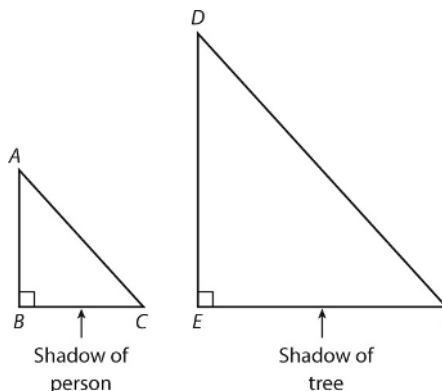


**LESSON** **12-3** **Using Proportional Relationships**

**Practice and Problem Solving: A/B**

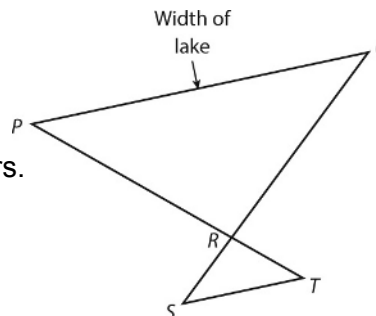
Refer to the figure for Problems 1–3. The figure shows triangles  $ABC$  and  $DEF$  formed by a person and a tree with their shadows. The figure is not drawn to scale.



1. Jim, shown by  $\overline{AB}$ , is 5 feet, 8 inches tall. He casts a shadow that is 6 feet, 4 inches long. A tree, shown by  $\overline{DE}$ , casts a shadow that is 19 feet long. How tall is the tree? \_\_\_\_\_
2. Alicia is 5 feet, 4 inches tall. She casts a shadow that is 6 feet long. The tree casts a shadow that is 18 feet long. How tall is the tree?  
\_\_\_\_\_

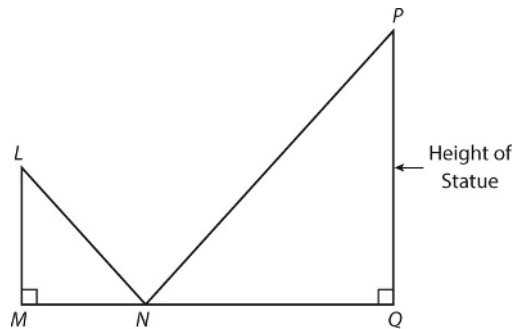
3. Explain why triangles  $ABC$  and  $DEF$  are similar.  
\_\_\_\_\_  
\_\_\_\_\_

Refer to the figure for Problems 4–6. In the figure,  $\overline{PQ}$  represents the width of a lake.  $\overline{PQ}$  and  $\overline{ST}$  are parallel. The figure is not drawn to scale.



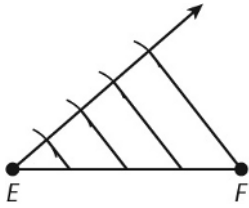
4. Suppose  $PR = 45$  meters,  $RT = 16$  meters, and  $ST = 24$  meters. What is the width of the lake? \_\_\_\_\_
5. Suppose  $QR = 52$  yards,  $RS = 15$  yards, and  $ST = 20$  yards. How wide is the lake? \_\_\_\_\_

Refer to the figure for Problems 6 and 7. A mirror is placed on the ground, shown by point  $N$ , so that a person looking at it can see the top of a nearby statue, shown by point  $P$ . The figure is not drawn to scale.

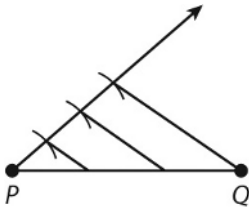


6. The mirror is placed 30 feet away from the statue, and Jean stands 5 feet from the mirror. If her eyes are 5 feet, 6 inches above the ground, shown by  $\overline{LM}$ , how tall is the statue? \_\_\_\_\_
7. The mirror is placed 5 meters away from the statue and Paul stands 1 meter from the mirror. If his eyes are 1.5 meters above the ground, how tall is the statue? \_\_\_\_\_

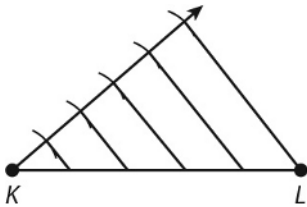
6.



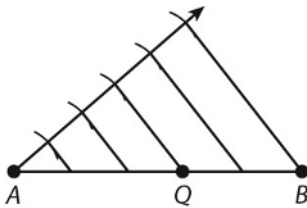
7.



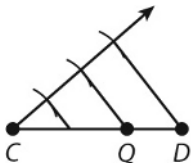
8.



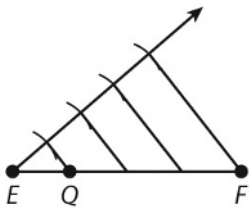
9.



10.



11.



**Reading Strategies**

1. Possible answer: The length of the segment is multiplied by the ratio of the lengths of the parts the segment is divided into.

2. Possible answer: To find the distance from  $A$  to  $B$  in a one-dimensional system, you find the absolute value of the difference of the single values associated to points  $A$  and  $B$ . You find the absolute value of the difference of the  $x$ - and  $y$ -coordinates.

**Success for English Learners**

1. Possible answer: Subtracting the coordinates finds the difference or distance between them.
2. Possible answer: The ratio describes the distance that  $P$  is from  $A$ . Adding that distance to the coordinates of  $A$  locates the coordinates of  $P$ .

**LESSON 12-3**

**Practice and Problem Solving: A/B**

1. 17 ft
2. 16 ft
3. The rays of the sun are parallel, so  $\overline{AC}$  and  $\overline{DF}$  are parallel. Thus,  $\angle C$  and  $\angle F$  are congruent.  $\angle B \cong \angle E$  because they are right angles. Thus, the triangles are similar by the AA Similarity Criterion.
4. 67.5 m
5. 69 yd, 1 ft
6. 33 ft
7. 7.5 m

**Practice and Problem Solving: C**

1. 18 ft,  $4\frac{1}{2}$  in.
2. approximately 5 ft, 9 in.
3. 42 m
4.  $\frac{5}{12}$
5. Because  $\overline{PR}$  and  $\overline{UV}$  are parallel,  $\angle WUV \cong \angle P$  and  $\angle WVU \cong \angle R$  since they are Corresponding Angles. Thus, the triangles are similar by the AA Similarity Criterion.
6.  $x = \frac{26}{7}$ ,  $y = \frac{42}{13}$