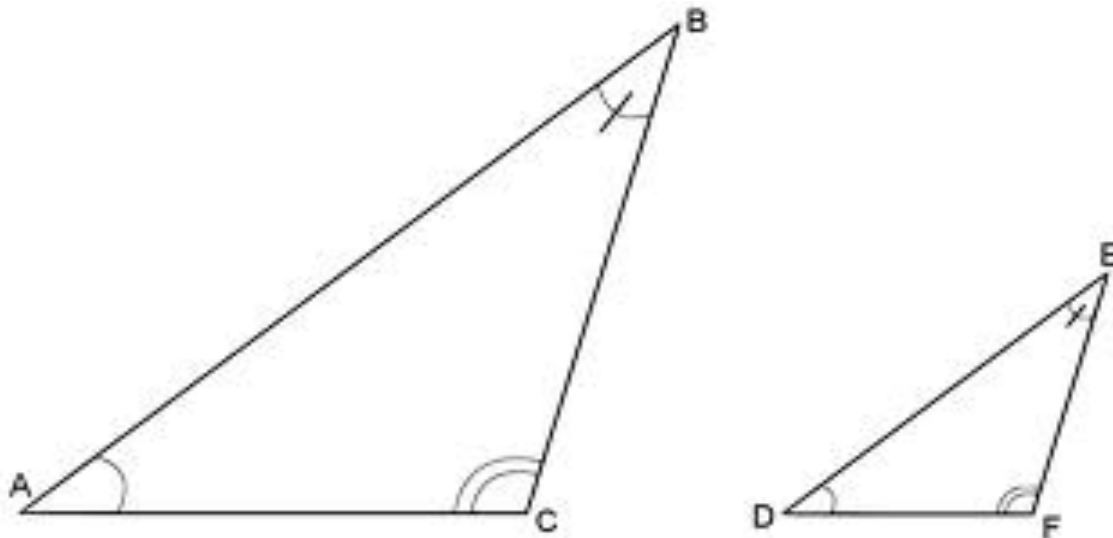


SIMILAR TRIANGLES AND INDIRECT MEASUREMENT

LESSON 5

OBJECTIVE:

Students will solve problems involving similar triangles.

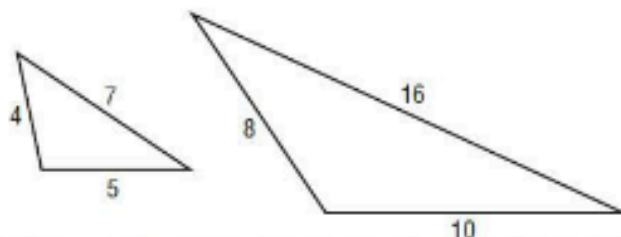




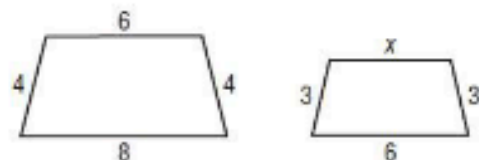
Common Core Quick Check


Use with Lesson 5
Standard 8.G.4

1. Determine whether the pair of polygons is similar. Explain.



2. The pair of polygons is similar. Find the missing side measure.



3.  **TEST PRACTICE** A greeting card is 8 inches by 6 inches, but it will have to be cut to fit in an envelope. The scale factor from the original card to the smaller card is $5:4$. Find the dimensions of the smaller card.

A. $3 \times 3\frac{3}{4}$

C. $6\frac{2}{3} \times 5\frac{1}{3}$

B. $10 \times 7\frac{1}{2}$

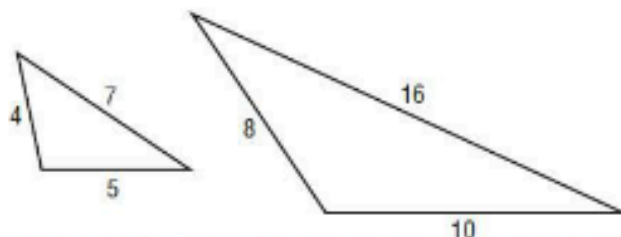
D. $6\frac{2}{5} \times 4\frac{4}{5}$



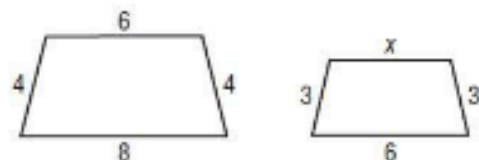
Common Core Quick Check

Use with Lesson 5
Standard 8.G.4

1. Determine whether the pair of polygons is similar. Explain.



2. The pair of polygons is similar. Find the missing side measure.



ANSWERS

1. No; corresponding sides are not proportional.

2. $\frac{3}{4} = \frac{x}{6}$; $x = 4.5$

3. D

3. **TEST PRACTICE** A greeting card is 6 inches by 6 inches, but it will have to be cut to fit in an envelope. The scale factor from the original card to the smaller card is 5:4. Find the dimensions of the smaller card.

A. $3 \times 3\frac{3}{4}$

C. $6\frac{2}{3} \times 5\frac{1}{3}$

B. $10 \times 7\frac{1}{2}$

D. $6\frac{2}{5} \times 4\frac{4}{5}$



Essential Question

HOW can you determine congruence and similarity?

Think – Pair – Share

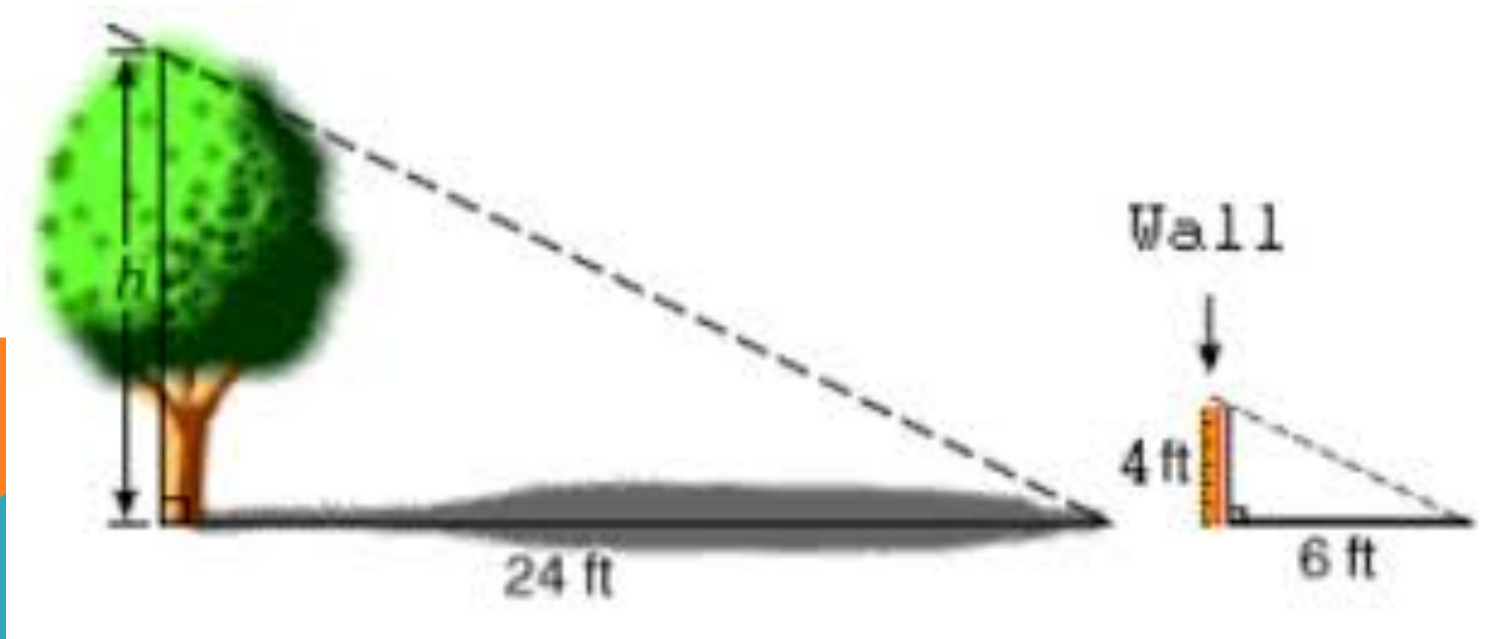
Take 2 minutes to think about this question. Write down a few thoughts about what you have learned so far in this chapter.

Now, turn to a partner and discuss what you have learned.

I will call on a few pairs to share their thoughts.

VOCABULARY

Indirect measurement allows you to use properties of similar polygons to find distances or lengths that are difficult to measure directly.

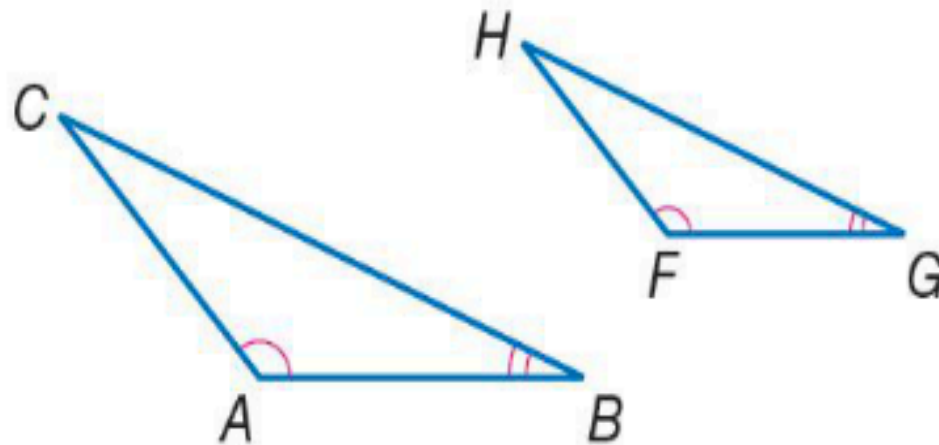


Key Concept **Angle-Angle (AA) Similarity**

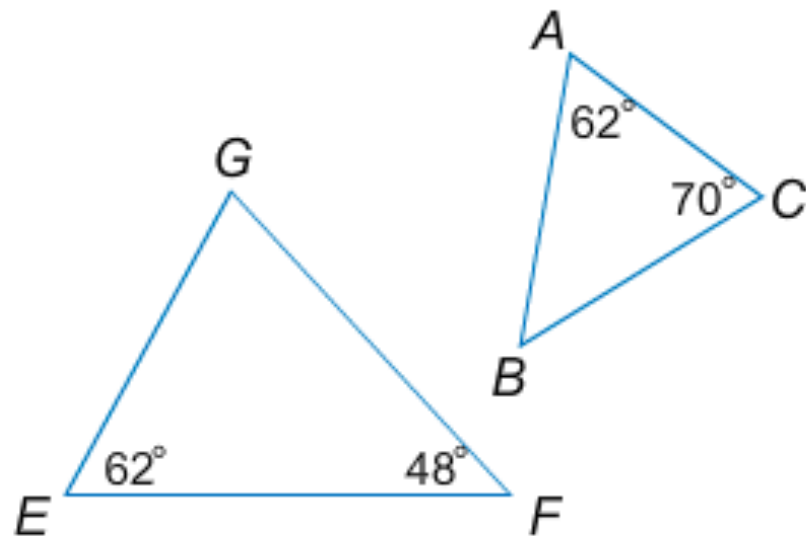
Words If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.

Symbols If $\angle A \cong \angle F$ and $\angle B \cong \angle G$, then $\triangle ABC \sim \triangle FGH$.

Model



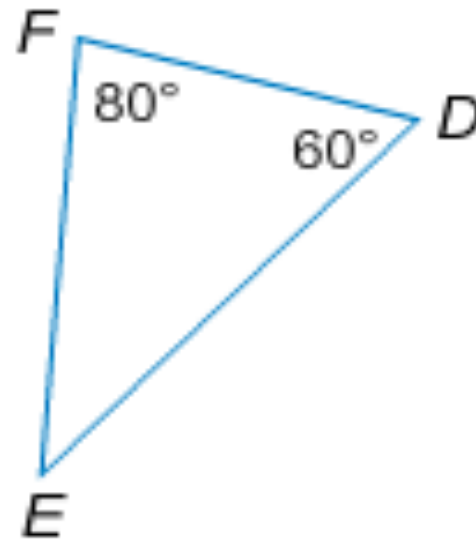
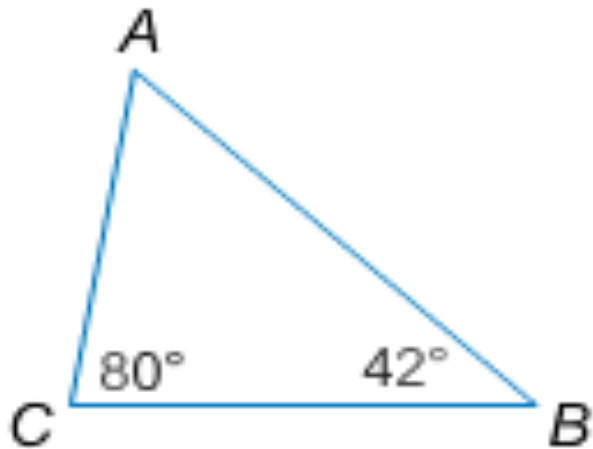
1. Determine whether the triangles are similar. If so, write a similarity statement.



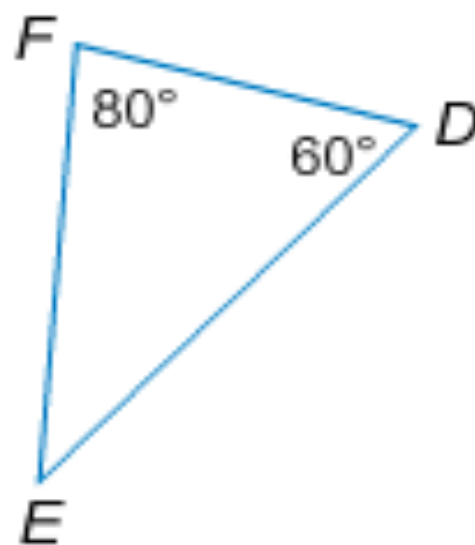
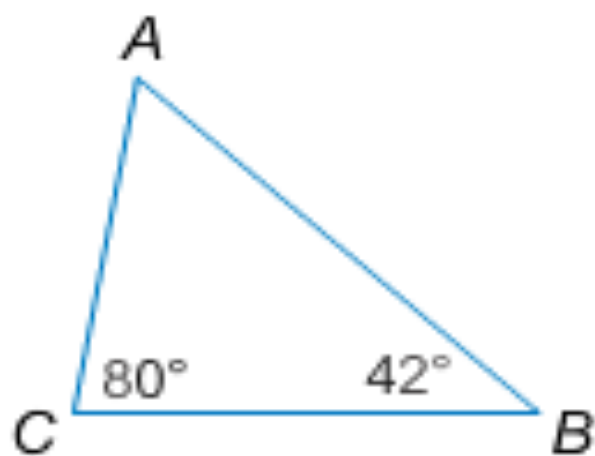
- 1 Angle A and $\angle E$ have the same measure, so they are congruent. Since $180 - 62 - 48 = 70$, $\angle G$ measures 70° . Two angles of $\triangle EFG$ are congruent to two angles of $\triangle ABC$, so $\triangle ABC \sim \triangle EFG$.

Now you try.

Determine whether the triangles are similar. If so, write a similarity statement.



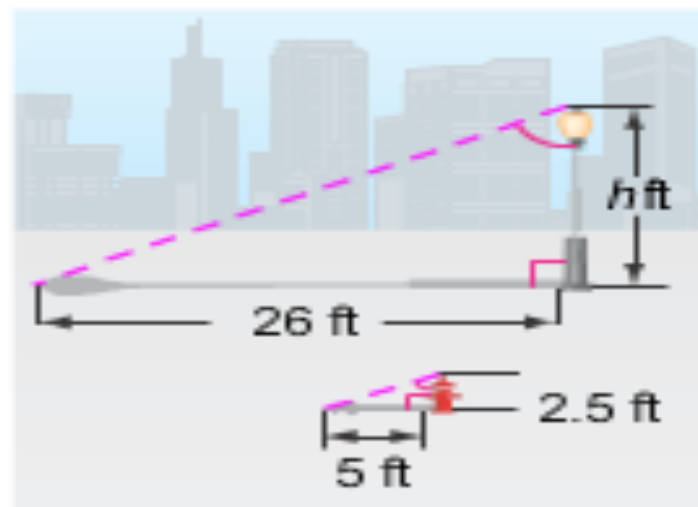
Determine whether the triangles are similar. If so, write a similarity statement.



Answer

The triangles are not similar.

2. A fire hydrant 2.5 feet high casts a 5-foot shadow. How tall is a street light that casts a 26-foot shadow at the same time? Let h represent the height of the street light.



1

Shadow

Height

2

$$\begin{array}{l} \text{hydrant} \rightarrow \\ \text{street light} \rightarrow \end{array} \frac{5}{26} = \frac{2.5}{h} \begin{array}{l} \leftarrow \text{hydrant} \\ \leftarrow \text{street light} \end{array}$$

3

$$5h = 26 \cdot 2.5$$

$$5h = 65$$

$$\frac{5h}{5} = \frac{65}{5}$$

$$h = 13$$

Find the cross products.

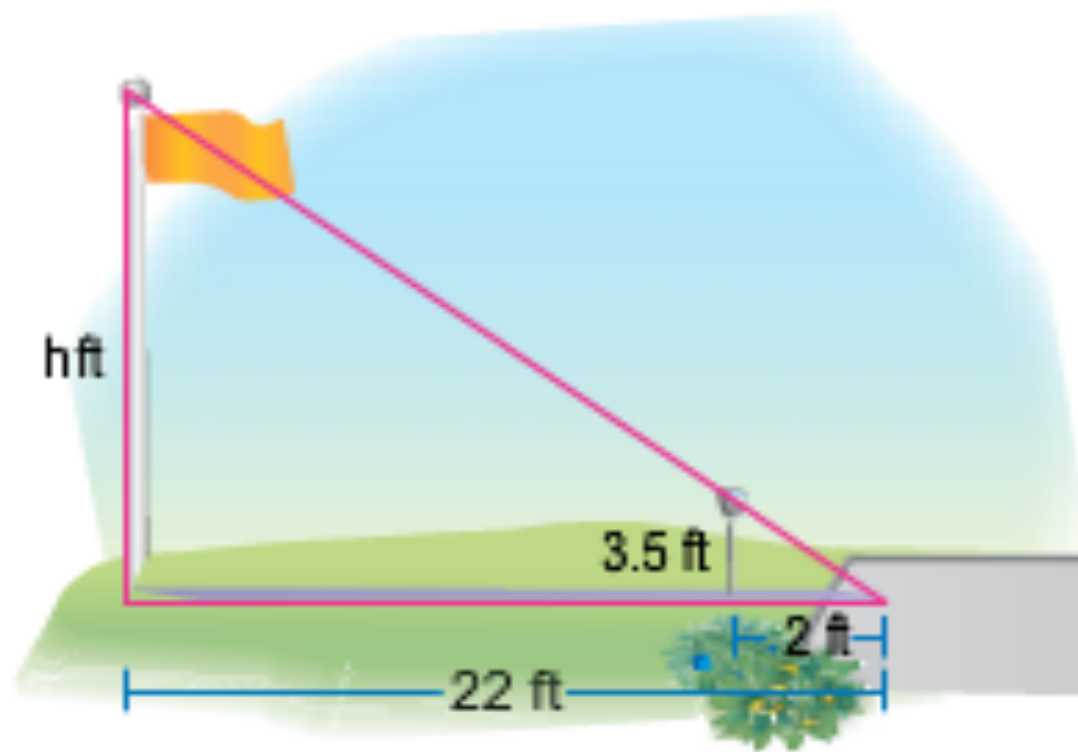
Multiply.

Divide each side by 5.

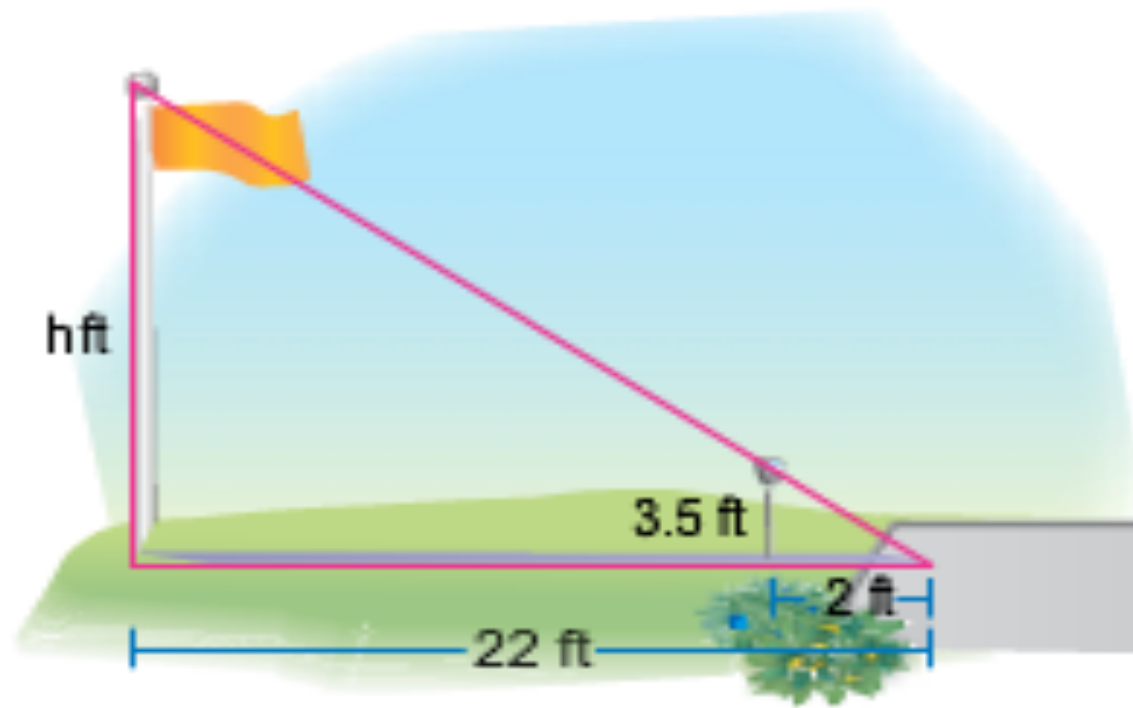
4

The street light is 13 feet tall.

How tall is the flagpole?



How tall is the flagpole?

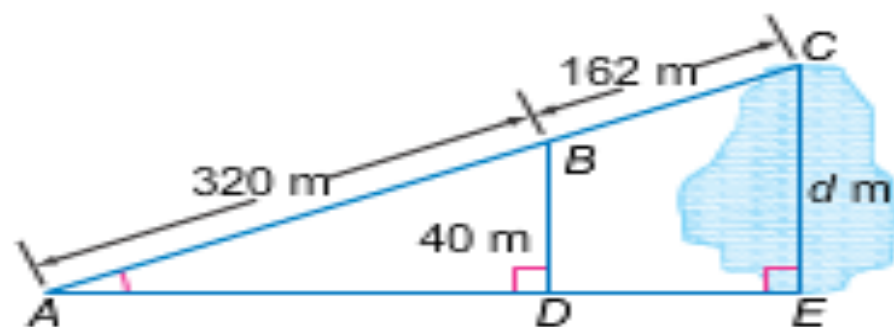


Answer

38.5 ft

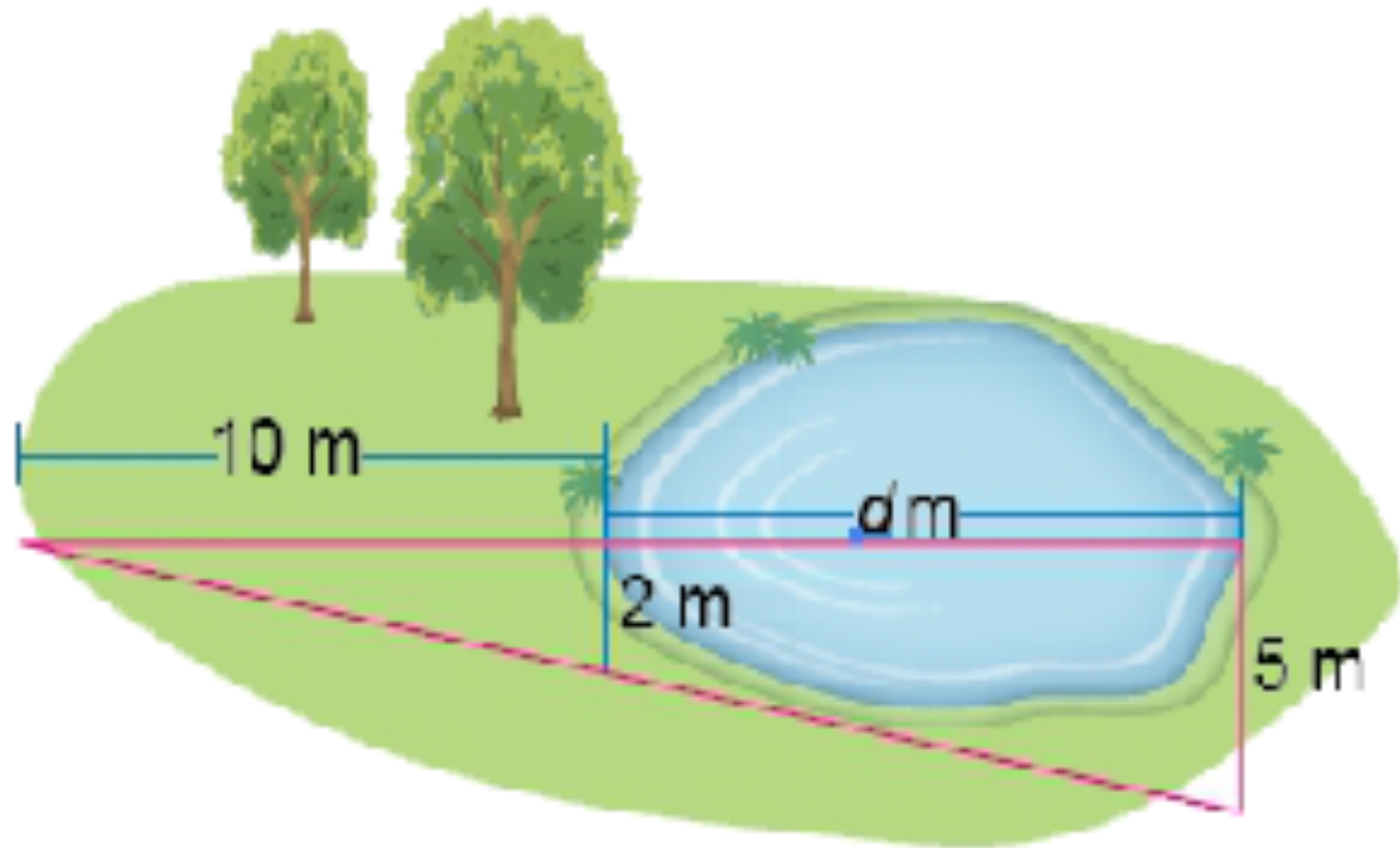
[Measuring a tree Video](#)

3. In the figure at the right, triangle DBA is similar to triangle ECA . Ramon wants to know the distance across the lake.

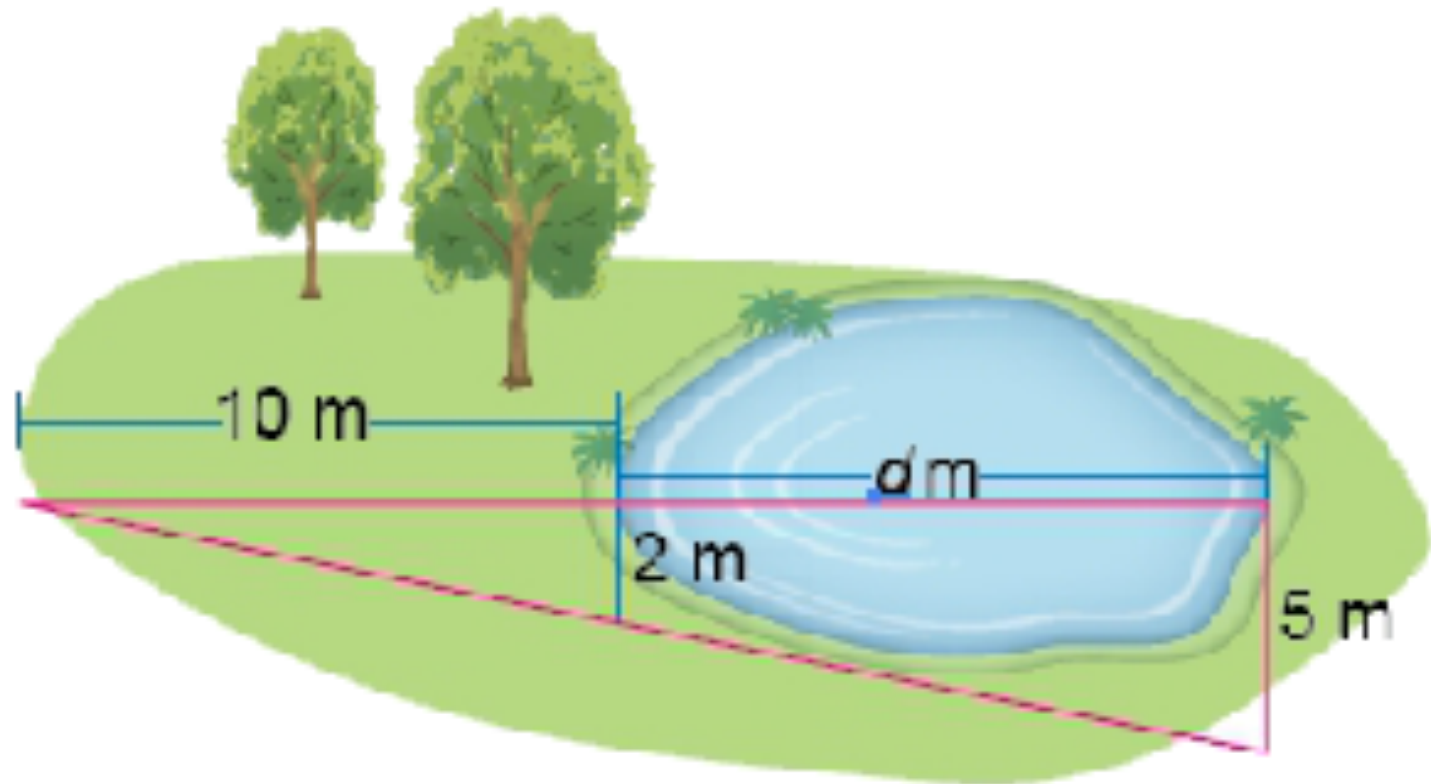


- $\frac{AB}{AC} = \frac{BD}{CE}$ \overline{AB} corresponds to \overline{AC} and \overline{BD} corresponds to \overline{CE} .
- $\frac{320}{482} = \frac{40}{d}$ Replace AB with 320 , AC with 482 , and BD with 40 .
- $320d = 482 \cdot 40$ Find the cross products.
- $\frac{320d}{320} = \frac{19,280}{320}$ Multiply. Then divide each side by 320 .
- $d = 60.25$
- The distance across the lake is 60.25 meters.

The two triangles in the figure are similar. Find the distance across the lake.



The two triangles in the figure are similar. Find the distance across the lake.



Answer

15 m

HOMEWORK

Pg. 557-560

**Problems: 1-12 all and
13-23 odds**

