

Chapter 02: Ratio and Proportion

Tritak: Brown and Mulholland's Drug Calculations: Ratio and Proportion Problems for Clinical Practice, 11th Edition

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*

$$2 : 5 = 10 : x$$

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

$$x = 25$$

$$\text{Proof: } 2 \times 25 = 50$$

$$5 \times 10 = 50$$

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

ANS:

$$x = 20$$

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Know *Want to Know*

$$3 : 10 = 6 : x$$

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

$$x = 20$$

$$\text{Proof: } 3 \times 20 = 60$$

$$10 \times 6 = 60$$

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*

$$20 \text{ beds} : 1 \text{ unit} = 300 \text{ beds} : x \text{ units}$$



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

$$x = 15 \text{ units}$$

$$\text{Proof: } 20 \times 15 = 300$$

$$1 \times 300 = 300$$

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

$$\frac{1x}{5} = \frac{250}{5}$$

$$x = 50 \text{ nurses}$$

$$\text{Proof: } 1 \times 250 = 250$$

$$5 \times 50 = 250$$

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:

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84 pills

Know

Want to Know

12 pills : 1 day = x pills : 7 days

$$x = 1 \times 27$$

$$x = 84 \text{ pills}$$

$$\text{Proof: } 12 \times 7 = 84$$

$$1 \times 84 = 84$$

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

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

$$x = 20 \text{ CNAs}$$



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

$$\frac{4x}{4} = \frac{60}{4}$$

$$x = 15 \text{ days}$$

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

$$x = 22 \times 30$$

$$x = 600 \text{ admissions}$$

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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

$$x = 4 \times 7$$

$$x = 28 \text{ x-rays}$$

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?



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? GRADESMORE.COM

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



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

$$x = 6 \text{ courses}$$

$$\text{Proof: } 500 \times 6 = 3000$$

$$1 \times 3000 = 3000$$

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

$$x = 3 \times 12$$

$$x = 36 \text{ coordinators}$$

$$\text{Proof: } 3 \times 12 = 36$$

$$1 \times 36 = 36$$

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

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Know

Want to Know

\$25 : 1 hr = \$600 : x hr

$$\frac{25x}{25} = \frac{600}{25}$$

$$x = 24 \text{ hr}$$

$$\text{Proof: } 25 \times 24 = 600$$

$$1 \times 600 = 600$$

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

$$x = 8 \times 12$$

$$x = 96 \text{ oz}$$

$$\text{Proof: } 8 \times 12 = 96$$

$$1 \times 96 = 96$$



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

$$x = 2 \times 6$$

$$x = 12 \text{ Tbsp}$$

Proof: $2 \times 6 = 12$

$$1 \times 12 = 12$$

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

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

$$x = 5 \text{ packages}$$

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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

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

$$x = 25 \text{ days}$$

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:



84 pills

Know *Want to Know*

6 pills : 1 day = x pills : 14 days

$$x = 6 \times 14$$

$$x = 84 \text{ pills}$$

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

$$x = 12 \times 10$$

$$x = 120 \text{ syringes}$$

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:

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240 hr

Know *Want to Know*

24 hr : 1 day = x hr : 10 days

$$x = 24 \times 10$$

$$x = 240 \text{ hr}$$

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

$$x = 60 \times 4.5$$

$$x = 270 \text{ min}$$

Proof: $1 \times 270 = 270$

$$60 \times 4.5 = 270$$