

Pre-Test

Name _____ Date _____

7

Use the scenario below to answer Questions 1 through 3.

The cost of 15 gallons of gas is \$45.

1. Find the number of gallons of gas you could buy with \$9. Show all your work.

The cost of gas is $\frac{\$45}{15 \text{ gallons}}$, or \$3 per gallon.

You can buy 3 gallons of gas for \$9.

2. Write a proportion to support your answer in Question 1.

$$\frac{45}{15} = \frac{9}{G}$$

3. Find the cost of 10 gallons of gas. Use your proportion to answer the question. Show all your work.

$$\frac{45}{15} = \frac{C}{10}$$

$$15C = 450$$

$$C = 30$$

So, the cost of 10 gallons of gas is \$30.

4. Four lemons cost 96¢. Find the cost of 3 lemons. Circle the correct answer. Show all your work.

a. \$0.24 b. \$0.32 **c.** \$0.72 d. \$2.88

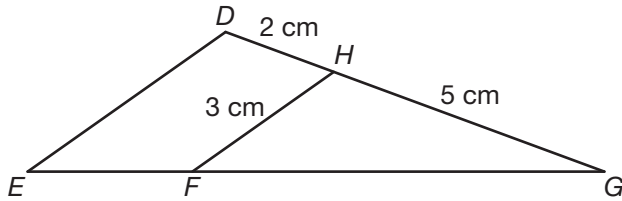
$$\frac{4}{96} = \frac{3}{C}$$

$$4C = 288$$

$$C = 72$$

So, the cost of 3 lemons is 72¢.

5. In the figure shown below, $\overline{DE} \parallel \overline{HF}$. Find the length of \overline{DE} . Show all your work.



Let x be the length of \overline{DE} .

$$\frac{5}{7} = \frac{3}{x}$$

$$5x = 21$$

$$x = 4.2$$

So, the length of \overline{DE} is 4.2 centimeters.

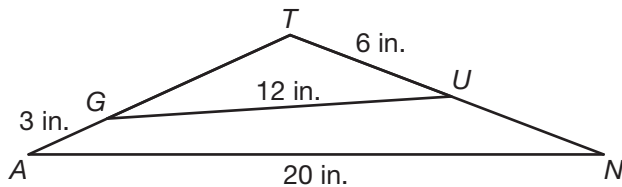
6. Use the given information on the diagrams below to determine whether these triangles are similar. Explain your reasoning.



$$\frac{6}{3} = 2, \frac{24}{12} = 2, \frac{28}{14} = 2$$

The ratio of each pair of corresponding sides is 2 so the triangles are similar.

7. In the figure shown below, $\triangle TUG \sim \triangle TAN$, $TU = 6$ inches, $GA = 3$ inches, $GU = 12$ inches, and $AN = 20$ inches. Find the length of \overline{TG} .



$$\frac{TU}{TA} = \frac{UG}{AN} \text{ and } TA = TG + GA, \text{ so } \frac{TU}{TG + GA} = \frac{UG}{AN}$$

$$\frac{6}{TG + 3} = \frac{12}{20}$$

$$12TG + 36 = 120$$

$$12TG = 84$$

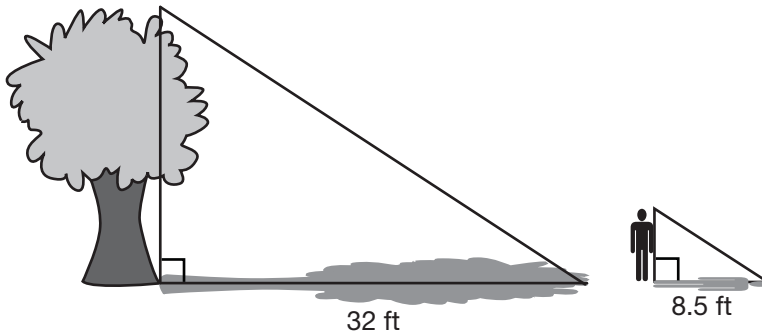
$$TG = 7$$

So, the length of \overline{TG} is 7 inches.

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Read the scenario below. Use the scenario to answer Questions 8 through 10.

The homeowner’s association at the Sunshine City housing complex informs Eric that the tree in his front yard is too tall and needs to be cut down. Zoning laws state that trees cannot exceed 20 feet in height. To measure the height of the tree, Eric stands near the tree. He measures the shadow of the tree on the ground and then measures his own shadow. Eric’s shadow is $8\frac{1}{2}$ feet. The tree’s shadow is 32 feet. Eric is $5\frac{1}{2}$ feet tall.



8. Use complete sentences to explain why these two triangles are similar.

Sample Answer: The triangles are similar because the shadows on the ground are perpendicular to their objects, forming right triangles and the corresponding angles are congruent due to the angle of the sun casting the shadows on both objects at the same time.

9. Find the height of the tree. Show all your work.

$$\frac{32}{8.5} = \frac{x}{5.5}$$

$$8.5x = 176$$

$$x \approx 20.71$$

So, the length of the tree is about 20.71 feet.

10. Does Eric need to cut the tree down? Use a complete sentence in your answer.

The height of the tree is about 20.71 feet, which is greater than 20 feet. So, Eric does need to cut the tree down.