

11-6 Similar Triangles (Pages 616–621)

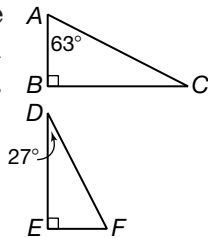
Two figures are **similar** (\sim) if they have the same shape, but not necessarily the same size.

Similar Triangles	<ul style="list-style-type: none"> If the corresponding angles of two triangles have equal measures, the triangles are similar. The sides opposite the corresponding angles are corresponding sides. If two triangles are similar, the measures of their corresponding sides are proportional, and the measures of their corresponding angles are equal.
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Examples

a. Determine whether the pair of triangles shown at the right are similar.

Two triangles are similar if the measures of their corresponding angles are equal.
 $m\angle C = 180^\circ - (90^\circ + 63^\circ) = 27^\circ$
 $m\angle F = 180^\circ - (90^\circ + 27^\circ) = 63^\circ$



Since corresponding angles have equal measures, triangle ABC is similar to triangle FED, or $\triangle ABC \sim \triangle FED$.

b. In the figure below, $\triangle ABC \sim \triangle ADE$. Find the value of x .

Write a proportion matching corresponding sides of each triangle.

$$\frac{BC}{DE} = \frac{AC}{AE}$$

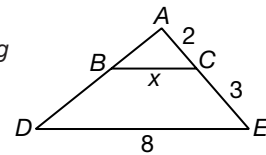
$$\frac{x}{8} = \frac{2}{2+3}$$

$$(2+3)(x) = 8(2)$$

$$5x = 16$$

$$\frac{5x}{5} = \frac{16}{5}$$

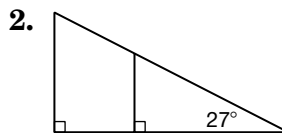
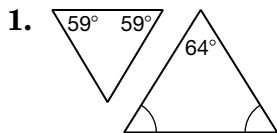
$$x = 3.2$$



Find the cross products.

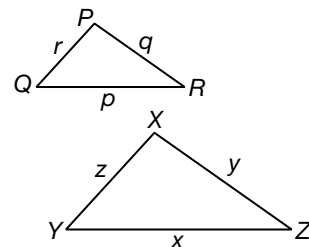
Practice

Determine whether each pair of triangles is similar.



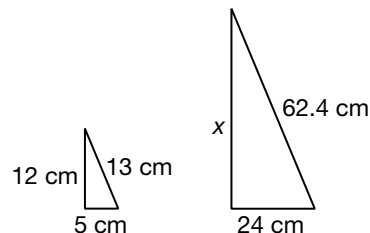
Triangle PQR is similar to triangle XYZ. For each set of measures given, find the measures of the remaining sides.

- $p = 4, q = 3.5, r = 3, x = 8$
- $p = 5, q = 5, r = 2, z = 3$
- $x = 20, y = 18, z = 16, q = 9$
- $x = 22.5, y = 18, z = 15, r = 10$



7. **Standardized Test Practice** The triangles in the figure at the right are similar. Find the value of x .

- A** 24 cm **B** 48 cm
C 57.6 cm **D** 67.6 cm



Answers: 1. no 2. yes 3. $y = 7, z = 6$ 4. $x = 7.5, y = 7.5, z = 7.5$ 5. $p = 10, r = 8$ 6. $d = 15, q = 12, c$