Dosage Calculations (Canadian) 4th edition Pickar Solutions Manual

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Chapter 2: Ratios and Percents

Review Set 2-1 (page 50)

1. $3:150 = \frac{3}{150} = \mathbf{\frac{1}{50}}$

2. $6:10 = \frac{6}{10} = \mathbf{\frac{3}{5}}$

3. $0.05:0.15 = \frac{0.05}{0.15} = \mathbf{\frac{1}{3}}$

4. $20:40 = \frac{20}{40} = \frac{1}{2} = \mathbf{0.5}$

5. $\frac{1}{1000}:\frac{1}{150} = \frac{\frac{1}{1000}}{\frac{1}{150}} = \frac{1}{1000} \div \frac{1}{150} = \frac{1}{\cancel{1000}_{20}} \times \frac{\cancel{150}^{3}}{1} = \frac{3}{20} = \mathbf{0.15}$

$$
\begin{array}{r|l}
 & 0.15 \\
\hline
20 & 3.00 \\
 & \underline{20} \\
 & 100 \\
 & \underline{100} \\
 & 0
\end{array}
$$

6. $0.3:4.5 = \frac{0.3}{4.5} = \mathbf{0.07}$

$$
\begin{array}{r|l}
 & 0.066 \\
\hline
4.5 & 0.3000 \\
 & \underline{270} \\
 & 300 \\
 & \underline{270} \\
 & 30
\end{array}
$$

7. $1\frac{1}{2}:6\frac{2}{9} = \frac{1\frac{1}{2}}{6\frac{2}{9}} = 1\frac{1}{2} \div 6\frac{2}{9} = \frac{3}{2} \div \frac{56}{9} = \frac{3}{2} \times \frac{9}{56} = \frac{27}{112} = \mathbf{0.24}$

$$
\begin{array}{r|l}
 & 0.241 \\
\hline
112 & 27.000 \\
 & \underline{224} \\
 & 460 \\
 & \underline{448} \\
 & 120 \\
 & \underline{112} \\
 & 8
\end{array}
$$

8. $12:48 = \frac{12}{48} = \frac{1}{4} = 0.25 = \mathbf{25}\%$

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9. $0.08 : 0.64 = \frac{0.08}{0.64} = 0.125 = \mathbf{12.5\%}$

$$
\begin{array}{r}
0.125 \\
0.64\overline{)\,0.08.000} \\
\underline{64} \\
160 \\
\underline{128} \\
320 \\
\underline{320} \\
0
\end{array}
$$

10. $7 : 10 = \frac{7}{10} = 0.7 = \mathbf{70\%}$

11. $50 : 100 = \frac{50}{100} = \mathbf{50\%}$

12. $45\% = \frac{45}{100} = \mathbf{\frac{9}{20}}$

13. $0.5\% = 0.005 = \frac{5}{1000} = \mathbf{\frac{1}{200}}$

14. $1\% = 0.01 = \mathbf{\frac{1}{100}}$

15. $66\frac{2}{3}\% = \frac{200}{3}\% = \frac{200}{3} \div 100 = \frac{\overset{2}{\cancel{200}}}{3} \times \frac{1}{\underset{1}{\cancel{100}}} = \mathbf{\frac{2}{3}}$

16. $2.94\% = 2.94 \div 100 = 0.0294 = \mathbf{0.03}$

17. $33\% = 33 \div 100 = \mathbf{0.33}$

18. $0.9\% = 0.9 \div 100 = 0.009 = \mathbf{0.01}$

19. $16\% = \frac{16}{100} = \frac{4}{25} = \mathbf{4:25}$

20. $25\% = \frac{25}{100} = \frac{1}{4} = \mathbf{1:4}$

21. $50\% = \frac{50}{100} = \frac{1}{2} = \mathbf{1:2}$

22. $0.9\% = 0.9 \div 100 =$ 0.009
$0.9 =$ **0.900 is largest**
$1:9 = \frac{1}{9} = 1 \div 9 =$ 0.110
$\frac{1}{90} = 1 \div 90 =$ 0.011

23. $0.05 =$ 0.050
$\frac{200}{400} = 200 \div 400 = 0.5 =$ **0.500 is largest**
$0.025 =$ 0.025
$1:25 = \frac{1}{25} = 0.04 = 0.040 =$ 0.040

$$
\begin{array}{r}
0.5 \\
400\overline{)\,200} \\
\underline{200} \\
0
\end{array}
\qquad
\begin{array}{r}
0.04 \\
25\overline{)\,1.00} \\
\underline{100} \\
0
\end{array}
$$

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24. $0.0125\% \div 100 = \quad 0.000125$

$0.25\% = 0.25 \div 100 = \quad \mathbf{0.002500\ is\ largest}$

$0.1\% = 0.1 \div 100 = \quad 0.001000$

$0.02\% = 0.02 \div 100 = \quad 0.002000$

25. $\frac{1}{150} = 0.007$

$\frac{1}{300} = \ 0.003$

$0.5 = \ \mathbf{0.500\ is\ largest}$

$\frac{2}{3}\% = 0.067$

$$\begin{array}{r} 0.0066 \\ 150\overline{)1.0000} \\ \underline{900} \\ 1000 \\ \underline{900} \\ 100 \end{array} \qquad \begin{array}{r} 0.0033 \\ 300\overline{)1.0000} \\ \underline{900} \\ 1000 \\ \underline{900} \\ 100 \end{array}$$

$\frac{2}{3}\% = \frac{2}{3} \div 100 = \frac{2}{3} \times \frac{1}{100} = \frac{2}{300}$

$$\begin{array}{r} 0.0066 \\ 300\overline{)2.0000} \\ \underline{1800} \\ 2000 \\ \underline{1800} \\ 200 \end{array}$$

Review Set 2-2 (page 52)

1. X = 0.25% × 520
   X = 0.0025 × 520
   X **= 1.3**

2. X = 5% × 95
   X = 0.05 × 95
   X **= 4.75**

3. X = 40% × 140
   X = 0.4 × 140
   X **= 56**

4. X = 0.7% × 62
   X = 0.007 × 62
   X **=** 0.434 = **0.43**

5. X = 3% × 889
   X = 0.03 × 889
   X **= 26.67**

6. X = 20% × 75
   X = 0.2 × 75
   X **= 15**

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7. X = 4% × 20
   X = 0.04 × 20
   X **= 0.8**

8. X = 7% × 34
   X = 0.07 × 34
   X **= 2.38**

9. X = 15% × 250
   X = 0.15 × 250
   X **= 37.5**

10. X = 75% × 150
    X = 0.75 × 150
    X **= 112.5**

11. X = 40% × 20
    X = 0.4 × 20
    X **= 8 tablets**

12. X = 60% × 1200
    X = 0.60 × 1200
    X **= 720 mL**

13. X = 80% of $17 651.07
    X = 0.8 × $17 651.07
    X = $14 120.86

$ 17 651.07	total bill
- 14 120.86	paid by insurance company
$ **3530.21**	paid by patient

14. X = 40% × 750
    X = 0.4 × 750
    X **= 300 g**

15. X = 20% × 3500
    X = 0.2 × 3500
    X **= 700 calories**

Practice Problems—Chapter 2 (pages 52–54)

1. $\mathbf{0.4\ ,\ 40\%,\ 2:5}$ $\frac{2}{5} = \begin{array}{r} 0.4 \\ 5\overline{)2.0} \\ \underline{20} \\ 0 \end{array}$ $0.4 \quad 0.40 = 40\%$

2. $\mathbf{\frac{1}{20}, 5\%, 1:20}$ $0.5 = \frac{5}{100} = \frac{1}{20}$ $0.05 \quad 0.05 = 5\%$

3. $\mathbf{0.17, \frac{17}{100}, 17:100}$ $17\% = \frac{17}{100} = 0.17$

4. $\mathbf{0.25, \frac{1}{4}, 25\%}$ $1{:}4 = \frac{1}{4} = \begin{array}{r} 0.25 \\ 4\overline{)1.00} \end{array}$ $0.25 \quad 0.25 = 25\%$

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5. **$0.06, \frac{3}{50}, 3:50$** $6\% = \frac{6}{100} = \frac{3}{50}$ 6% $06\% = 0.06$

6. **0.17, 17%, $1:6$** $\frac{1}{6} =$

$$6\overline{)1.000}\quad 0.166$$
6, 40, 36, 40, 36, 4

$0.166 = 0.17$ $0.17 = 17\%$

7. **$0.5, \frac{1}{2}, 1:2$** $50\% = \frac{50}{100} = \frac{1}{2} = 1:2$

$50\% = 0.5$

8. **$0.01, \frac{1}{100}, 1\%$** $1:100 = \frac{1}{100}$

$1\% = 01\% = 0.01$

9. **$\frac{9}{100}$, 9%, $9:100$** $0.09 = \frac{9}{100}$

0.09 $0.09 = 9\%$

10. **0.38, 38%, $3:8$** $\frac{3}{8} =$

$$8\overline{)3.000}\quad 0.375$$
24, 60, 56, 40, 36, 4

$0.375 = 0.38$ $0.38 = 38\%$

11. **$0.67, \frac{2}{3}, 67\%$** $2:3 = \frac{2}{3} =$

$$3\overline{)2.000}\quad 0.666$$
18, 20, 18, 20, 18, 2

$0.666 = 0.67$ $0.67 = 67\%$

12. **0.33, 33%, $1:3$** $\frac{1}{3} =$

$$3\overline{)1.000}\quad 0.333$$
9, 10, 9, 10, 9, 1

$0.333 = 0.33$ $0.33 = 33\%$

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13. $\mathbf{\frac{13}{25}, 52\%, 13:25}$ $0.52 = \frac{52}{100} = \frac{13}{25}$

0.52 $0.52 = 52\%$

14. $\mathbf{0.45, \frac{9}{20}, 45\%}$ $9:20 = \frac{9}{20} =$ 0.45 / $20\overline{)9.00}$ — 80, 100, 100, 0 0.45 $0.45 = 45\%$

15. $\mathbf{0.86, 86\%, 6:7}$ $\frac{6}{7} =$ 0.857 / $7\overline{)6.000}$ — 56, 40, 35, 50, 49, 1 0.86 $0.86 = 86\%$

16. $\mathbf{0.3, \frac{3}{10}, 30\%}$ $3:10 = \frac{3}{10} =$ 0.3 / $10\overline{)3.0}$ 0.3 $0.3 = 3\%$

17. $\mathbf{0.02, 2\%, 1:50}$ $\frac{1}{50} =$ 0.02 / $50\overline{)1.00}$ — 100, 0 0.02 $0.02 = 2\%$

18. $\mathbf{\frac{3}{50}, 6\%, 3:50}$ $0.06 = 6\%$ $0.06 = \frac{6}{100} = \frac{3}{50}$

19. $\mathbf{\frac{1}{25}, 4\%, 1:25}$ $0.04 = 4\%$ $4\% = \frac{4}{100} = \frac{1}{25}$

20. $\mathbf{0.1, \frac{1}{10}, 1:10}$ $10\% = \frac{10}{100} = \frac{1}{10}$ 0.1 / $10\overline{)1.0}$ — 10, 0

21. $1:25 = \frac{1}{25} =$ $\mathbf{0.04}$ 0.04 / $25\overline{)1.00}$ — 100, 0

22. $\frac{10}{400} = \frac{1}{40} =$ $\mathbf{1:40}$

23. 0.075 $0.075 = \mathbf{7.5\%}$

24. $17:34 = \frac{17}{34} = \mathbf{\frac{1}{2}}$

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25. $75\% = \frac{75}{100} = \frac{3}{4} = \mathbf{3:4}$

26. $X = 35\% \times 750$
    $X = 0.35 \times 750$
    $\mathbf{X = 262.5}$

```
  750
× 0.35
 3750
2250
262.5
```

27. $X = 7\% \times 52$
    $X = 0.07 \times 52$
    $\mathbf{X = 3.64}$

28. $X = 8.3\% \times 24$
    $X = 0.083 \times 24$
    $\mathbf{X = 1.99}$

29. $1:40 = \frac{1}{40} = 0.025$

```
   0.025
40|1.000
  80
  200
  200
    0
```

$1:400 = \frac{1}{400} = 0.0025$

```
    0.0025
400|1.0000
  800
  2000
  2000
     0
```

$1:4 = \frac{1}{4} = 0.25$

```
   0.25
4|1.00
  8
  20
  20
   0
```

1:4 is the strongest solution.

30. $\frac{1}{10} = 0.1$

```
   0.1
10|1.0
  10
   0
```

$\frac{1}{200} = 0.005$

```
    0.005
200|1.000
  1000
     0
```

$\frac{1}{50} = 0.02$

```
   0.02
50|1.00
  100
    0
```

$\frac{1}{10}$ is the strongest solution.

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31. $1680 \times \frac{20}{400} = 1680 \times \frac{1}{20} = \frac{1680}{20} = \frac{168}{2} = \mathbf{84}$

32. $\frac{4}{75} \div \frac{1}{300} = \frac{4}{75} \times \frac{300}{1} = \frac{1200}{75} = \mathbf{16}$

$$
\begin{array}{r}
16 \\
75\overline{)1200} \\
\underline{75} \\
450 \\
\underline{450} \\
0
\end{array}
$$

33. $\frac{3}{15} \times 5 = \frac{15}{15} = \mathbf{1}$

34. $2.2 \times 250 \div 500 = 550 \div 500 = \frac{550}{500} = \mathbf{1.1}$

$$
\begin{array}{r}
1.1 \\
500\overline{)550.0} \\
\underline{500} \\
500 \\
\underline{500} \\
0
\end{array}
$$

35. $0.6 \times \frac{200}{1.2} = \frac{120}{1.2} = \mathbf{100}$

$$
\begin{array}{r}
100 \\
1.2\overline{)120.0} \\
\underline{12} \\
000
\end{array}
$$

36. $11\frac{7}{9} \times 3 = \frac{106}{9} \times 3 = \frac{318}{9} = \mathbf{35.33}$

$$
\begin{array}{r}
35.33 \\
9\overline{)318.00} \\
\underline{27} \\
48 \\
\underline{45} \\
30 \\
\underline{27} \\
30 \\
\underline{27} \\
3
\end{array}
$$

37. $\frac{1}{8} \div \frac{1}{3} \times 2 = \frac{1}{8} \times \frac{3}{1} \times 2 = \frac{3}{8} \times 2 = \frac{6}{8} = \mathbf{0.75}$

$$
\begin{array}{r}
0.75 \\
8\overline{)6.00} \\
\underline{56} \\
40 \\
\underline{40} \\
0
\end{array}
$$

38. $\frac{7}{4} \times 12 = \mathbf{21}$

39. $\frac{9}{0.6} \times 8 = \frac{72}{0.6} = \mathbf{120}$

$$
\begin{array}{r}
120 \\
0.6\overline{)72.0} \\
\underline{6} \\
12 \\
\underline{12} \\
00
\end{array}
$$

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40. $\frac{0.4}{0.1} \times 22.5 = 4 \times 22.5 =$ **90**

41. $\frac{3}{8} \times 368 =$ **138 nurses**

    $\frac{1}{8} \times 368 =$ **46 maintenance/cleaners**

    $\frac{1}{4} \times 368 =$ **92 technicians and 92 others**

42. $125 \times 0.2 =$ **25 g protein**

    $125 \times 0.05 =$ **6.25 g fat**

```
  125
× 0.2
 25.0  = 25

  125
× 0.05
 6.25  = 6.25
```

43. $308 \times 0.75 =$ **231 points needed to pass**

```
  308
× 0.75
 2156
1540
231.00
```

44. $\frac{27 \text{ minutes}}{90 \text{ ~~calories~~}} \times 200 \text{ ~~calories~~} = \frac{20 \times 27 \text{ minutes}}{9} = \frac{540 \text{ minutes}}{9} =$ **60 minutes**

45. $0.25 \times 200 =$ **50 mL**

```
  200
× 0.25
 1000
 400
50.00
```

46. $60 \times 0.45 =$ **27 mg**

```
  60
× 0.45
 300
 240
27.00
```

47. $\frac{6.75 \text{ mg}}{1 \text{ ~~minute~~}} \times 42 \text{ ~~minutes~~} = 6.75 \text{ mg} \times 42 =$ **283.5 mg of medication**

```
 6.75
×  42
1350
2700
283.50
```

48. $60 \text{ kg} \times 0.05 =$ **3 kg**

49. $0.17 \times \$12.56 = 2.14$

```
$12.56
-  2.14
$10.42
```


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50. 10% of 150 = 0.10 × 150 = 15

150 mg first dose
− 15
135 mg second dose
− 15
120 mg third dose
− 15
105 mg fourth dose
− 15
90 mg fifth dose
− 15
75 mg sixth dose

6 total doses

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