Brown and Mulholland's Drug Calculations 11th edition Brown Test Bank

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ESSAY

Directions: Solve the following problems.

1. Solve for *x*, and prove your answer: 2 : 5 = 10 : *x*

   ANS:
   x = *25*

   Know *Want to Know*
   2 : 5 = 10 : *x*

   $$\frac{2x}{2} = \frac{50}{2}$$

   $$x = 25$$

   Proof: 2 × 25 = 50
   5 × 10 = 50

2. Solve for *x*, and prove your answer: 3 : 10 = 6 : *x*

   ANS:
   x = 20

   Know *Want to Know*
   3 : 10 = 6 : *x*

   $$\frac{3x}{3} = \frac{60}{3}$$

   $$x = 25$$

   Proof: 3 × 20 = 60
   10 × 6 = 60

   Directions: Set up a ratio and proportion in each of the following problems. Label and prove your answers.

3. There are 20 patient beds contained in each hospital unit. How many units would there be for a hospital with a 300-bed capacity?

   ANS:
   15 units

   Know *Want to Know*
   20 beds : 1 unit = 300 beds : *x* units

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$$\frac{20x}{20} = \frac{300}{20}$$

$x = 15$ units

Proof: $20 \times 15 = 300$
$1 \times 300 = 300$

4. Each nurse is assigned five patients for a shift. How many nurses will be needed for 250 patients?

ANS:
50 nurses

Know *Want to Know*
1 nurse : 5 patients = x nurses : 250 patients

$$\frac{5x}{5} = \frac{250}{5}$$

$x = 50$ nurses

Proof: $1 \times 250 = 250$
$5 \times 50 = 250$

5. If a patient needs to have three pills 4 times a day, how many pills will be needed for a 1-week supply?

ANS:
84 pills

Know *Want to Know*
12 pills : 1 day = x pills : 7 days
$x = 1 \times 27$
$x = 84$ pills

Proof: $12 \times 7 = 84$
$1 \times 84 = 84$

6. A hospital hires one CNA for every 10 patients. How many CNAs will be needed for 200 patients?

ANS:
20 CNAs

Know *Want to Know*
1 CNA : 10 patients = x CNAs : 200 patients

$$\frac{1x}{10} = \frac{200}{10}$$

$x = 20$ CNAs

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Proof: $1 \times 200 = 200$
$10 \times 20 = 200$

7. A patient has a bottle of liquid medicine that contains 60 doses of medicine. How many days will the bottle last if the patient takes 4 doses a day?

ANS:
15 days

Know *Want to Know*
4 doses : 1 day = 60 doses : x days
$\frac{4x}{4} = \frac{60}{4}$
$x = 15$ days

Proof: $4 \times 15 = 60$
$1 \times 60 = 60$

8. A hospital averages 22 admissions per day. How many admissions does it average in a 30-day month?

ANS:
600 admissions

Know *Want to Know*
22 admissions : 1 day = x admissions : 30 days
$x = 22 \times 30$
$x = 600$ admissions

Proof: $22 \times 30 = 660$
$1 \times 660 = 660$

9. The x-ray department schedules a chest x-ray every 15 min. How many chest x-rays can be taken in 7 hr?

ANS:
28 x-rays

Know *Want to Know*
4 x-rays : 1 hr = x x-rays : 7 hr
$x = 4 \times 7$
$x = 28$ x-rays

Proof: $4 \times 7 = 28$
$1 \times 28 = 28$

10. There are 50 syringes in each package. The hospital uses 50 packages a week. How many syringes does the hospital use in a week?

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ANS:
2500 syringes

Know *Want to Know*
50 syringes : 1 package = x syringes : 50 packages
$x = 50 \times 50$
$x = 2500$ syringes

Proof : $50 \times 50 = 2500$
$1 \times 2500 = 2500$

11. The emergency room budgets for 100 L of intravenous D5W per day. How many liters are needed for 4 weeks?

ANS:
2800 L

Know *Want to Know*
100 L : 1 day = x L : 28 days
$x = 100 \times 28$
$x = 2800$ L

Proof: $100 \times 28 = 2800$
$1 \times 2800 = 2800$

12. The hospital schedules 150 nurses per week to cover two 12-hr shifts. How many nurses are employed each shift?

ANS:
75 nurses

Know *Want to Know*
150 nurses : 2 shifts = x nurses : 1 shift
$\frac{2x}{2} = \frac{150}{2}$
$x = 75$ nurses per shift

Proof: $150 \times 1 = 150$
$2 \times 75 = 150$

13. The hospital offers up to $3000 in tuition reimbursement. If each course costs $500, how many courses can you take?

ANS:
6 courses

Know *Want to Know*
$500 : 1 course = $3000 : x courses

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$\frac{500x}{500} = \frac{3000}{500}$
$x = 6$ courses

Proof: $500 \times 6 = 3000$
$1 \times 3000 = 3000$

14. There are 3 unit coordinators for each unit. How many unit coordinators will be employed for 12 units?

ANS:
36 coordinators

Know *Want to Know*
3 coordinators : 1 unit = x coordinators : 12 units
$x = 3 \times 12$
$x = 36$ coordinators

Proof: $3 \times 12 = 36$
$1 \times 36 = 36$

15. If you are paid $25 per hr for overtime, how many hr do you need to work to receive $600 in overtime earnings?

ANS:
24 hr

Know *Want to Know*
$25 : 1 hr = $600 : x hr
$\frac{25x}{25} = \frac{600}{25}$
$x = 24$ hr

Proof: $25 \times 24 = 600$
$1 \times 600 = 600$

16. The patient must drink 8 oz of water every hr. How many oz will be consumed in 12 hr?

ANS:
96 oz

Know *Want to Know*
8 oz : 1 hr = x oz : 12 hr
$x = 8 \times 12$
$x = 96$ oz

Proof: $8 \times 12 = 96$
$1 \times 96 = 96$

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17. You have to mix formula at 2 Tbsp per 8-oz bottle. How many Tbsp will you need to use for 6 bottles?

ANS:
12 Tbsp

Know *Want to Know*
2 Tbsp : 1 bottle = x Tbsp : 6 bottles
$x = 2 \times 6$
$x = 12$ Tbsp

Proof: $2 \times 6 = 12$
$1 \times 12 = 1$

18. The top sheets from the laundry are 12 to a package. How many packages will you need to cover 60 beds?

ANS:
5 packages

Know *Want to Know*
12 beds : 1 package = 60 beds : x packages

$$\frac{12x}{12} = \frac{60}{12}$$

$x = 5$ packages

Proof: $12 \times 5 = 60$
$1 \times 60 = 60$

19. The patient has a bottle of 100 cap. How many days will the bottle last if the patient takes 4 cap per day?

ANS:
25 days

Know *Want to Know*
4 cap : 1 day = 100 cap : x days

$$\frac{4x}{4} = \frac{100}{4}$$

$x = 25$ days

Proof: $4 \times 25 = 100$
$1 \times 100 = 100$

20. Your patient is being discharged and has to take 2 pills 3 times a day. How many pills will be needed for a 14-day supply?

ANS:

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84 pills

Know *Want to Know*
6 pills : 1 day = x pills : 14 days
$x = 6 \times 14$
$x = 84$ pills

Proof: $6 \times 14 = 84$
$1 \times 84 = 84$

21. How many syringes are there in a package of 10 dozen? Conversion factor: 1 dozen = 12 syringes.

ANS:
120 syringes

Know *Want to Know*
12 syringes : 1 dozen = x syringes : 10 dozen
$x = 12 \times 10$
$x = 120$ syringes

Proof: $12 \times 10 = 120$
$1 \times 120 = 120$

22. How many hr are there in 10 days? Conversion factor: 24 hr = 1 day.

ANS:
240 hr

Know *Want to Know*
24 hr : 1 day = x hr : 10 days
$x = 24 \times 10$
$x = 240$ hr

Proof: $24 \times 10 = 240$
$1 \times 240 = 240$

23. How many min are in 4.5 hr? Conversion factor: 1 hr = 60 min.

ANS:
270 min

Know *Want to Know*
1 hr : 60 min = 4.5 hr : x min
$x = 60 \times 4.5$
$x = 270$ min

Proof: $1 \times 270 = 270$
$60 \times 4.5 = 270$

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24. A bottle of 40 tablets costs the pharmacy $100. How much does each tablet cost?

ANS:
$2.50 per tablet

Know *Want to Know*
40 tablets : 100 dollars = 1 tablet : x dollars

$$\frac{40x}{40} = \frac{100}{40}$$

x = $2.50 per tablet

Proof: 40 × 2.50 = 100
100 × 1 = 100

25. The hospital assigns 4 interns to every resident. There are 7 residents. How many interns will the hospital need?

ANS:
28 interns

Know *Want to Know*
4 interns : 1 resident = x interns : 7 residents
$x = 4 \times 7$
x = 28 interns

Proof: 4 × 7 = 28
1 × 28 = 28

26. The container holds 1.5 quarts. How many oz does it hold? Conversion factor: 32 oz = 1 quart.

ANS:
48 oz

Know *Want to Know*
32 oz : 1 quart = x oz : 1.5 quarts
$x = 32 \times 1.5$
x = 48 oz

Proof: 32 × 1.5 = 48
1 × 48 = 48

27. The accounting office prints 400 pages per day. How many reams of paper should be bought to last 30 days? Conversion factor: 500 pages = 1 ream.

ANS:
24 reams

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Step 1:
Know *Want to Know*
400 pages : 1 day = x pages : 30 days
$x = 400 \times 30$
x = 12,000 pages in 30 days

Proof: 400×30
$1 \times 12{,}000 = 12{,}000$
Step 2:
Know *Want to Know*
500 pages : 1 ream = 12,000 pages : x reams
$\frac{500x}{500} = \frac{12{,}000}{500}$
x = 24 reams

Proof: $500 \times 24 = 12{,}000$
$1 \times 12{,}000 = 12{,}000$

28. The patient takes 5 medications 4 times a day. How many medications does the patient take in 1 week? Conversion factor: 7 days = 1 week.

ANS:
140 medications per week

Know *Want to Know*
20 medications : 1 day = x medications : 7 days
$x = 20 \times 7$
x = 140 medications per week

Proof: $20 \times 7 = 140$
$1 \times 140 = 140$

29. There are 10 RNs on each unit per 24-hr shift. How many RN salaries are needed for a week on a unit? Conversion factor: 7 days = 1 week.

ANS:
70 RN salaries

Know *Want to Know*
10 RNs : 1 day = x RNs : 7 days
$x = 10 \times 7$
x = 70 RN salaries

Proof: $10 \times 7 = 70$
$1 \times 70 = 70$

30. The computer has 4 gigabytes (GB) of memory. How many megabytes (MB) of memory does this equal? Conversion factor: 1024 MB = 1 GB.

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ANS:
4096 MB

Know *Want to Know*
1024 MB : 1 GM = x MB : 4 GB
$x = 1024 \times 4$
$x = 4096$ MB

Proof: $1024 \times 4 = 4096$
$1 \times 4096 = 4096$

31. The cardiac rehabilitation track is $\frac{1}{4}$ mile. The patient is now completing 12 laps on the track every morning. How many miles is the patient completing? Conversion factor: 4 laps (each lap is $\frac{1}{4}$ mile) = 1 mile. (Create a one-step ratio and proportion.)

ANS:
3 miles

Know *Want to Know*
4 laps : 1 mile = 12 laps : x miles
$\frac{4x}{4} = \frac{12}{4}$
$x = 3$ miles

Proof: $4 \times 3 = 12$
$1 \times 12 = 12$

32. The surgeon makes an incision that is $7\frac{1}{2}$ cm long. What is the equivalent in inches? Conversion factor: 2.5 cm = approximately 1 inch.

ANS:
3 inches

Know *Want to Know*
2.5 cm : 1 inch = 7.5 cm : x inch
$\frac{2.5x}{2.5} = \frac{7.5}{2.5}$
$x = 3$ inches

Proof: $2.5 \times 3 = 7.5$
$1 \times 7.5 = 7.5$

33. The field is 300 yards long. How many meters is it? Conversion factor: 1 yard = approximately 0.9 m.

ANS:

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270 m

Know *Want to Know*
1 yard : 0.9 m = 300 yards : x m
$x = 0.9 \times 300$
$x = 270$ m

Proof: $1 \times 270 = 270$
$0.9 \times 300 = 270$

34. The medication prescription is for 60 tablets. If the patient takes 4 tablets a day, how many days will the prescription last?

ANS:
15 days

Know *Want to Know*
4 tablets : 1 day = 60 tablets : x days
$\frac{4x}{4} = \frac{60}{4}$
$x = 15$ days

Proof: $4 \times 15 = 60$
$1 \times 60 = 60$

35. The patient needs to drink 8 oz of water every hr while awake (16 hr). How many mL of water will the patient drink? Conversion factor: 8 oz = 24 mL.

ANS:
3840 mL

Know *Want to Know*
240 mL : 1 hr = x mL : 16 hr
$x = 240 \times 16$
$x = 3840$ mL

Proof: $240 \times 16 = 3840$
$1 \times 3840 = 3840$

36. The patient is supposed to drink 8 oz of fluid every waking hr. How many quarts should be consumed in 12 hr? Conversion factor: 16 oz = 1 pint, 2 pints = 1 quart. (Create a two-step ratio and proportion.)

ANS:
3 quarts

Step 1:
Know *Want to Know*
32 oz : 1 quart = 8 oz : x quarts

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$$\frac{32x}{32} = \frac{8}{32}$$
$$4$$

x = 0.25 quarts

Proof: 32 × 0.25 = 8
1 × 8 = 8

Step 2:
Know *Want to Know*
0.25 quarts : 1 hr = x quarts : 12hr
x = 0.25 × 12
x =3 quarts

Proof: 0.25 × 12 =3
1 × 3 = 3

37. The patient takes 7 oral medications per day. How many medications does the patient take in 2 weeks? Conversion factor: 7 days = 1 week.

ANS:
98 medications

Know *Want to Know*
7 medications : 1 day = x medications : 14 days
x = 14 × 7
x = 98 medications

Proof: 7 × 14 = 98
1 × 98 = 98

38. A newborn weighs 3500 g. How many kg does the infant weigh? Conversion factor: 1 kg = 1000 g.

ANS:
3.5 kg

Know *Want to Know*
1 kg : 1000 g = x kg : 3500 g
$$\frac{1000x}{1000} = \frac{3500}{1000}$$
x = 3.5 kg

Proof: 1 × 3500 = 3000
3.5 × 1000 = 3500

39. How many km are in 75 miles? Conversion factor: 0.6 miles = 1 km.

ANS:

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125 km

Know *Want to Know*
0.6 miles : 1 km = 75 miles : x km

$$x = \frac{0.6x}{0.6} = \frac{75}{0.6}$$

$x = 125$ km

Proof: $0.6 \times 125 = 75$
$1 \times 75 = 75$

40. A child weighs 66 lb. How many kg does the child weigh? Conversion factor: 1 kg = 2.2 lb.

ANS:
30 kg

Know *Want to Know*
1 kg : 2.2 lb = x kg : 66 lb

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

$x = 30$ kg

Proof: $1 \times 66 = 66$
$2.2 \times 30 = 66$

Directions: Fill in the quantity for x in the following ratio and proportion table.

41. $1 : 2 = 4 : x$

ANS:
8

42. $2 : 6 = 3 : x$

ANS:
9

43. $5 : 10 = 10 : x$

ANS:
20

44. $12 : 4 = 15 : x$

ANS:
5

45. $x : 5 = 5 : 25$

ANS:

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1

46. 50 : 10 = 100 : x

ANS:
20

47. 10 : 60 = 5 : x

ANS:
30

48. 4 : 1 = x : 2

ANS:
8

49. 25 : 75 = x : 30

ANS:
10

50. 250 : x = 2 : 1

ANS:
125

51. If you exercise 3 miles per day 5 days per week on a treadmill, how many miles do you exercise in 20 days?

ANS:
60 miles

Know *Want to Know*
15 miles : 5 days = x miles : 20 days
$\frac{5x}{5} = \frac{300}{5}$
x = 60 miles in 20 days

Proof: 15 × 20 = 300
5 × 60 = 300

52. The nurse receives 1.5 vacation/sick days per month after 5 years of service. How many vacation/sick days will the nurse receive per year?

ANS:
18 days

Know *Want to Know*
1.5 days : 1 month = x days : 12 months
x = 1.5 × 12

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x = 18 vacation/sick days per year

Proof: $1.5 \times 12 = 18$
$1 \times 18 = 18$

53. The physician's order states the patient must consume 1500 mL of water every 24 hr. If the patient is awake 12 hr per day, how many mL of water should the patient consume each waking hr?

ANS:
125 mL per hr

Know *Want to Know*
1500 mL : 12 hr = x mL : 1 hr
$\frac{12x}{12} = \frac{1500}{12}$
x = 125 mL per hr

Proof: $1500 \times 1 = 1500$
$12 \times 125 = 1500$

54. The ambulance averages 15 miles per gallon. If gasoline costs 3 dollars per gallon, then what is the cost for driving 450 miles per week? (Is this a one-step or two-step ratio and proportion?)

ANS:
90 dollars per week

Two-step ratio and proportion

Step 1:
Know *Want to Know*
15 miles : 1 gallon = 450 miles : x gallons
$\frac{15x}{15} = \frac{450}{15}$
x = 30 gallons per week

Step 2:
Know *Want to Know*
\$3:1 gallon = \$$x$: 30 gallons
x = \$90 per week

55. The patient is taking medicine to increase urinary output. The physician requested to be notified if the patient's urinary output fell below 1500 mL per 24 hr. The patient averages an output of 50 mL per hr. Should the physician be notified?

ANS:

Know *Want to Know*
50 mL : 1 hr = x mL : 24 hr

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x = 1200 mL per 24 hr

Yes. The physician should be notified.

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