2} = \frac{9}{4} \div \frac{15}{2}$
$= \frac{\overset{3}{\cancel{9}}}{\underset{2}{\cancel{4}}} \times \frac{\overset{1}{\cancel{2}}}{\underset{5}{\cancel{15}}} = \mathbf{\frac{3}{10}}$

24. $8 \div 2\frac{2}{3} = \frac{8}{1} \div \frac{8}{3} = \frac{\overset{1}{\cancel{8}}}{1} \times \frac{3}{\underset{1}{\cancel{8}}} = \mathbf{3}$

25.
$$\begin{array}{r} \mathbf{125} \\ 80\overline{)10{,}000} \\ \underline{80} \\ 200 \\ \underline{160} \\ 400 \\ \underline{400} \\ 0 \end{array}$$

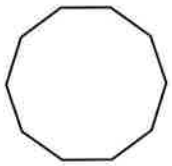
26. $\frac{3}{4} - \left(\frac{1}{2} \div \frac{2}{3}\right)$

$= \frac{3}{4} - \left(\frac{1}{2} \times \frac{3}{2}\right) = \frac{3}{4} - \left(\frac{3}{4}\right) = \mathbf{0}$

27. (a) $3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = 9 \cdot 9 = \mathbf{81}$

(b) $3^2 + 4^2 = 9 + 16 = \mathbf{25}$

28. **Check polygon for ten sides; one possibility:**



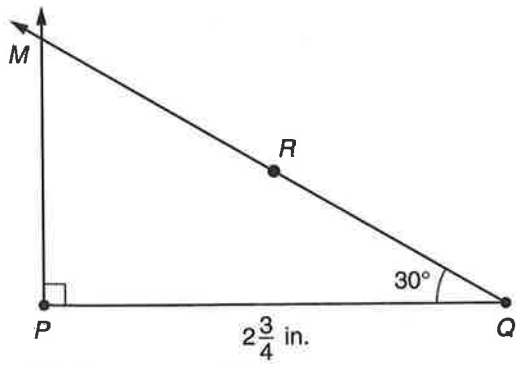
29. (a) $\angle ACD$

(b) $\overline{CB}$

(c) Area $= 2\left(7\frac{1}{2}\text{ in.}^2\right)$

$= 2 \times \frac{15}{2}\text{ in.}^2 = \mathbf{15\text{ in.}^2}$

30.



$\angle PMQ$ measures 60°.

LESSON 29, LESSON PRACTICE

a. $17\underline{6}0 \longrightarrow$ **1800**

b. $5\underline{4}89 \longrightarrow$ **5000**

c. $186\underline{,}282 \longrightarrow$ **186,000**

d. $7986 - 3074$

$\downarrow \quad \downarrow$

$8000 - 3000 = \mathbf{5000}$

e. $\begin{array}{r} 300 \\ \times\ \ 30 \\ \hline \mathbf{9000} \end{array}$

f. $\frac{5860}{19} \longrightarrow \frac{6000}{20} = \mathbf{300}$

g. $12\frac{1}{4} \div 3\frac{7}{8}$

$\downarrow \quad \downarrow$

$12 \div 4 = \mathbf{3}$

h. Area $= 1\frac{7}{8}\text{ in.} \times 1\frac{1}{8}\text{ in.}$

$= \frac{15}{8}\text{ in.} \times \frac{9}{8}\text{ in.} = \frac{135}{64}\text{ in.}^2$

$= \mathbf{2\frac{7}{64}\text{ in.}^2}$

The answer is reasonable because the estimated area is 2 in. × 1 in. = 2 in.^{2}.

LESSON 29, MIXED PRACTICE

1. 16 feet = 16 (12 inches)

$\begin{array}{r} 16 \\ \times\ 12 \\ \hline 32 \\ 16 \\ \hline 192 \text{ inches} \end{array}$

192 inches + 8 inches = **200 inches**

2. **The cost per pound means the cost for each pound. We divide $3.68, which is the cost for 8 pounds, by 8.**

3.
$$\begin{array}{r} 75 \\ 70 \\ 80 \\ 80 \\ 85 \\ +\ 90 \\ \hline 480 \end{array} \qquad \begin{array}{r} \mathbf{80} \\ 6\overline{)480} \\ 48 \\ \hline 00 \\ 0 \\ \hline 0 \end{array}$$

4. 1,000,000,000,000
219,800,000,000
780,200,000,000
Seven hundred eighty billion, two hundred million

5. $40\% = \frac{40}{100} \div \frac{20}{20} = \frac{2}{5}$

80 chips

$\frac{2}{5}$ were blue.	16 chips
	16 chips
$\frac{3}{5}$ were not blue.	16 chips
	16 chips
	16 chips

(a) 2×16 chips $=$ **32 chips**

(b) 3×16 chips $=$ **48 chips**

6. (a)
$$\begin{aligned} 4 &= 2 \cdot 2 \\ 6 &= 2 \cdot 3 \\ 8 &= 2 \cdot 2 \cdot 2 \\ \text{LCM}\ (4, 6, 8) &= 2 \cdot 2 \cdot 2 \cdot 3 = \mathbf{24} \end{aligned}$$

(b)
$$\begin{aligned} 16 &= 2 \cdot 2 \cdot 2 \cdot 2 \\ 36 &= 2 \cdot 2 \cdot 3 \cdot 3 \\ \text{LCM}\ (16, 36) &= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \\ &= \mathbf{144} \end{aligned}$$

7. (a) Perimeter $= \frac{3}{4}$ in. $+ \frac{3}{4}$ in. $+ \frac{3}{4}$ in. $+ \frac{3}{4}$ in. $= \frac{12}{4}$ in.
$= \mathbf{3\ in.}$

(b) Area $= \frac{3}{4}$ in. $\times \frac{3}{4}$ in. $= \mathbf{\frac{9}{16}\ in.^2}$

8. (a) $3\underline{6}\textcircled{6} \longrightarrow$ **400**

(b) $3\underline{6}\textcircled{6} \longrightarrow$ **370**

9. $6143 + 4952$
$\downarrow \quad \downarrow$
$6000 + 5000 = \mathbf{11{,}000}$

10. (a) $\frac{3}{4} \cdot 5\frac{1}{3} \cdot 1\frac{1}{8}$
$\downarrow \quad \downarrow \quad \downarrow$
$1 \cdot 5 \cdot 1 = \mathbf{5}$

(b) $\frac{3}{4} \cdot 5\frac{1}{3} \cdot 1\frac{1}{8}$
$= \frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{4}}} \cdot \frac{\overset{1}{\cancel{16}}}{\underset{1}{\cancel{3}}} \cdot \frac{9}{\underset{1}{\cancel{8}}} = \frac{9}{2} = \mathbf{4\frac{1}{2}}$

11. (a) $\frac{2}{3} \cdot \frac{10}{10} = \mathbf{\frac{20}{30}}$

(b) $\frac{25 \div 5}{30 \div 5} = \mathbf{\frac{5}{6}}$

12. $1{,}000{,}000{,}000 =$
$1{,}000{,}000 \cdot 1000 =$
$1000 \cdot 1000 \cdot 1000 =$
$2 \cdot 2 \cdot 2 \cdot 5 \cdot 5 \cdot 5 \cdot 2 \cdot 2 \cdot 2 \cdot 5 \cdot 5 \cdot 5$
$\cdot 2 \cdot 2 \cdot 2 \cdot 5 \cdot 5 \cdot 5$
$= \mathbf{2^9 \cdot 5^9}$

13. (a) **50%**

(b) **50%**

(c) **50%**

14. $BC = 2$ in. $+ 2$ in. $= 4$ in.
$AC = 2$ in. $+ 4$ in. $= 6$ in.
$AF + CD = AC = 6$ in.
$AF = 3$ in.
$CD = 3$ in.

(a) Perimeter $= 3$ in. $+ 3$ in. $+ 2$ in. $+ 2$ in. $= \mathbf{10\ in.}$

(b) Area $= 4$ in. $\times 3$ in. $= \mathbf{12\ in.^2}$

15. (a) $\mathbf{\angle AFB}$

(b) **90°**

16. $8^2 = 64$
$$\begin{array}{r} 16 \\ 4\overline{)64} \\ 4 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$$
$m = \mathbf{16}$

17. $15 \longrightarrow 14\frac{9}{9}$

$$\begin{array}{r} 14\frac{9}{9} \\ -\ 4\frac{4}{9} \\ \hline x = \mathbf{10\frac{5}{9}} \end{array}$$

18. $3\frac{5}{9} + 4\frac{7}{9} = 7\frac{12}{9} = 8\frac{3}{9} = 8\frac{1}{3}$

$n = \mathbf{8\frac{1}{3}}$

19. $6\frac{1}{3} \xrightarrow{5 + \frac{3}{3} + \frac{1}{3}} 5\frac{4}{3}$

$$\begin{array}{r} 5\frac{4}{3} \\ -\ 5\frac{2}{3} \\ \hline \mathbf{\frac{2}{3}} \end{array}$$

20. $\frac{\overset{4}{\cancel{20}}}{3} \times \frac{1}{\underset{1}{\cancel{5}}} = \frac{4}{3} = \mathbf{1\frac{1}{3}}$

21. $1\frac{2}{3} \div 3\frac{1}{2} = \frac{5}{3} \div \frac{7}{2} =$

$\frac{5}{3} \times \frac{2}{7} = \mathbf{\frac{10}{21}}$

22.
$$\begin{array}{r} \$7.49 \\ \times\ \ 24 \\ \hline 2996 \\ 1498 \\ \hline \mathbf{\$179.76} \end{array}$$

23. **Round $5\frac{1}{3}$ to 5 and round $4\frac{7}{8}$ to 5. Then multiply the rounded numbers. The product of the mixed numbers is about 25.**

24. (a) $10^3 \cdot 10^3 = 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$

$= 10^6$

$m = \mathbf{6}$

(b) $\frac{10^6}{10^3} = \frac{\overset{1}{\cancel{10}} \cdot \overset{1}{\cancel{10}} \cdot \overset{1}{\cancel{10}} \cdot 10 \cdot 10 \cdot 10}{\underset{1}{\cancel{10}} \cdot \underset{1}{\cancel{10}} \cdot \underset{1}{\cancel{10}}}$

$= 10 \cdot 10 \cdot 10 = 10^3$

$n = \mathbf{3}$

25. $k = 2^5 + 1 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 + 1$

$= 32 + 1 = \mathbf{33}$

26. (a) Diameter = 2 (1 inch)

= **2 inches**

(b) Perimeter = 6 (1 inch)

= **6 inches**

27. $\frac{2}{3} \cdot \frac{2}{2} = \frac{4}{6}$; $\frac{1}{2} \cdot \frac{3}{3} = \frac{3}{6}$

$\frac{4}{6} - \frac{3}{6} = \mathbf{\frac{1}{6}}$

28. (a) **Acute angle**

(b) **Obtuse angle**

(c) **Straight angle**

29. 1 quart = 4 cups = 32 ounces

2 cups = 16 ounces

32 ounces − 16 ounces = **16 ounces**

30. Missing height = 6 in. − 4 in.

= 2 in.

Missing length = 8 in. + 3 in.

= 11 in.

Perimeter = 4 in. + 8 in. + 2 in.

+ 3 in. + 6 in. + 11 in.

= **34 in.**

LESSON 30, LESSON PRACTICE

a. $\frac{3}{5} \cdot \frac{2}{2} = \frac{6}{10}$

$\mathbf{\frac{6}{10} < \frac{7}{10}}$

b. $\frac{5}{12} \cdot \frac{5}{5} = \frac{25}{60}$; $\frac{7}{15} \cdot \frac{4}{4} = \frac{28}{60}$

$\mathbf{\frac{25}{60} < \frac{28}{60}}$

c.
$$\begin{array}{rl} & \frac{3}{4} \cdot \frac{6}{6} = \frac{18}{24} \\ & \frac{5}{6} \cdot \frac{4}{4} = \frac{20}{24} \\ + & \frac{3}{8} \cdot \frac{3}{3} = \frac{9}{24} \\ \hline & \frac{47}{24} \end{array}$$

$$\frac{47}{24} = \mathbf{1\,\frac{23}{24}}$$

d.
$$\begin{array}{rl} & 7\frac{5}{6} = 7\frac{5}{6} \\ - & 2\frac{1}{2} = 2\frac{3}{6} \\ \hline & 5\frac{2}{6} = \mathbf{5\,\frac{1}{3}} \end{array}$$

e.
$$\begin{array}{rl} & 4\frac{3}{4} = 4\frac{6}{8} \\ + & 5\frac{5}{8} = 5\frac{5}{8} \\ \hline & 9\frac{11}{8} = \mathbf{10\,\frac{3}{8}} \end{array}$$

f. $4\frac{1}{6} \cdot \frac{3}{3} = 4\frac{3}{18}$

$2\frac{5}{9} \cdot \frac{2}{2} = 2\frac{10}{18}$

$$\begin{array}{r} 4\frac{3}{18} \\ - \; 2\frac{10}{18} \\ \hline \end{array} \qquad \xrightarrow{\;3 + \frac{18}{18} + \frac{3}{18}\;} \qquad \begin{array}{r} 3\frac{21}{18} \\ - \; 2\frac{10}{18} \\ \hline \mathbf{1\,\frac{11}{18}} \end{array}$$

g. $\frac{3}{25} = \frac{3}{5 \cdot 5}$, $\frac{2}{45} = \frac{2}{3 \cdot 3 \cdot 5}$

$3 \cdot 3 \cdot 5 \cdot 5 = 225$

$$\begin{array}{rl} & \frac{3}{25} \cdot \frac{9}{9} = \frac{27}{225} \\ - & \frac{2}{45} \cdot \frac{5}{5} = \frac{10}{225} \\ \hline & \frac{17}{225} \end{array}$$

LESSON 30, MIXED PRACTICE

1.
$$\begin{array}{r} 76 \text{ inches} \\ 77 \text{ inches} \\ 77 \text{ inches} \\ 78 \text{ inches} \\ + \; 82 \text{ inches} \\ \hline 390 \text{ inches} \end{array}$$

$$5\overline{)390} \quad 78$$

35
40
40
0

78 inches

2.
$$\begin{array}{r} \$0.87 \\ \times \quad 6 \\ \hline \$5.22 \end{array} \qquad \begin{array}{r} \$10.00 \\ - \; \$5.22 \\ \hline \mathbf{\$4.78} \end{array}$$

3. **Barney is correct. By estimating, we know the total is closer to 12,000 pounds than 120,000 pounds.**

4.
$$\begin{array}{r} 260 \\ - \; 140 \\ \hline 120 \end{array} \qquad \frac{120 \div 10}{260 \div 10} = \frac{12}{26} = \mathbf{\frac{6}{13}}$$

5. $30\% = \frac{30}{100} \div \frac{10}{10} = \frac{3}{10}$

2140 miles

$\frac{3}{10}$ completed	214 miles
	214 miles
	214 miles
$\frac{7}{10}$ not completed	214 miles
	214 miles
	214 miles
	214 miles
	214 miles
	214 miles
	214 miles

(a) 3×214 miles $=$ **642 miles**

(b) 7×214 miles $=$ **1498 miles**

6. 5 feet $= 5(12 \text{ inches}) = 60$ inches

$60 \text{ inches} \div 4 =$ **15 inches**

7. $18 = 2 \cdot 3 \cdot 3$

$30 = 2 \cdot 3 \cdot 5$

$2 \cdot 3 \cdot 3 \cdot 5 = 90$

$$\frac{1}{18} \cdot \frac{5}{5} = \frac{5}{90}$$

$$-\frac{1}{30} \cdot \frac{3}{3} = \frac{3}{90}$$

$$\frac{2}{90} = \frac{\mathbf{1}}{\mathbf{45}}$$

8. (a) $36,\underline{4}67 \longrightarrow$ **36,000**

(b) $36,\underline{4}67 \longrightarrow$ **36,500**

9.
$$\begin{array}{r} \mathbf{600} \\ 50\overline{)30{,}000} \\ \underline{300} \\ 00 \\ \underline{0} \\ 00 \\ \underline{0} \\ 0 \end{array}$$

10. (a) $\frac{32}{100} \div \frac{4}{4} = \mathbf{\frac{8}{25}}$

(b) $\frac{48}{72} = \frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot 2 \cdot \overset{1}{\cancel{3}}}{\underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{3}} \cdot 3}$

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

11. $\frac{5}{6} \cdot \frac{4}{4} = \frac{20}{24}$, $\frac{7}{8} \cdot \frac{3}{3} = \frac{21}{24}$

$\mathbf{\frac{20}{24} < \frac{21}{24}}$

12. (a) Area = 3 in. × 3 in. = **9 in.²**

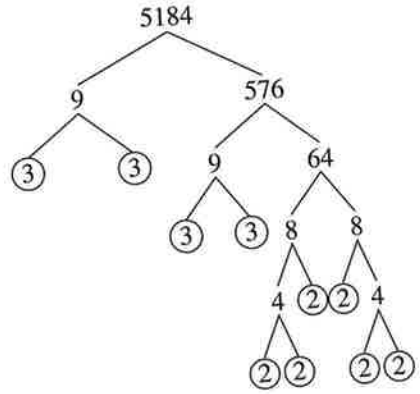
(b) Area = 4 in. × 4 in. = **16 in.²**

(c) 16 in.² + 9 in.² = **25 in.²**

13. (a) Perimeter = 3 in. + 3 in.
+ 1 in. + 4 in. + 4 in.
+ 4 in. + 3 in. = **22 in.**

(b) **The perimeter of the hexagon is 6 in. less than the combined perimeter of the squares because a 3 in. side of the smaller square and the adjoining 3 in. portion of a side of the larger square are not part of the perimeter of the hexagon.**

14. (a)



$5184 = \mathbf{2^6 \cdot 3^4}$

(b) $\sqrt{5184} = \sqrt{2^6 \cdot 2^4}$

$= 2^3 \cdot 2^2 = \mathbf{72}$

15.
$$\begin{array}{r} 5 \\ 7 \\ 9 \\ 11 \\ 12 \\ 13 \\ 24 \\ 25 \\ 26 \\ +\ 28 \\ \hline 160 \end{array} \qquad \begin{array}{r} \mathbf{16} \\ 10\overline{)160} \\ \underline{10} \\ 60 \\ \underline{60} \\ 0 \end{array}$$

16. **1, 2, 3, 5, 6, 7, 9**

17. $6^3 = 6 \cdot 6 \cdot 6 = 36 \cdot 6 = 216$

$$\begin{array}{r} 36 \\ 6\overline{)216} \\ \underline{18} \\ 36 \\ \underline{36} \\ 0 \end{array}$$

$w = \mathbf{36}$

18. $90° + 30° = 120°$

$180° - 120° = 60°$

$a = \mathbf{60°}$

19.
$$36\overline{)\$45.00}\quad \$1.25$$
$$\begin{array}{r} 36 \\ \hline 90 \\ 72 \\ \hline 180 \\ 180 \\ \hline 0 \end{array}$$

$p = \mathbf{\$1.25}$

20.
$$\begin{array}{r} \$3.75 \\ \times \quad 32 \\ \hline 750 \\ 1125 \\ \hline \$120.00 \end{array}$$

$t = \mathbf{\$120.00}$

21.
$$\begin{array}{rl} \frac{1}{2} \cdot \frac{3}{3} = & \frac{3}{6} \\ + \frac{1}{3} \cdot \frac{2}{2} = & \frac{2}{6} \\ \hline & \mathbf{\frac{5}{6}} \end{array}$$

22.
$$\begin{array}{rl} \frac{3}{4} \cdot \frac{3}{3} = & \frac{9}{12} \\ - \frac{1}{3} \cdot \frac{4}{4} = & \frac{4}{12} \\ \hline & \mathbf{\frac{5}{12}} \end{array}$$

23.
$$\begin{array}{rl} 2\frac{5}{6} = & 2\frac{5}{6} \\ - 1\frac{1}{2} = & 1\frac{3}{6} \\ \hline & 1\frac{2}{6} \end{array}$$

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

24. $\frac{4}{5} \cdot 1\frac{2}{3} \cdot 1\frac{1}{8}$

$= \frac{\overset{1}{\cancel{4}}}{\underset{1}{\cancel{5}}} \cdot \frac{\overset{1}{\cancel{5}}}{\underset{1}{\cancel{3}}} \cdot \frac{\overset{3}{\cancel{9}}}{\underset{2}{\cancel{8}}} = \frac{3}{2} = \mathbf{1\frac{1}{2}}$

25. $1\frac{3}{4} \div 2\frac{2}{3} = \frac{7}{4} \div \frac{8}{3}$

$= \frac{7}{4} \times \frac{3}{8} = \mathbf{\frac{21}{32}}$

26. $3 \div 1\frac{7}{8} = \frac{3}{1} \div \frac{15}{8}$

$= \frac{\overset{1}{\cancel{3}}}{1} \times \frac{8}{\underset{5}{\cancel{15}}} = \frac{8}{5} = \mathbf{1\frac{3}{5}}$

27. $3\frac{2}{3} + 1\frac{5}{6}$

$\downarrow \quad \downarrow$

$4 + 2 = \mathbf{6}$

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

$+ 1\frac{5}{6} = 1\frac{5}{6}$

$4\frac{9}{6} = \mathbf{5\frac{1}{2}}$

28. $5\frac{1}{8} - 1\frac{3}{4}$

$\downarrow \quad \downarrow$

$5 - 2 = \mathbf{3}$

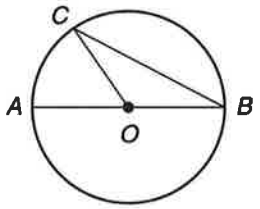
$1\frac{3}{4} \cdot \frac{2}{2} = 1\frac{6}{8}$

$5\frac{1}{8} \xrightarrow{4 + \frac{8}{8} + \frac{1}{8}} 4\frac{9}{8}$

$- 1\frac{6}{8} \qquad\qquad - 1\frac{6}{8}$

$\mathbf{3\frac{3}{8}}$

29.



See student work. One possibility is shown.

30. (a) $\overline{AB}$ (or $\overline{BA}$)

(b) $\overline{OA}, \overline{OB}, \overline{OC}$

(c) $\angle BOC$ (or $\angle COB$)