

Chapter 2 Part B Test

Form K

Lessons 2-6 through 2-10

Do You Know HOW?

Convert the given amount to the given unit.

1. 8 ft; in. $8 \text{ ft. } \frac{12 \text{ in}}{1 \text{ ft}}$
 96 in.

2. 2.5 miles; ft
 $2.5 \text{ mi. } \frac{5280 \text{ ft.}}{1 \text{ mi.}}$
 $13,200 \text{ ft.}$

3. 260 sec; min
 $260 \text{ sec. } \frac{1 \text{ min}}{60 \text{ sec}}$
 $4.\bar{3}$ or $4\frac{1}{3} \text{ min.}$

Solve each proportion. Use the Multiplication Property of Equality or the Cross Product Property. Explain your choice.

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

5. $\frac{x+1}{15} = \frac{-4}{5}$
 $5(x+1) = -4(15)$
 $5x+5 = -60$
 $\frac{5x+5}{-5} = \frac{-60}{-5}$
 $x+1 = 12$
 $x = 11$

6. $\frac{2}{q} = \frac{8}{q+12}$
 $2(q+12) = 8q$
 $2q+24 = 8q$
 $-2q \quad -2q$
 $24 = 6q$
 $\frac{24}{6} = \frac{6q}{6}$
 $4 = q$

Solve each proportion.

7. $\frac{2.5}{10} = \frac{m}{4}$
 $10m = 2.5(4)$
 $10m = 10$
 $\frac{10m}{10} = \frac{10}{10}$
 $m = 1$

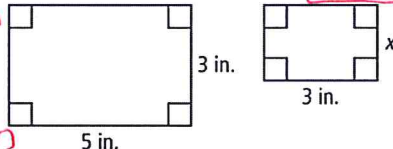
8. $\frac{14}{49} = \frac{4}{x}$
 $14x = 4(49)$
 $14x = 196$
 $\frac{14x}{14} = \frac{196}{14}$
 $x = 14$

9. $\frac{k}{10} = \frac{9}{6}$
 $6k = 90$
 $\frac{6k}{6} = \frac{90}{6}$
 $k = 15$

10. The figures at the right are similar. Find the missing length.

$\frac{P}{100} = \frac{\text{is}}{\text{of}}$

$\frac{5}{3} = \frac{3}{x}$
 $5x = 9$
 $x = \frac{9}{5}$ or 1.8 in.



11. What percent of 50 is 30?

$\frac{30}{50} \cdot \frac{P}{100} = \frac{30}{50}$
 $50P = 3000$
 $\frac{50P}{50} = \frac{3000}{50}$
 $P = 60$
 60%

OR
 $\frac{P \cdot 50}{50} = \frac{30}{50}$
 $P = .6 \rightarrow 60\%$

12. What is 45% of 120?

$\frac{45}{100} = \frac{x}{120}$
 $100x = 45 \cdot 120$
 $\frac{100x}{100} = \frac{5400}{100}$
 $x = 54$

OR
 $x = .45(120)$
 $x = 54$

$\frac{\text{difference}}{\text{original}}$

Tell whether each percent change is an increase or decrease. Then find the percent change.

13. Original amount: \$46
 New amount: \$52
 $\frac{52-46}{46} = \frac{6}{46} = 0.130435$
 13.0%
 increase

14. Original amount: \$25
 New amount: \$35
 $\frac{35-25}{25} = \frac{10}{25} = .4$
 40%
 increase

15. Original amount: \$99.50
 New amount: \$92.50
 $\frac{99.5-92.50}{99.50} = 0.07035176$
 7.0%
 decrease

16. Original amount: \$19.25
 New amount: \$22.75
 $\frac{22.75-19.25}{19.25} = 0.153846$
 15.4%
 increase

Chapter 2 Part B Test (continued)

Form K

Lessons 2-6 through 2-10

Define a variable and write an equation for each situation. Then solve.

17. There are 21 females in the Algebra 1 class. If 75% of the class is female, how many students are there in the class?

$$\frac{21}{x} = \frac{75}{100} \quad \frac{75x}{75} = \frac{2100}{75}$$

$$x = \boxed{28 \text{ students}}$$

18. The scale of a map is 1 in. : 75 km. Determine the distance between two towns that are 5.6 in. apart on the map.

$$\frac{1 \text{ in}}{75 \text{ km}} = \frac{5.6 \text{ in}}{x} \rightarrow x = 5.6(75)$$

$$x = \boxed{420 \text{ km}}$$

19. A flagpole casts a 32-ft shadow. A boy who is 6 feet tall is standing near the flagpole casting a 16-ft shadow. They form similar triangles. How tall is the flagpole?

$$\frac{\text{height}}{\text{shadow}} = \frac{x}{16} = \frac{6}{32} \quad \frac{32x}{32} = \frac{32 \cdot 6}{32}$$

$$x = \boxed{12 \text{ ft}}$$

20. In 2005, a car sold new for \$12,500. In 2008, value of the car was \$8750. Find the percent decrease.

$$\frac{\text{difference}}{\text{original}} = \frac{12,500 - 8750}{12,500} = \frac{3750}{12,500} = 0.3 \rightarrow 30\%$$

Do You UNDERSTAND?

21. **Error Analysis** The average class grade went from 86% to an 81%. Susie thinks this represents a 5% change in the average. Explain Susie's error. What is the actual percent decrease?

Susie found the difference, not the percent.

$$\frac{\text{difference}}{\text{original}} = \frac{86 - 81}{86} = \frac{5}{86} = 0.05813953 \rightarrow 5.8\%$$

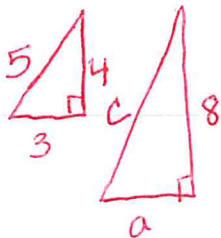
22. **Open-Ended** Write a problem that can be solved using proportions. Write the proportion and solve the problem.

Tom is 5 ft and his shadow is 12 ft. His sister's shadow is 6 ft. How tall is Tom's sister?

$$\frac{5}{12} = \frac{x}{6} \quad 12x = 30$$

$$x = \frac{30}{12} = \frac{6 \cdot 5}{6 \cdot 2} = \frac{5}{2} = 2\frac{1}{2} \text{ ft}$$

23. **Writing** Suppose you are given two similar triangles. All three side lengths of one triangle are given and one side length of the other triangle is given. Explain how you can find one of the missing side lengths. Include the steps for solving for the missing length.



Use a missing side and the given side for each ratio. Write proportion using same sides of other triangle

$$\frac{a}{8} = \frac{3}{4} \rightarrow 4a = 24$$

$$a = 6$$

$$\frac{c}{8} = \frac{5}{10} \rightarrow 4c = 40$$

$$c = 10$$