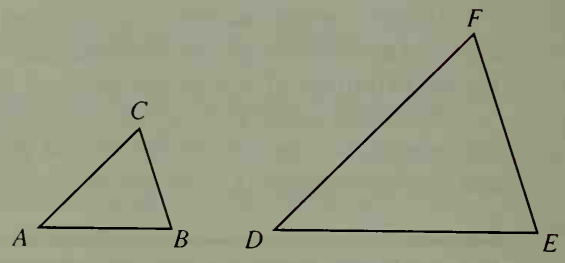
The example shows one way to prove that the product of the lengths of two segments is equal to the product of the lengths of two other segments. You prove that two triangles are similar, write a proportion, and then apply the means-extremes property of proportions.

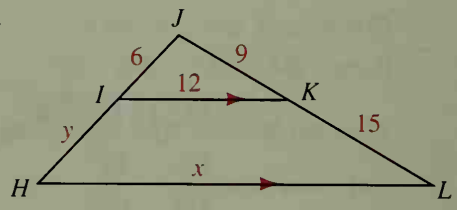
Classroom Exercises

In Exercises 1–8 $\triangle ABC \sim \triangle DEF$. Tell whether each statement must be true.

1. $\triangle BAC \sim \triangle EFD$
2. If $m\angle D = 45$, then $m\angle A = 45$.
3. If $m\angle B = 70$, then $m\angle F = 70$.
4. $AB:DE = EF:BC$
5. $AC:DF = AB:DE$
6. If $\frac{DF}{AC} = \frac{8}{5}$, then $\frac{m\angle D}{m\angle A} = \frac{8}{5}$.
7. If $\frac{DF}{AC} = \frac{8}{5}$, then $\frac{EF}{BC} = \frac{8}{5}$.



8. If the scale factor of $\triangle ABC$ to $\triangle DEF$ is 5 to 8, then the scale factor of $\triangle DEF$ to $\triangle ABC$ is 8 to 5.
9. One right triangle has an angle with measure 37. Another right triangle has an angle with measure 53. Are the two triangles similar? Explain.
10. Name all pairs of congruent angles in the figure.
11. Complete.
    a. $\triangle IKJ \sim$ ___?___
    b. $\frac{?}{x} = \frac{9}{24}$ and $x =$ ___?___
    c. $\frac{9}{24} = \frac{6}{?}$ and $y =$ ___?___



Exs. 10, 11

12. Suppose you want to show $AB \cdot YZ = CD \cdot WX$. What are some proportions that are equivalent to that equation?
13. Cecelia wanted to find the height of a certain tree for a report in her biology class. Her method used shadows as shown in the diagram. She measured the shadow of the tree and found it was 5 m long. She measured her shadow and found it was 0.8 m long.
    a. $\triangle$ ___?___ $\sim \triangle$ ___?___
    b. Complete: $\frac{SC}{?} = \frac{CH}{?}$
    c. If Cecelia is 1.6 m tall, about how tall is the tree?