

Mathematics Diagnostic Evaluation from pages 2-4

- 1) 1,517.63 2) 20.74 3) 100.66 4) \$323.72 5) 46.11 6) 754.5 7) 16.91 8) 19,494.7 9) \$173.04 10) 403.26 11) 36
 12) 2,500 13) $\frac{2}{3}$ 14) 6.25 15) $\frac{4}{5}$ 16) 40% 17) 0.4% 18) 0.05 19) 1:3 20) 0.02 21) $1\frac{1}{4}$ 22) $6\frac{13}{24}$ 23) $1\frac{11}{18}$ 24) $\frac{3}{5}$ 25) $14\frac{7}{8}$
 26) $\frac{1}{100}$ 27) 0.009 28) 320 29) 3 30) 0.05 31) 4 32) 0.09 33) 0.22 34) 25 35) 4 36) 0.75 37) 3 38) 500 39) 18.24
 40) 2.4 41) $\frac{1}{5}$ 42) 1:50 43) 5 tablets 44) 2 milligrams 45) 30 kilograms 46) 3.3 pounds 47) $6\frac{2}{3} = 6.67$ centimeters
 48) 7.5 centimeters 49) 90% 50) 5:1

Solutions—Mathematics Diagnostic Evaluation

- 1) $1517 + 0.63 = 1517.00$

$$\begin{array}{r} 1517.00 \\ + 0.63 \\ \hline 1,517.63 \end{array}$$
- 2) $0.7 + 0.035 + 20.006 = 20.741 = 20.74$

$$\begin{array}{r} 0.700 \\ 0.035 \\ + 20.006 \\ \hline 20.741 = 20.74 \end{array}$$
- 3) $9.50 + 17.06 + 32.00 + 41.11 + 0.99 = 100.66$

$$\begin{array}{r} 9.50 \\ 17.06 \\ 32.00 \\ 41.11 \\ + 0.99 \\ \hline 100.66 \end{array}$$
- 4) $\$19.69 + \$304.03 = \$323.72$

$$\begin{array}{r} \$19.69 \\ + 304.03 \\ \hline \$323.72 \end{array}$$
- 5) $93.2 - 47.09 = 46.11$

$$\begin{array}{r} 93.20 \\ - 47.09 \\ \hline 46.11 \end{array}$$
- 6) $1,005.0 - 250.5 = 754.5$

$$\begin{array}{r} 1,005.0 \\ - 250.5 \\ \hline 754.5 \end{array}$$
- 7) $17.156 - 0.25 = 16.906 = 16.91$

$$\begin{array}{r} 17.156 \\ - 0.250 \\ \hline 16.906 = 16.91 \end{array}$$
- 8) $509 \times 38.3 = 19,494.7$

$$\begin{array}{r} 509 \\ \times 38.3 \\ \hline 1527 \\ 4072 \\ 1527 \\ \hline 194947 = 19,494.7 \end{array}$$
- 9) $\$4.12 \times 42 = \173.04

$$\begin{array}{r} \$4.12 \\ \times 42 \\ \hline 824 \\ 1648 \\ \hline \$173.04 \end{array}$$
- 10) $17.16 \times 23.5 = 403.26$

$$\begin{array}{r} 17.16 \\ \times 23.5 \\ \hline 8580 \\ 5148 \\ 3432 \\ \hline 403.260 = 403.26 \end{array}$$
- 11) $972 \div 27 = 36$

$$\begin{array}{r} 36 \\ 27 \overline{)972} \\ \underline{81} \\ 162 \end{array}$$
- 12) $2500 \div 0.001 = 2,500$

$$\begin{array}{r} 2500. \\ 0.001 \overline{)2.500} \\ \underline{2.500} \\ 0 \end{array} = 2,500$$
- 13) $\frac{1}{4} \div \frac{3}{8} = \frac{1}{4} \times \frac{8}{3} = \frac{2}{3}$
- 14) $\frac{1500}{240} = 6.25$

$$\begin{array}{r} 6.25 \\ 240 \overline{)1500.00} \\ \underline{1440} \\ 600 \\ \underline{480} \\ 1200 \\ \underline{1200} \\ 0 \end{array}$$
- 15) $0.8 = \frac{8}{10} = \frac{4}{5}$
- 16) $\frac{2}{5} = 5 \overline{)2.0} = 0.4 \times 100 = 40\%$

$$\begin{array}{r} 0.4 \\ 5 \overline{)2.0} \\ \underline{2.0} \\ 0 \end{array} = 0.40 \times 100 = 40\%$$
- 17) $0.004 \times 100 = 0.4\%$
- 18) $5\% = 5 \overline{)100} = 0.05$
- 19) $33\frac{1}{3}\% = \frac{33\frac{1}{3}}{100} = \frac{\frac{100}{3}}{100} = \frac{100}{3} \div \frac{100}{1} = \frac{100}{3} \times \frac{1}{100} = \frac{1}{3} = 1:3$
- 20) $1:50 = 50 \overline{)1.00} = 0.02$

$$\begin{array}{r} 0.02 \\ 50 \overline{)1.00} \\ \underline{1.00} \\ 0 \end{array}$$
- 21) $\frac{1}{2} + \frac{3}{4} = \frac{2}{4} + \frac{3}{4} = \frac{5}{4} = 1\frac{1}{4}$
- 22) $1\frac{2}{3} + 4\frac{7}{8} = 1\frac{16}{24} + 4\frac{21}{24} = 5\frac{37}{24} = 6\frac{13}{24}$

23)

$$\begin{array}{r} 1\frac{5}{6} = 1\frac{15}{18} \\ -\frac{2}{9} = -\frac{4}{18} \\ \hline 1\frac{11}{18} \end{array}$$

24)

$$\frac{1}{100} \times \frac{60}{1} = \frac{3}{5}$$

25)

$$4\frac{1}{4} \times 3\frac{1}{2} = \frac{17}{4} \times \frac{7}{2} = \frac{119}{8} = 14\frac{7}{8}$$

26)

$$\frac{1}{150}; \frac{1}{200}; \frac{1}{100}$$

$\frac{1}{100}$ is the greatest

27)

0.009

0.190

0.900

↑

0.009 has the smallest value in the tenth place

28)

$$\begin{array}{r} \frac{6.4}{0.02} = 0.02 \overline{) 6.40} = 320 \\ \underline{0.4} \\ 0.00 \\ \underline{0.00} \\ 00 \end{array}$$

29)

$$\frac{0.02 + 0.16}{0.4 - 0.34}$$

$$\begin{array}{r} 0.02 \\ + 0.16 \\ \hline 0.18 \end{array}$$

$$\begin{array}{r} 0.40 \\ - 0.34 \\ \hline 0.06 \end{array}$$

$$\frac{0.18}{0.06} = 0.06 \overline{) 0.18} = 3$$

30)

$$\frac{3}{12+3} \times 0.25 = \frac{3}{15} \times \frac{25}{100} = \frac{3}{60} = 0.05$$

31)

$$8\% \text{ of } 50 = .08 \times 50 = 4$$

32)

$$\frac{1}{2}\% = 0.5\% = 0.005 \quad \begin{array}{r} 18 \\ \times 0.005 \\ \hline 0.090 = 0.09 \end{array}$$

33)

$$0.9\% \times 24 = 0.009 \times 24 = 0.216 = 0.22$$

34)

$$\begin{aligned} \frac{1:1,000}{1:100} \times 250 &= \frac{1,000}{1} \times \frac{1}{100} \times 250 \\ &= \frac{1}{1,000} \times \frac{100}{1} \times \frac{250}{1} = \frac{250}{10} = 25 \end{aligned}$$

35)

$$\frac{300}{150} \times 2 = X$$

$$X = 4$$

36)

$$\begin{aligned} \frac{2.5}{5} \times 1.5 &= X \\ X &= 0.5 \times 1.5 = 0.75 \end{aligned}$$

37)

$$\begin{aligned} \frac{1,000,000}{250,000} \times X &= 12 \\ \frac{4X}{4} &= \frac{12}{4} \\ X &= 3 \end{aligned}$$

38)

$$\begin{aligned} \frac{0.51}{1.7} \times X &= 150 \\ \frac{0.3X}{0.3} &= \frac{150}{0.3} \\ X &= 500 \end{aligned}$$

39)

$$\begin{aligned} X &= (82.4 - 52) \frac{3}{5} \\ X &= 30.4 \times \frac{3}{5} = 18.24 \end{aligned}$$

40)

$$\begin{aligned} \frac{1}{150} \times 1.2 &= X \\ \left(\frac{1}{150} \times \frac{300}{1} \right) \times 1.2 &= X \\ 2 \times 1.2 &= X \\ 2.4 &= X \end{aligned}$$

41)

$$2:10 = \frac{2}{10} = \frac{1}{5}$$

42)

$$2\% = \frac{2}{100} = \frac{1}{50} = 1:50$$

43)

$$25 \div 5 = 5 \text{ tablets}$$

44)

$$0.5 \times 4 = 2 \text{ milligrams/day}$$

45)

$$66 \text{ pounds} = \frac{66}{2.2} = 30 \text{ kilograms or}$$

$$\begin{array}{ccc} \frac{2.2 \text{ pounds}}{1 \text{ kilogram}} & \begin{array}{c} \swarrow \searrow \\ \times \end{array} & \frac{66 \text{ pounds}}{X \text{ kilograms}} \end{array}$$

$$2.2X = 66$$

$$\frac{2.2X}{2.2} = \frac{66}{2.2}$$

$$X = 30 \text{ kilograms}$$

46)

$$\begin{aligned} \frac{1 \text{ kg}}{2.2 \text{ lb}} &= \frac{1.5 \text{ kg}}{X \text{ lb}} & \frac{2.2}{\times 1.5} \\ X &= 3.3 \text{ lb} & \frac{110}{22} \\ & & \frac{3.30}{3.30} \end{aligned}$$

47) $\frac{1 \text{ cm}}{\frac{3}{8} \text{ in}} \times \frac{X \text{ cm}}{2\frac{1}{2} \text{ in}}$

$$\frac{3}{8}X = 2\frac{1}{2}$$

$$\frac{3}{8}X = \frac{5}{2}$$

$$\frac{3X}{8} = \frac{5}{2}$$

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

$$X = \frac{5}{2} \times \frac{8}{3} = \frac{20}{3}$$

48) $\frac{2.5 \text{ centimeters}}{1 \text{ inch}} \times \frac{X \text{ centimeters}}{3 \text{ inches}}$

$$X = 7.5 \text{ centimeters}$$

49) $\frac{5}{50}$ incorrect $\frac{45}{50} = \frac{X}{100}$

$$\frac{45}{50} \text{ correct } 50X = 4500$$

$$\frac{50X}{50} = \frac{4500}{50}$$

$$X = 90$$

$$\frac{90}{100} = 90\%$$

50) 5 females to 1 male
5:1

Review Set 1 from pages 10-12

1) $\frac{6}{6}, \frac{7}{5}$ 2) $\frac{1}{1}, \frac{100}{150}$ 3) $\frac{1}{4}, \frac{1}{14}$ 4) $3\frac{4}{8}, 1\frac{2}{9}, 1\frac{1}{4}, 5\frac{7}{8}$ 5) $\frac{3}{4} = \frac{6}{8}, \frac{1}{5} = \frac{2}{10}, \frac{3}{9} = \frac{1}{3}$ 6) $\frac{13}{2}$ 7) $\frac{6}{5}$ 8) $\frac{32}{3}$ 9) $\frac{47}{6}$ 10) $\frac{411}{4}$ 11) 2 12) 1

13) $3\frac{1}{3}$ 14) $1\frac{1}{3}$ 15) $2\frac{3}{4}$ 16) $\frac{6}{8}$ 17) $\frac{4}{16}$ 18) $\frac{8}{12}$ 19) $\frac{4}{10}$ 20) $\frac{6}{9}$ 21) $\frac{1}{100}$ 22) $\frac{1}{10,000}$ 23) $\frac{5}{9}$ 24) $\frac{3}{10}$ 25) $\frac{2}{5}$ bottle 26) $1\frac{1}{2}$ bottles

27) $\frac{1}{20}$ of the students are men 28) $\frac{9}{10}$ of the questions were answered correctly 29) $\frac{1}{2}$ dose 30) $\frac{1}{2}$ teaspoon

Solutions—Review Set 1

1) Improper fraction: numerator \geq denominator

$$\frac{6}{6}, \frac{7}{5}$$

2) Complex fraction: numerator and/or denominator is a fraction

$$\text{ans: } \frac{\frac{1}{100}}{\frac{1}{150}}$$

3) Proper fraction: numerator < denominator and value < 1

$$\text{ans: } \frac{1}{4}, \frac{1}{14}$$

4) Mixed number: whole number + fraction and value > 1

$$\text{ans: } 1\frac{2}{9}, 1\frac{1}{4}, 5\frac{7}{8}$$

5) $\frac{3}{4} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}, \frac{3}{4} = \frac{6}{8}$

$$\frac{1}{5} = \frac{1 \times 2}{5 \times 2} = \frac{2}{10}, \frac{1}{5} = \frac{2}{10}$$

$$\frac{3}{9} = \frac{3 \div 3}{9 \div 3} = \frac{1}{3}, \frac{3}{9} = \frac{1}{3}$$

6) $6\frac{1}{2} = \frac{(2 \times 6) + 1}{2} = \frac{13}{2}$

7) $1\frac{1}{5} = \frac{(5 \times 1) + 1}{5} = \frac{6}{5}$

8) $10\frac{2}{3} = \frac{(3 \times 10) + 2}{3} = \frac{32}{3}$

9) $7\frac{5}{6} = \frac{(6 \times 7) + 5}{6} = \frac{47}{6}$

10) $102\frac{3}{4} = \frac{(4 \times 102) + 3}{4} = \frac{411}{4}$

11) $\frac{24}{12} = 12 \frac{24}{24} = 2$

12) $\frac{\frac{1}{8}}{\frac{1}{8}} = 1$

13) $3\frac{3}{9} = 3\frac{3}{9}$
 $\frac{30}{9} = 9 \overline{)30}$
 $\frac{27}{3}$

$$3\frac{3}{9} = 3\frac{1}{3}$$

14) $\frac{100}{75} = 1\frac{25}{75} = 1\frac{1}{3}$

15) $2\frac{12}{16} = 2\frac{12}{16}$
 $\frac{44}{16} = 16 \overline{)44}$
 $\frac{32}{12}$

$$2\frac{12}{16} = 2\frac{3}{4}$$

16) $\frac{3}{4} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$

17) $\frac{1}{4} = \frac{1 \times 4}{4 \times 4} = \frac{4}{16}$

18) $\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$

19) $\frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10}$

20) $\frac{2}{3} = \frac{2 \times 3}{3 \times 3} = \frac{6}{9}$

21) $\frac{1}{100}$ is larger than $\frac{1}{150}$

The numerators are the same. The fraction with the smaller denominator has the greater value.

22) $\frac{1}{10,000}$ is smaller than $\frac{1}{1,000}$

23) $\frac{5}{9}$ is larger than $\frac{2}{9}$

The denominators are both the same. The fraction with the smaller numerator has the lesser value.

24) $\frac{3}{10}$ is smaller than $\frac{5}{10}$

25) 10 ounces – 6 ounces = 4 ounces remaining

$$\frac{2}{10} = \frac{2}{5} \text{ bottle remaining}$$

26)

$$\frac{1 \text{ bottle}}{12 \text{ doses}} \times \frac{X \text{ bottles}}{18 \text{ doses}}$$

$$12X = 18$$

$$\frac{12X}{12} = \frac{18}{12}$$

$$X = 1\frac{6}{12} = 1\frac{1}{2} \text{ bottles}$$

27) $\frac{57}{60}$ people in class

The men represent $\frac{3}{60}$ or $\frac{1}{20}$ of the students in the class.

28) $\frac{18}{20} = \frac{18+2}{20+2} = \frac{9}{10}$

29) $\frac{160 \text{ mg}}{1 \text{ dose}} \times \frac{80 \text{ mg}}{X \text{ doses}}$

$$160X = 80$$

$$\frac{160X}{160} = \frac{80}{160}$$

$$X = \frac{1}{2} \text{ dose}$$

30) $\frac{160 \text{ mg}}{1 \text{ t}} \times \frac{80 \text{ mg}}{X \text{ t}}$

$$160X = 80$$

$$\frac{160X}{160} = \frac{80}{160}$$

$$X = \frac{1}{2} \text{ teaspoon}$$

Review Set 2 from page 14

- 1) $8\frac{7}{15}$ 2) $1\frac{5}{12}$ 3) $17\frac{5}{24}$ 4) $1\frac{1}{24}$ 5) $32\frac{5}{6}$ 6) $5\frac{7}{12}$ 7) $1\frac{1}{3}$ 8) $5\frac{53}{72}$ 9) 43 10) $5\frac{118}{119}$ 11) $2\frac{8}{15}$ 12) $\frac{53}{132}$ 13) $\frac{1}{2}$ 14) $4\frac{5}{6}$ 15) $\frac{1}{24}$
 16) $63\frac{2}{3}$ 17) $299\frac{4}{5}$ 18) $\frac{1}{6}$ 19) $1\frac{2}{5}$ 20) $7\frac{1}{16}$ 21) $7\frac{2}{9}$ 22) $1\frac{1}{4}$ 23) $24\frac{6}{11}$ 24) $\frac{7}{12}$ 25) $\frac{1}{25}$ 26) $\frac{7}{12}$ ounce 27) $1\frac{1}{8}$ inches
 28) 8 inches 29) $21\frac{1}{2}$ pints 30) $13\frac{1}{4}$ pounds

Solutions—Review Set 2

1) $7\frac{4}{5} + \frac{2}{3} : 7\frac{12}{15}$

$$+ \frac{10}{15}$$

$$7\frac{22}{15} = 8\frac{7}{15}$$

2) $\frac{3}{4} + \frac{2}{3} : \frac{3}{4} = \frac{9}{12}$

$$+ \frac{2}{3} = +\frac{8}{12}$$

$$\frac{17}{12} = 1\frac{5}{12}$$

3) $4\frac{2}{3} + 5\frac{1}{24} + 7\frac{1}{2} : 4\frac{16}{24}$

$$5\frac{1}{24}$$

$$+ 7\frac{12}{24}$$

$$16\frac{29}{24} = 17\frac{5}{24}$$

4) $\frac{3}{4} + \frac{1}{8} + \frac{1}{6} = \frac{18}{24} + \frac{3}{24} + \frac{4}{24} = \frac{18+3+4}{24} = \frac{25}{24} = 1\frac{1}{24}$

5) $12\frac{1}{2} + 20\frac{1}{3} : 12\frac{1}{2} = 12\frac{3}{6}$

$$+ 20\frac{1}{3} = + 20\frac{2}{6}$$

$$32\frac{5}{6}$$

6) $\frac{1}{4} + 5\frac{1}{3} : \frac{1}{4} = \frac{3}{12}$

$$+ 5\frac{1}{3} = + 5\frac{4}{12}$$

$$5\frac{7}{12}$$

7) $\frac{1}{7} + \frac{2}{3} + \frac{11}{21} : \frac{1}{7} = \frac{3}{21}$

$$\frac{2}{3} = \frac{14}{21}$$

$$+ \frac{11}{21} = + \frac{11}{21}$$

$$\frac{28}{21} = 1\frac{7}{21} = 1\frac{1}{3}$$

8) $\frac{4}{9} + \frac{5}{8} + 4\frac{2}{3} : \frac{4}{9} = \frac{32}{72}$

$$\frac{5}{8} = \frac{45}{72}$$

$$+ 4\frac{2}{3} = + 4\frac{48}{72}$$

$$4\frac{125}{72} = 5\frac{53}{72}$$

$$9) \quad 34\frac{1}{2} + 8\frac{1}{2} : 34\frac{1}{2}$$

$$\quad \quad \quad + 8\frac{1}{2}$$

$$\quad \quad \quad \hline 42\frac{2}{2} = 43$$

$$10) \quad \frac{12}{17} + 5\frac{2}{7} : \frac{12}{17} = \frac{84}{119}$$

$$\quad \quad \quad + 5\frac{2}{7} = +5\frac{34}{119}$$

$$\quad \quad \quad \hline 5\frac{118}{119}$$

$$11) \quad \frac{6}{5} + 1\frac{1}{3} : \frac{6}{5} = \frac{18}{15}$$

$$\quad \quad \quad + 1\frac{1}{3} = +1\frac{5}{15}$$

$$\quad \quad \quad \hline 1\frac{23}{15} = 2\frac{8}{15}$$

$$12) \quad \frac{1}{4} + \frac{5}{33} : \frac{1}{4} = \frac{33}{132}$$

$$\quad \quad \quad + \frac{5}{33} = +\frac{20}{132}$$

$$\quad \quad \quad \hline \frac{53}{132}$$

$$13) \quad \frac{3}{4} - \frac{1}{4} : \frac{3}{4}$$

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

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

$$14) \quad 8\frac{1}{12} - 3\frac{1}{4} = 8\frac{1}{12} - 3\frac{3}{12} : 7\frac{13}{12}$$

$$\quad \quad \quad - 3\frac{3}{12}$$

$$\quad \quad \quad \hline 4\frac{10}{12} = 4\frac{5}{6}$$

$$15) \quad \frac{1}{8} - \frac{1}{12} : \frac{1}{8} = \frac{3}{24}$$

$$\quad \quad \quad - \frac{1}{12} = -\frac{2}{24}$$

$$\quad \quad \quad \hline \frac{1}{24}$$

$$16) \quad 100 - 36\frac{1}{3} : 100 = 99\frac{3}{3}$$

$$\quad \quad \quad - 36\frac{1}{3} = -36\frac{1}{3}$$

$$\quad \quad \quad \hline 63\frac{2}{3}$$

$$17) \quad 355\frac{1}{5} - 55\frac{2}{5} : 355\frac{1}{5} = 354\frac{6}{5}$$

$$\quad \quad \quad - 55\frac{2}{5} = -55\frac{2}{5}$$

$$\quad \quad \quad \hline 299\frac{4}{5}$$

$$18) \quad \frac{1}{3} - \frac{1}{6} : \frac{1}{3} = \frac{2}{6}$$

$$\quad \quad \quad - \frac{1}{6} = -\frac{1}{6}$$

$$\quad \quad \quad \hline \frac{1}{6}$$

$$19) \quad 2\frac{3}{5} - 1\frac{1}{5} : 2\frac{3}{5}$$

$$\quad \quad \quad - 1\frac{1}{5}$$

$$\quad \quad \quad \hline 1\frac{2}{5}$$

$$20) \quad 14\frac{3}{16} - 7\frac{1}{8} : 14\frac{3}{16} = 14\frac{3}{16}$$

$$\quad \quad \quad - 7\frac{1}{8} = -7\frac{2}{16}$$

$$\quad \quad \quad \hline 7\frac{1}{16}$$

$$21) \quad 25 - 17\frac{7}{9} : 25 = 24\frac{9}{9}$$

$$\quad \quad \quad - 17\frac{7}{9} = -17\frac{7}{9}$$

$$\quad \quad \quad \hline 7\frac{2}{9}$$

$$22) \quad 4\frac{7}{10} - 3\frac{9}{20} : 4\frac{7}{10} = 4\frac{14}{20}$$

$$\quad \quad \quad - 3\frac{9}{20} = -3\frac{9}{20}$$

$$\quad \quad \quad \hline 1\frac{5}{20} = 1\frac{1}{4}$$

$$23) \quad 48\frac{6}{11} - 24 : 48\frac{6}{11}$$

$$\quad \quad \quad - 24$$

$$\quad \quad \quad \hline 24\frac{6}{11}$$

$$24) \quad 1\frac{2}{3} - 1\frac{1}{12} : 1\frac{2}{3} = 1\frac{8}{12}$$

$$\quad \quad \quad - 1\frac{1}{12} = -1\frac{1}{12}$$

$$\quad \quad \quad \hline \frac{7}{12}$$

$$25) \quad 50 \text{ pounds} - 48 \text{ pounds} = 2 \text{ pounds lost}$$

$$\quad \quad \quad \frac{2}{50} = \frac{1}{25} \text{ of weight lost}$$

$$26) \quad \frac{1}{4} \text{ ounce} + \frac{1}{3} \text{ ounce} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12} \text{ ounce}$$

$$27) \quad \frac{1}{2} \text{ inch} + \frac{1}{4} \text{ inch} + \frac{3}{8} \text{ inch} = \text{total growth for 3 months}$$

$$\quad \quad \quad \frac{1}{2} = \frac{4}{8}$$

$$\quad \quad \quad \frac{1}{4} = \frac{2}{8}$$

$$\quad \quad \quad + \frac{3}{8} = \frac{3}{8}$$

$$\quad \quad \quad \hline \frac{9}{8} = 1\frac{1}{8} \text{ inches grown}$$

$$28) \quad 11 \text{ inches} - \left(1\frac{1}{2} \text{ inches} + 1\frac{1}{2} \text{ inches}\right)$$

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

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

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

$$\quad \quad \quad \hline 2\frac{2}{2} = 3 \text{ inches in the margins}$$

$$11 - 3 = 8 \text{ inches vertical area available to write}$$

$$29) \quad 56 - 34\frac{1}{2} : 55\frac{2}{2}$$

$$\quad \quad \quad \frac{-34\frac{1}{2}}{21\frac{1}{2}} \text{ pints}$$

$$30) \quad 20\frac{1}{2} - 7\frac{1}{4} : 20\frac{2}{4}$$

$$\quad \quad \quad \frac{-7\frac{1}{4}}{13\frac{1}{4}} \text{ pounds}$$

Review Set 3 from pages 19-20

- 1) $\frac{1}{40}$ 2) $\frac{36}{125}$ 3) $\frac{35}{48}$ 4) $\frac{3}{100}$ 5) 3 6) $1\frac{2}{3}$ 7) $\frac{4}{5}$ 8) $6\frac{8}{15}$ 9) $\frac{1}{2}$ 10) $23\frac{19}{36}$ 11) $\frac{3}{32}$ 12) $254\frac{1}{6}$ 13) 3 14) $1\frac{34}{39}$ 15) $\frac{3}{14}$ 16) $\frac{1}{11}$
 17) $\frac{1}{2}$ 18) $\frac{1}{30}$ 19) $3\frac{1}{3}$ 20) $\frac{3}{20}$ 21) $\frac{1}{3}$ 22) $\frac{7}{12}$ 23) $1\frac{1}{9}$ 24) 60 calories 25) 560 seconds 26) 40 doses 27) $31\frac{1}{2}$ tablets
 28) 1,275 milliliters 29) $52\frac{1}{2}$ ounces 30) 6 full days

Solutions—Review Set 3

$$1) \quad \frac{3}{10} \times \frac{1}{12}$$

$$\frac{\cancel{3}}{10} \times \frac{1}{\cancel{12}_4} = \frac{1}{40}$$

$$2) \quad \frac{12}{25} \times \frac{3}{5} = \frac{36}{125}$$

$$3) \quad \frac{5}{8} \times 1\frac{1}{6} = \frac{5}{8} \times \frac{7}{6} = \frac{35}{48}$$

$$4) \quad \frac{1}{100} \times 3 = \frac{1}{100} \times \frac{3}{1} = \frac{3}{100}$$

$$5) \quad \frac{1}{6} \times \frac{3}{2} = \left(\frac{1}{\cancel{6}_3} \times \frac{\cancel{3}}{2}\right) \times \left(\frac{3}{1} \times \frac{3}{2}\right) = \frac{2}{\cancel{6}_3} \times \frac{9}{2} = \frac{18}{3} = 3$$

$$6) \quad \frac{\frac{1}{150}}{\frac{1}{100}} \times 2\frac{1}{2} = \left(\frac{\frac{1}{\cancel{150}_3} \times \frac{\cancel{100}_2}{1}}{\frac{1}{1}}\right) \times \frac{5}{2}$$

$$= \frac{1}{3} \times \frac{\cancel{2}}{1} \times \frac{5}{2} = \frac{5}{3} = 1\frac{2}{3}$$

$$7) \quad \frac{30}{75} \times 2 = \frac{\cancel{30}_5}{\cancel{75}_5} \times \frac{2}{1} = \frac{4}{5}$$

$$8) \quad 9\frac{4}{5} \times \frac{2}{3} = \frac{49}{5} \times \frac{2}{3} = \frac{98}{15} = 6\frac{8}{15}$$

$$9) \quad \frac{3}{4} \times \frac{2}{3} = \frac{\cancel{3}}{4} \times \frac{\cancel{2}}{\cancel{3}_1} = \frac{1}{2}$$

$$10) \quad 4\frac{2}{3} \times 5\frac{1}{24} = \frac{14}{3} \times \frac{121}{24} = \frac{847}{36} = 23\frac{19}{36}$$

$$11) \quad \frac{3}{4} \times \frac{1}{8} = \frac{3}{32}$$

$$12) \quad 12\frac{1}{2} \times 20\frac{1}{3} = \frac{25}{2} \times \frac{61}{3} = \frac{1525}{6} = 254\frac{1}{6}$$

$$13) \quad \frac{3}{4} \div \frac{1}{4} = \frac{3}{\cancel{4}} \times \frac{\cancel{4}}{1} = \frac{3}{1} = 3$$

$$14) \quad 6\frac{1}{12} \div 3\frac{1}{4} = \frac{73}{12} \div \frac{13}{4} = \frac{73}{12} \times \frac{\cancel{4}}{3} = \frac{73}{39} = 1\frac{34}{39}$$

$$15) \quad \frac{1}{8} \div \frac{7}{12} = \frac{1}{\cancel{8}_2} \times \frac{\cancel{12}_4}{7} = \frac{3}{14}$$

$$16) \quad \frac{1}{33} \div \frac{1}{3} = \frac{1}{33} \times \frac{3}{1} = \frac{3}{33} = \frac{1}{11}$$

$$17) \quad 5\frac{1}{4} \div 10\frac{1}{2} = \frac{21}{4} \div \frac{21}{2} = \frac{\cancel{21}_2}{4} \times \frac{\cancel{2}_1}{\cancel{21}_1} = \frac{1}{2}$$

$$18) \quad \frac{1}{60} \div \frac{1}{2} = \frac{1}{\cancel{60}_{30}} \times \frac{\cancel{2}}{1} = \frac{1}{30}$$

$$19) \quad 2\frac{1}{2} \div \frac{3}{4} = \frac{5}{2} \div \frac{3}{4} = \frac{5}{2} \times \frac{\cancel{4}}{3} = \frac{10}{3} = 3\frac{1}{3}$$

$$20) \quad \frac{\frac{1}{20}}{\frac{1}{3}} = \frac{1}{20} \div \frac{1}{3} = \frac{1}{20} \times \frac{3}{1} = \frac{3}{20}$$

$$21) \quad \frac{1}{150} \div \frac{1}{50} = \frac{1}{\cancel{150}_3} \times \frac{\cancel{50}}{1} = \frac{1}{3}$$

$$22) \quad \frac{7}{8} \div 1\frac{1}{2} = \frac{7}{8} \div \frac{3}{2} = \frac{7}{8} \times \frac{\cancel{2}}{3} = \frac{7}{12}$$

$$23) \quad \frac{3}{5} \div \frac{4}{9} = \left(\frac{3}{5} \times \frac{4}{3}\right) \div \left(\frac{4}{5} \div \frac{10}{9}\right)$$

$$= \left(\frac{\cancel{3}}{5} \times \frac{4}{\cancel{3}}\right) \div \left(\frac{4}{5} \times \frac{9}{10}\right)$$

$$= \frac{4}{5} \div \frac{36}{50} = \frac{\cancel{4}}{5} \times \frac{\cancel{50}}{36} = \frac{10}{9} = 1\frac{1}{9}$$

24) $\frac{80 \text{ calories}}{1 \text{ apple}} \times \frac{X \text{ calories}}{\frac{3}{4} \text{ apple}} = 80$
 $X = \frac{3}{4} \times 80$
 $X = 60 \text{ calories}$

25) $\frac{60 \text{ sec}}{1 \text{ min}} \times \frac{X \text{ sec}}{9\frac{1}{3} \text{ min}} = 60$
 $X = 9\frac{1}{3} \times 60 = \frac{28}{3} \times 60 = 560$
 $X = 560 \text{ seconds}$

26) $\frac{\frac{1}{2} \text{ t}}{1 \text{ dose}} = \frac{20 \text{ t}}{X \text{ doses}}$
 $\frac{1}{2} X = 20$
 $\frac{\frac{1}{2} X}{\frac{1}{2}} = \frac{20}{\frac{1}{2}}$
 $X = 20 \div \frac{1}{2} = 20 \times \frac{2}{1} = 40 \text{ doses}$

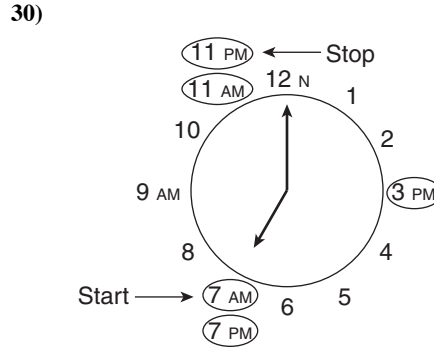
27) $3 \times 7 = 21 \text{ doses}$
 $21 \times 1\frac{1}{2} \text{ tablets} =$
 $21 \times \frac{3}{2} = \frac{63}{2} =$
 $31\frac{1}{2} \text{ tablets}$

28) $\frac{1}{3}$ full means the patient drank $\frac{2}{3}$ pitcher; $\frac{2}{3}$ pitcher = 850 mL

$\frac{\frac{2}{3} \text{ pitcher}}{850 \text{ mL}} \times \frac{1 \text{ pitcher}}{X \text{ mL}} = 1$
 $\frac{2}{3} X = 850$
 $\frac{\frac{2}{3} X}{\frac{2}{3}} = \frac{850}{\frac{2}{3}}$

$X = 850 \div \frac{2}{3} = 850 \times \frac{3}{2} = \frac{2550}{2} = 1,275 \text{ mL}$

29) $\frac{1 \text{ tube}}{\frac{7}{10} \text{ ounce}} \times \frac{75 \text{ tubes}}{X \text{ ounces}} = 75$
 $X = \frac{7}{10} \times 75 = \frac{105}{2}$
 $X = 52\frac{1}{2} \text{ ounces}$



Daily doses would be taken at: 7 AM, 11 AM, 3 PM, 7 PM, and 11 PM for 5 doses/day.

$5 \text{ doses/day} \times \frac{1}{2} \text{ ounce/dose} = \frac{5}{2} = 2\frac{1}{2} \text{ ounces/day}$
 $16 \text{ ounces} \div 2\frac{1}{2} \text{ ounces/day} = \frac{16}{1} \div \frac{5}{2} = \frac{16}{1} \times \frac{2}{5} = \frac{32}{5} = 6\frac{2}{5} \text{ days or 6 full days}$

Review Set 4 from pages 26-27

- 1) 0.2, two tenths 2) $\frac{17}{20}$, 0.85 3) $1\frac{1}{20}$, one and five hundredths 4) $\frac{3}{500}$, six thousandths 5) 10.015, ten and fifteen thousandths 6) $1\frac{9}{10}$, one and nine tenths 7) $5\frac{1}{10}$, 5.1 8) 0.8, eight tenths 9) $250\frac{1}{2}$, two hundred fifty and five tenths 10) 33.03, thirty-three and three hundredths 11) $\frac{19}{20}$, ninety-five hundredths 12) 2.75, two and seventy-five hundredths 13) $7\frac{1}{200}$, 7.005 14) 0.084, eighty-four thousandths 15) $12\frac{1}{8}$, twelve and one hundred twenty-five thousandths 16) $20\frac{9}{100}$, twenty and nine hundredths 17) $22\frac{11}{500}$, 22.022 18) $\frac{3}{20}$, fifteen hundredths 19) 1,000.005, one thousand and five thousandths 20) $4,085\frac{3}{40}$, 4,085.075 21) 0.0170 22) 0.25 23) 0.75 24) $\frac{9}{200}$ 25) 0.12 26) 0.063 27) False 28) False 29) True 30) 0.8 gram and 1.25 grams

Solutions—Review Set 4

- 1) Decimal

$$\frac{1}{5} = 5 \overline{) 1.0} \begin{array}{r} 0.2 \\ \underline{1.0} \\ 0 \end{array}$$

$$\frac{1}{5} = 0.2$$

Read: two tenths

- 2) Fraction

$$\frac{85}{100} = \frac{17}{20}$$

Decimal

$$\frac{85}{100} = 100 \overline{) 85.0} \begin{array}{r} 0.85 \\ \underline{80\ 0} \\ 5\ 00 \\ \underline{5\ 00} \\ 0 \end{array}$$

- 3) Fraction

$$1.05 = \frac{105}{100} = 1 \frac{5}{100} = 1 \frac{1}{20}$$

Read: one and five hundredths

- 4) Fraction

$$0.006 = \frac{6}{1,000} = \frac{3}{500}$$

Read: six thousandths

- 5) Decimal

$$10 \frac{3}{200} = \frac{2003}{200} = 200 \overline{) 2003.000} \begin{array}{r} 10.015 \\ \underline{200\ 0} \\ 03\ 0 \\ \underline{3\ 0} \\ 0\ 0 \\ \underline{3\ 00} \\ 2\ 00 \\ \underline{1\ 000} \\ 1\ 000 \\ \underline{1\ 000} \\ 0 \end{array}$$

Read: ten and fifteen thousandths

- 6) Fraction

$$1.9 = 1 \frac{9}{10}$$

Read: one and nine tenths

- 7) Fraction

$$\text{five and one tenth} = 5 \frac{1}{10}$$

Decimal

$$5 \frac{1}{10} = \frac{51}{10} = 10 \overline{) 51.0} \begin{array}{r} 5.1 \\ \underline{50\ 0} \\ 1\ 0 \end{array}$$

- 8) Decimal

$$\frac{4}{5} = 5 \overline{) 4.0} \begin{array}{r} 0.8 \\ \underline{4.0} \end{array}$$

Read: eight tenths

- 9) Fraction

$$250.5 = 250 \frac{5}{10} = 250 \frac{1}{2}$$

Read: two hundred fifty and five tenths

- 10) Decimal

$$33 \frac{3}{100} = \frac{3303}{100} = 100 \overline{) 3303.00} \begin{array}{r} 33.03 \\ \underline{300\ 0} \\ 303\ 0 \\ \underline{300\ 0} \\ 30\ 0 \\ \underline{30\ 0} \\ 0 \end{array}$$

Read: thirty-three and three hundredths

- 11) Fraction

$$0.95 = \frac{95}{100} = \frac{19}{20}$$

Read: ninety-five hundredths

- 12) Decimal

$$2 \frac{3}{4} = \frac{11}{4} = 4 \overline{) 11.00} \begin{array}{r} 2.75 \\ \underline{8\ 0} \\ 3\ 0 \\ \underline{2\ 8} \\ 20 \end{array}$$

Read: two and seventy-five hundredths

- 13) Fraction

$$\text{seven and five thousandths} = 7 \frac{5}{1,000} = 7 \frac{1}{200}$$

Decimal

$$7 \frac{5}{1,000} = \frac{7,005}{1,000} = 1,000 \overline{) 7,005.000} \begin{array}{r} 7.005 \\ \underline{7,000\ 0} \\ 50\ 0 \\ \underline{50\ 0} \\ 0 \end{array}$$

- 14) Decimal

$$\frac{21}{250} = 250 \overline{) 21.000} \begin{array}{r} 0.084 \\ \underline{20\ 00} \\ 1\ 000 \\ \underline{1\ 000} \end{array}$$

Read: eighty-four thousandths

- 15) Fraction

$$12.125 = 12 \frac{125}{1,000} = 12 \frac{1}{8}$$

Read: twelve and one hundred twenty-five thousandths

- 16) Fraction
 $20.09 = 20 \frac{9}{100}$
 Read: twenty and nine hundredths

- 17) Fraction
 twenty-two and twenty-two thousandths
 $= 22 \frac{22}{1,000} = 22 \frac{11}{500}$

Decimal

$$22 \frac{22}{1,000} = \frac{22,022}{1,000} = 1,000 \overline{) 22,022.000}$$

$$\begin{array}{r} 22.022 \\ \underline{20\ 00} \downarrow \\ 2\ 022 \\ \underline{2\ 000} \downarrow \\ 22\ 0 \\ \underline{0} \downarrow \\ 22\ 00 \\ \underline{20\ 00} \downarrow \\ 2\ 000 \\ \underline{2\ 000} \\ 0 \end{array}$$

- 18) Fraction
 $0.15 = \frac{15}{100} = \frac{3}{20}$
 Read: fifteen hundredths

- 19) Decimal
- $$1,000 \frac{1}{200} = \frac{200,001}{200} = 200 \overline{) 200,001.000}$$
- $$\begin{array}{r} 1,000.005 \\ \underline{200\ 00} \downarrow \\ 0\ 0 \\ \underline{0} \downarrow \\ 0\ 00 \\ \underline{0} \downarrow \\ 0\ 001 \\ \underline{0} \downarrow \\ 1\ 0 \\ \underline{1\ 00} \downarrow \\ 0 \\ \underline{1\ 000} \\ 1\ 000 \\ \underline{1\ 000} \\ 0 \end{array}$$

Read: one thousand and five thousandths

- 20) Fraction
 four thousand eighty-five and seventy-five thousandths
 $= 4,085 \frac{75}{1,000} = 4,085 \frac{3}{40}$

Decimal

$$4,085 \frac{75}{1,000} = 4,085 + 1,000 \overline{) 75.000} = 4,085.75$$

$$\begin{array}{r} .075 \\ \underline{70\ 00} \\ 5\ 000 \\ \underline{5\ 000} \\ 0 \end{array}$$

- 21) $0.017 = 0.0170$
 four place decimal

- 22) $0.2500 = 0.25$
 two place decimal

23) $\frac{75}{100} = 100 \overline{) 75.00}$

$$\begin{array}{r} 0.75 \\ \underline{70.0} \downarrow \\ 5.00 \end{array}$$

24) $0.045 = \frac{45}{1,000} = \frac{9}{200}$

↑ ↑ ↑
 tenths hundredths thousandths

- 25) 0.012
 0.120
 0.021
 ↑
 0.120 is the largest because the 1 in the tenth place > 0

- 26) 0.635
 0.6
 0.063
 ↑

0.063 is the smallest because 0 in the tenth place is the smallest

- 27) $0.375 \neq 0.0375$
 False

- 28) 2.2 grams \neq 2.02 grams
 False

- 29) 6.5 ounces = 6.500 ounces
 True

- 30) 0.5 gram is less than or equal to a safe dose is less than or equal to 2 grams
 Safe doses: 0.8 gram and 1.25 grams

Review Set 5 from pages 28-29

- 1) 22.585 2) 44.177 3) 12.309 4) 11.3 5) 175.199 6) 25.007 7) 0.518 8) \$9.48 9) \$18.91 10) \$22.71 11) 6.403 12) 0.27
 13) 4.15 14) 1.51 15) 10.25 16) 2.517 17) 374.35 18) 604.42 19) 27.449 20) 23.619 21) 0.697 gram 22) 18.55 ounces
 23) 2,058.06 24) 10.3 grams 25) 8.1 hours

Solutions—Review Set 5

$$\begin{array}{r} 1) \quad \overset{1}{0}.160 \\ \quad \quad 5.375 \\ \quad \quad 1.050 \\ +16.000 \\ \hline 22.585 \end{array}$$

$$\begin{array}{r} 2) \quad 7.517 \\ \quad \quad 3.200 \\ \quad \quad 0.160 \\ +33.300 \\ \hline 44.177 \end{array}$$

$$\begin{array}{r} 3) \quad \overset{2}{12}.\overset{10}{009} \\ \quad \quad -0.700 \\ \hline 12.309 \end{array}$$

$$\begin{array}{r} 4) \quad \overset{1}{0}5.125 \\ \quad \quad \overset{1}{0}6.025 \\ \quad \quad +0.150 \\ \hline 11.300 \\ 11.300 = 11.3 \end{array}$$

$$\begin{array}{r} 5) \quad 175.100 \\ \quad \quad +0.099 \\ \hline 175.199 \end{array}$$

$$\begin{array}{r} 6) \quad \overset{9}{17}.\overset{10}{000} \\ \quad \quad 25.200 \\ \quad \quad -0.193 \\ \hline 25.007 \end{array}$$

$$\begin{array}{r} 7) \quad \overset{7}{0}5.800 \\ \quad \quad -0.062 \\ \hline 0.518 \end{array}$$

$$\begin{array}{r} 8) \quad \overset{9}{\$}10.100 \\ \quad \quad -0.62 \\ \hline \$9.48 \end{array}$$

$$\begin{array}{r} 9) \quad \overset{8}{\$}19.000 \\ \quad \quad -0.09 \\ \hline \$18.91 \end{array}$$

$$\begin{array}{r} 10) \quad \overset{1}{\$}5.05 \\ \quad \quad 0.17 \\ +17.49 \\ \hline \$22.71 \end{array}$$

$$\begin{array}{r} 11) \quad \overset{1}{4}.\overset{1}{000} \\ \quad \quad 1.980 \\ \quad \quad 0.420 \\ +0.003 \\ \hline 6.403 \end{array}$$

$$\begin{array}{r} 12) \quad \overset{2}{0}.\overset{10}{00} \\ \quad \quad -0.03 \\ \hline 0.27 \end{array}$$

$$\begin{array}{r} 13) \quad \overset{2}{16}.\overset{10}{00} \\ \quad \quad -12.15 \\ \hline 4.15 \end{array}$$

$$\begin{array}{r} 14) \quad \overset{1}{2}.\overset{14}{00} \\ \quad \quad -0.99 \\ \hline 1.51 \end{array}$$

$$\begin{array}{r} 15) \quad \overset{1}{5}.\overset{1}{00} \\ \quad \quad 2.50 \\ \quad \quad 0.05 \\ \quad \quad 0.15 \\ +2.55 \\ \hline 10.25 \end{array}$$

$$\begin{array}{r} 16) \quad \overset{1}{0}030 \\ \quad \quad 0.160 \\ +2.327 \\ \hline 2.517 \end{array}$$

$$\begin{array}{r} 17) \quad \overset{6}{7}00.\overset{9}{00} \\ \quad \quad -325.65 \\ \hline 374.35 \end{array}$$

$$\begin{array}{r} 18) \quad \overset{4}{64}5.\overset{13}{00} \\ \quad \quad -40.90 \\ \hline 604.42 \end{array}$$

$$\begin{array}{r} 19) \quad \overset{1}{18}.\overset{1}{000} \\ \quad \quad 2.350 \\ \quad \quad 7.006 \\ +0.093 \\ \hline 27.449 \end{array}$$

4) $\frac{D}{H} \times Q = \frac{1}{20 \text{ mg}} \times 1 \text{ tab} = 1 \text{ tab}$

5) $0.25 \text{ mg} = \underline{0.250} = 250 \text{ mcg}$

$$\frac{D}{H} \times Q = \frac{1}{\frac{250 \text{ mcg}}{500 \text{ mcg}}} \times 2 \text{ mL} = \frac{1}{2} \text{ mL} = 1 \text{ mL}$$

0.25 mg = 1 mL added to 4 mL NS = 5 mL total

$$\frac{1}{5 \text{ mL}} \times \frac{5 \text{ mL}}{5 \text{ min}} = 1 \text{ mL/min}$$

$$\frac{1 \text{ mL}}{60 \text{ sec}} \times \frac{X \text{ mL}}{15 \text{ sec}}$$

$$60X = 15$$

$$\frac{60X}{60} = \frac{15}{60}$$

$$X = 0.25 \text{ mL (per 15 sec)}$$

6) $0.125 \text{ mg} = \underline{0.125} = 125 \text{ mcg}$

$$\frac{D}{H} \times Q = \frac{1}{\frac{125 \text{ mcg}}{250 \text{ mcg}}} \times 1 \text{ tab} = \frac{1}{2} \text{ tab}$$

Daily means you will need $\frac{1}{2}$ tab per 24 h.

7) $\frac{\text{mL/h}}{\text{drop factor constant}} = \text{gtt/min}$

$$\frac{80 \text{ mL/h}}{1} = 80 \text{ gtt/min or}$$

80 mL/h = 80 gtt/min (because drop factor is

60 gtt/mL)

8) $\frac{D}{H} \times Q = X$

$$\frac{D \text{ mEq/h}}{10 \text{ mEq}} \times 1,000 \text{ mL} = 80 \text{ mL/h}$$

$$\frac{D}{10} \times 1,000 = 80$$

$$\frac{1,000D}{10} = \frac{80}{1}$$

$$1,000D = 800$$

$$\frac{1,000D}{1,000} = \frac{800}{1,000}$$

$$D = 0.8 \text{ mEq/h}$$

9) $0.8 \text{ mEq/h} \times 24 \text{ h} = 19.2 \text{ mEq}$

10) $80 \text{ mL/h} \times 24 \text{ h} = 1,920 \text{ mL}$

11) $\frac{1,000 \text{ mL}}{80 \text{ mL/h}} = 12.5 \text{ h} = 12 \text{ h } 30 \text{ min}$

1630 hours + 12 h 30 min later = 0500 hours the next day

12) $1 \text{ g} = 1,000 \text{ mg}$

$$\frac{D}{H} \times Q = \frac{1,000 \text{ mg}}{\frac{2}{500 \text{ mg}}} \times 1 \text{ tab} = 2 \text{ tab}$$

13) Order is for 80 mL/h—this is the setting for the controller.

14) nitroglycerin, furosemide, KCl

15) $\frac{D}{H} \times Q = \frac{5}{\frac{50 \text{ mg}}{10 \text{ mg}}} \times 1 \text{ mL} = 5 \text{ mL}$

16) $\frac{D}{H} \times Q = \frac{2 \text{ mg/min}}{\frac{2,000 \text{ mg}}{4}} \times \frac{1}{500} \text{ mL} = \frac{2}{4} = 0.5 \text{ mL/min}$

$$0.5 \text{ mL/min} \times 60 \text{ min/h} = 30 \text{ mL/h}$$

17) $110 \text{ lb} \div 2.2 \text{ lb/kg} = 50 \text{ kg}$

Minimum: $5 \text{ mcg/kg/min} \times 50 \text{ kg} = 250 \text{ mcg/min}$

Maximum: $10 \text{ mcg/kg/min} \times 50 \text{ kg} = 500 \text{ mcg/min}$

Ordered dosage is safe.

$$\frac{D}{H} \times Q = \frac{5}{\frac{400 \text{ mg}}{80 \text{ mg}}} \times 1 \text{ mL} = 5 \text{ mL}$$

18) $500 \text{ mcg/min} = \underline{.500} = 0.5 \text{ mg/min}$

$$\frac{D}{H} \times Q = \frac{0.5 \text{ mg/min}}{\frac{400 \text{ mg}}{8}} \times \frac{5}{250} \text{ mL} = \frac{2.5 \text{ mL}}{8 \text{ min}}$$

$$= 0.312 \text{ mL/min} = 0.31 \text{ mL/min}$$

$$0.31 \text{ mL/min} \times 60 \text{ min/h} = 18.6 \text{ mL/h} = 19 \text{ mL/h}$$

19) $500 \text{ mcg/min} \times 60 \text{ min/h} = 30,000 \text{ mcg/h}$

$$30,000 \text{ mcg/h} = \underline{30,000} = 30 \text{ mg/h}$$

20) $\frac{D}{H} \times Q = \frac{4 \text{ mg/min}}{\frac{2,000 \text{ mg}}{4}} \times \frac{1}{500} \text{ mL} = \frac{4}{4} = 1 \text{ mL/min}$

$$1 \text{ mL/min} \times 60 \text{ min/h} = 60 \text{ mL/h}$$

21) $33 \text{ lb} \div 2.2 \text{ lb/kg} = 15 \text{ kg}$

$$15 \text{ mg/kg/day} \times 15 \text{ kg} = 225 \text{ mg/day}$$

Maximum: $\frac{225 \text{ mg}}{3 \text{ doses}} = 75 \text{ mg/dose}$

The order is safe.

$$\frac{D}{H} \times Q = \frac{1}{\frac{75 \text{ mg}}{75 \text{ mg}}} \times 2 \text{ mL} = 2 \text{ mL}$$

25 mL total IV solution – 2 mL Kantrex = 23 mL

$D_5 \frac{1}{2}$ NS

25 mL (total solution) + 15 mL (flush) = 40 mL

(total in 1 h)

40 mL over 1 h is 40 mL/h.

22) $\frac{D}{H} \times Q = \frac{3}{\frac{15 \text{ mg/h}}{25}} \times 100 \text{ mL} = \frac{3 \text{ h}}{25} \times \frac{4}{100} \text{ mL} = 12 \text{ mL/h}$

$$23) \quad 66 \cancel{\text{lb}} \div 2.2 \cancel{\text{lb}}/\text{kg} = 30 \text{ kg}$$

$$40 \text{ mg}/\cancel{\text{kg}}/\text{day} \times 30 \cancel{\text{kg}} = 1,200 \text{ mg}/\text{day}$$

$$\frac{1,200 \text{ mg}}{4 \text{ doses}} = 300 \text{ mg}/\text{dose}$$

$$\frac{D}{H} \times Q = \frac{300 \cancel{\text{mg}}}{500 \cancel{\text{mg}}} \times \frac{1}{10} \text{ mL} = \frac{300}{500} \text{ mL} = 6 \text{ mL}$$

$$50 \text{ mL (total IV volume)} - 6 \text{ mL vancomycin} =$$

$$44 \text{ mL (D}_5 \frac{1}{2} \text{ NS)}; 50 \text{ mL}/\cancel{\text{h}} \times 24 \cancel{\text{h}} = 1,200 \text{ mL}$$

$$24) \quad \text{Child weighs } 30 \text{ kg.}$$

$$100 \text{ mL}/\cancel{\text{kg}}/\text{day} \times 10 \cancel{\text{kg}} = 1,000 \text{ mL}/\text{day}$$

(for first 10 kg)

$$50 \text{ mL}/\cancel{\text{kg}}/\text{day} \times 10 \cancel{\text{kg}} = 500 \text{ mL}/\text{day}$$

(for next 10 kg)

$$20 \text{ mL}/\cancel{\text{kg}}/\text{day} \times 10 \cancel{\text{kg}} = 200 \text{ mL}/\text{day}$$

(for remaining 10 kg)

$$\text{Total: } 1,000 \text{ mL}/\text{day} + 500 \text{ mL}/\text{day} + 200 \text{ mL}/\text{day}$$

$$= 1,700 \text{ mL}/\text{day} \text{ or per } 24 \text{ h}$$

$$\frac{1,700 \text{ mL}}{24 \text{ h}} = 70.8 \text{ mL}/\text{h} = 71 \text{ mL}/\text{h}$$

The ordered rate is less than the recommended daily rate of maintenance fluids. The nurse should

consider possible clinical reasons for the difference and consult the physician as needed for clarification.

- 25) The vial size is 1.5 g. Choose the diluent that corresponds to the vial chosen. Adding 3.2 mL will yield a total of 4.0 mL containing 1.5 g.

2/6/xx, 0800, reconstituted as
1.5 g in 4 mL. Expires 2/9/xx, 0800.
Keep refrigerated. G.D.P.

$$27) \quad \frac{D}{H} \times Q = \frac{1}{\frac{500 \cancel{\text{mg}}}{1,500 \cancel{\text{mg}}}} \times 4 \text{ mL} = \frac{4}{3} \text{ mL} = 1.3 \text{ mL}$$

$$28) \quad \frac{50 \text{ mL}}{\frac{30 \cancel{\text{min}}}{1}} \times \frac{2}{\frac{60 \cancel{\text{min}}}{1 \text{ h}}} = 100 \text{ mL}/\text{h}$$

$$29) \quad \frac{D}{H} \times Q = \frac{2}{\frac{10,000 \cancel{\text{units}}}{5,000 \cancel{\text{units}}}} \times 1 \text{ mL} = 2 \text{ mL}$$

$$\frac{D}{H} \times Q = \frac{1,200 \cancel{\text{units}}/\text{h}}{\frac{10,000 \cancel{\text{units}}}{20}} \times 500 \text{ mL} = \frac{1,200}{20} \text{ mL}/\text{h}$$

$$= 60 \text{ mL}/\text{h}$$

$$30) \quad 125 \cancel{\text{lb}} \div 2.2 \cancel{\text{lb}}/\text{kg} = 56.81 \text{ kg} = 56.8 \text{ kg}$$

$$80 \text{ units}/\cancel{\text{kg}} \times 56.8 \cancel{\text{kg}} = 4,544 \text{ units}$$

$$\frac{D}{H} \times Q = \frac{4,544 \cancel{\text{units}}}{1,000 \cancel{\text{units}}} \times 1 \text{ mL} = 4.544 \text{ mL} = 4.6 \text{ mL}$$

$$18 \text{ units}/\cancel{\text{kg}}/\text{h} \times 56.8 \cancel{\text{kg}} = 1,022.4 \text{ units}/\text{h}$$

$$= 1,022 \text{ units}/\text{h}$$

$$\frac{D}{H} \times Q = \frac{1,022 \cancel{\text{units}}/\text{h}}{\frac{25,000 \cancel{\text{units}}}{100}} \times \frac{1}{250} \text{ mL} = 10.22 \text{ mL}/\text{h}$$

$$= 10 \text{ mL}/\text{h}$$

$$31) \quad \text{Decrease rate by } 2 \text{ units}/\text{kg}/\text{h}$$

$$2 \text{ units}/\cancel{\text{kg}}/\text{h} \times 56.8 \cancel{\text{kg}} = 113.6 \text{ units}/\text{h} = 114 \text{ units}/\text{h}$$

$$1,022 \text{ units}/\text{h} - 114 \text{ units}/\text{h} = 908 \text{ units}/\text{h}$$

$$\frac{D}{H} \times Q = \frac{908 \cancel{\text{units}}/\text{h}}{\frac{25,000 \cancel{\text{units}}}{100}} \times \frac{1}{250} \text{ mL} = 9.08 \text{ mL}/\text{h}$$

$$= 9 \text{ mL}/\text{h}$$

$$32) \quad \frac{D}{H} \times Q = \frac{8 \cancel{\text{units}}}{100 \cancel{\text{units}}} \times 1 \text{ mL} = 0.08 \text{ mL}$$

$$33) \quad 15 \text{ units} + 45 \text{ units} = 60 \text{ units}$$

$$34) \quad \frac{D}{H} \times Q = \frac{3}{\frac{300 \cancel{\text{units}}}{100 \cancel{\text{units}}}} \times 1 \text{ mL} = 3 \text{ mL}$$

$$\text{Total IV volume: } 150 \text{ mL (NS)} + 3 \text{ mL (insulin)} =$$

$$153 \text{ mL}$$

$$\frac{D}{H} \times Q = R$$

$$\frac{D \cancel{\text{units}}/\text{h}}{300 \cancel{\text{units}}} \times 153 \text{ mL} = 10 \text{ mL}/\text{h}$$

$$\frac{D}{300} \times 153 = 10$$

$$\frac{153D}{300} = \frac{10}{1}$$

$$153D = 3,000$$

$$\frac{153D}{153} = \frac{3,000}{153}$$

$$D = 19.6 \text{ units}/\text{h} = 20 \text{ units}/\text{h}$$

$$35) \quad 8 \cancel{\text{fl oz}} \times 30 \text{ mL}/\cancel{\text{fl oz}} = 240 \text{ mL}$$

$$D \times Q = X$$

$$\frac{1}{4} \times Q = 240 \text{ mL}$$

$$\frac{1}{4} Q = 240 \text{ mL}$$

$$\frac{1}{4} Q = \frac{240}{\frac{1}{4}}$$

$$Q = 240 \times \frac{4}{1}$$

$$Q = 960 \text{ mL (total volume of reconstituted } \frac{1}{4} \text{ strength Isomil)}$$

$$960 \text{ mL (total solution)} - 240 \text{ mL (solute or Isomil)}$$

$$= 720 \text{ mL solvent or water}$$

$$36) \quad 16 \cancel{\text{lb}} \div 2.2 \cancel{\text{lb}}/\text{kg} = 7.27 \text{ kg} = 7.3 \text{ kg}$$

$$100 \text{ mL}/\cancel{\text{kg}}/\text{day} \times 7.3 \cancel{\text{kg}} = 730 \text{ mL}/\text{day}$$

$$730 \text{ mL}/\cancel{\text{day}} \div 24 \cancel{\text{h}}/\cancel{\text{day}} = 30.4 = 30 \text{ mL}/\text{h}$$

$$37) 5 \text{ ft} \times 12 \text{ in/ft} = 60 \text{ in}; 60 \text{ in} + 2 \text{ in} = 62 \text{ in}$$

Household:

$$\text{BSA (m}^2\text{)} = \sqrt{\frac{\text{ht (in)} \times \text{wt (lb)}}{3,131}} = \sqrt{\frac{62 \times 103}{3,131}} = \sqrt{\frac{6,386}{3,131}}$$

$$= \sqrt{2.039\dots} = 1.428 \text{ m}^2 = 1.43 \text{ m}^2$$

$$38) 10 \text{ mg/m}^2 \times 1.43 \text{ m}^2 = 14.3 \text{ mg}$$

$$20 \text{ mg/m}^2 \times 1.43 \text{ m}^2 = 28.6 \text{ mg}$$

Yes, the order is safe.

$$39) \text{Concentration: } 40 \text{ mg}/80 \text{ mL} = 0.5 \text{ mg/mL}$$

$$\frac{D}{H} \times Q = \frac{28 \text{ mg}}{0.5 \text{ mg}} \times 1 \text{ mL} = 56 \text{ mL}$$

$$\frac{56 \text{ mL}}{10 \text{ min}} = 5.6 \text{ mL/min (or 5.6 mL per 60 sec)}$$

$$\frac{5.6 \text{ mL}}{60 \text{ sec}} \times \frac{X \text{ mL}}{15 \text{ sec}}$$

$$60X = 84$$

$$\frac{60X}{60} = \frac{84}{60}$$

$$X = 1.4 \text{ mL (per 15 sec)}$$

$$40) \text{Dextrose:}$$

$$\frac{5 \text{ g}}{100 \text{ mL}} \times \frac{X \text{ g}}{1,000 \text{ mL}}$$

$$100X = 5,000$$

$$\frac{100X}{100} = \frac{5,000}{100}$$

$$X = 50 \text{ g}$$

$$\text{NaCl:}$$

$$\frac{0.45 \text{ g}}{100 \text{ mL}} \times \frac{X \text{ g}}{1,000 \text{ mL}}$$

$$100X = 450$$

$$\frac{100X}{100} = \frac{450}{100}$$

$$X = 4.5 \text{ g}$$

$$41) \frac{D}{H} \times Q = \frac{540 \text{ mg}}{250 \text{ mg}} \times 1 \text{ mL} = 2.16 \text{ mL} = 2.2 \text{ mL}$$

50 mL – 2.2 mL = 47.8 mL (IV fluid). Note: Add the medicine to the chamber and then add IV fluid up to 50 mL.

$$42) \frac{40 \text{ mg}}{1 \text{ mL}} \times \frac{540 \text{ mg}}{X \text{ mL}}$$

$$40X = 540$$

$$\frac{40X}{40} = \frac{540}{40}$$

$$X = 13.5 \text{ mL}$$

$$43) 400,000 \text{ units/dose} \times 4 \text{ doses/day} = 1,600,000 \text{ units/day}$$

$$\text{Minimum: } 150,000 \text{ units/kg/day} \times 10 \text{ kg} = 1,500,000 \text{ units/day}$$

$$\text{Maximum: } 250,000 \text{ units/kg/day} \times 10 \text{ kg} = 2,500,000 \text{ units/day}$$

Reconstitute with 1.8 mL for a concentration of 500,000 units/mL. This concentration is selected because it will be further diluted.

$$\frac{D}{H} \times Q = \frac{400,000 \text{ units}}{500,000 \text{ units}} \times 1 \text{ mL} = \frac{4}{5} \text{ mL}$$

$$= 0.8 \text{ mL penicillin}$$

$$44) 100 \text{ mL (NS)} + 0.8 \text{ mL (penicillin)} = 100.8 \text{ or } 101 \text{ mL to be infused in 60 min or 1 h. Set IV pump at 101 mL/h.}$$

$$45) \text{The primary IV will infuse for 8 hours. The IV PB will infuse for 30 minutes. Therefore, the primary IV will be interrupted by the IV PB and then will resume. The IV will be completely infused in 8 hours and 30 min.}$$

$$(1315 + 8 \text{ h } 30 \text{ min} = 1315 + 0830 = 2145)$$

$$46) \frac{D}{H} \times Q = \frac{1}{28 \text{ mg}} \times \frac{28 \text{ mg}}{50 \text{ mg}} \times 1 \text{ mL} = \frac{1}{2} \text{ mL} = 0.5 \text{ mL}$$

$$47) \frac{D}{H} \times Q = \frac{3}{1,500 \text{ mg}} \times \frac{2,000 \text{ mg}}{4} \times 10 \text{ mL} = \frac{3}{4} \times \frac{5}{10} \text{ mL} = \frac{15}{2} \text{ mL}$$

$$= 7.5 \text{ mL}$$

$$48) \frac{100 \text{ mL}}{30 \text{ min}} \times \frac{2}{60 \text{ min}} \times \frac{1 \text{ h}}{1} = 200 \text{ mL/h}$$

49) **Prevention:** Either the route or the frequency of this order is missing or is unclear. If the student actually gave this medication in the eye, it would cause a severe reaction. The medication particles could scratch the eyes or cause a worse reaction, such as blindness.

To prevent this from occurring, the student/nurse should always ensure that each medication order is complete. Every order should include the name of the drug, the dose, the route, and the time (with the patient, prescriber, and licensure identified). When any of these is missing, the order should be clarified. Further, the “od” abbreviation is obsolete and discouraged by The Joint Commission. The student nurse should also look medications up and know the safe use for each medication ordered. Had this student looked Lanoxin up in a drug guide, the student would have discovered that the medication is never given in the eye.

50) **Prevention:** The student nurse took the correct action with this order. The nurses who had given the medication previously should have looked up the medication if they were unfamiliar with it to safely identify whether it was ordered by an appropriate route, correct dose, and correct time. There was also an error made by the pharmacist who supplied the medication to the nursing unit. It is extremely important to be familiar with the medications being given. If there's a question or any doubt, the medication should be looked up in a drug guide and/or the prescriber questioned. Also, close reading of the label and matching it to the order is also extremely important. Remember the six rights of medication administration at all times when giving medication.

