

# Adv. Geometry 6.4 $\Delta's \sim$ by AA

# Key

Use the diagram to complete the statement.

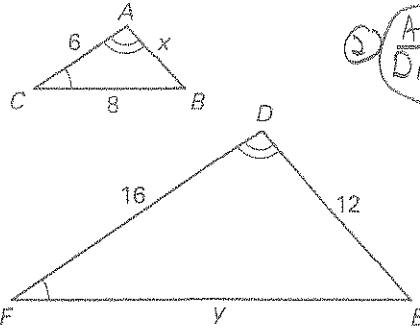
1.  $\Delta ABC \sim \Delta DEF$   
 2.  $\frac{AB}{?} = \frac{?}{EF} = \frac{CA}{?}$

3.  $\angle B \cong \angle E$   
 4.  $\frac{X}{12} = \frac{8}{?}$

5.  $x = 4.5$   
 6.  $y = ?$

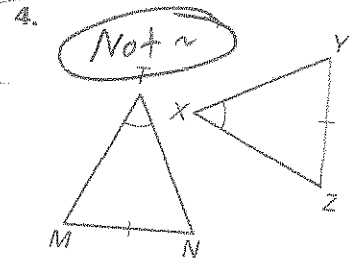
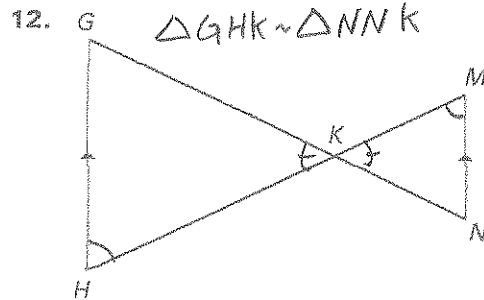
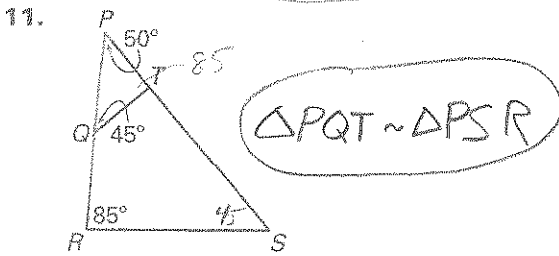
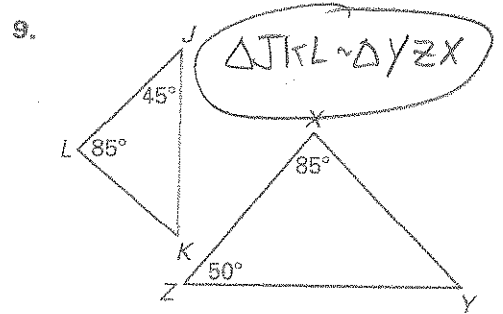
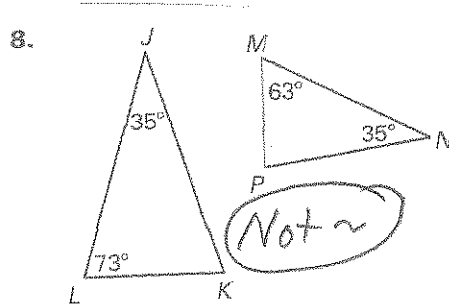
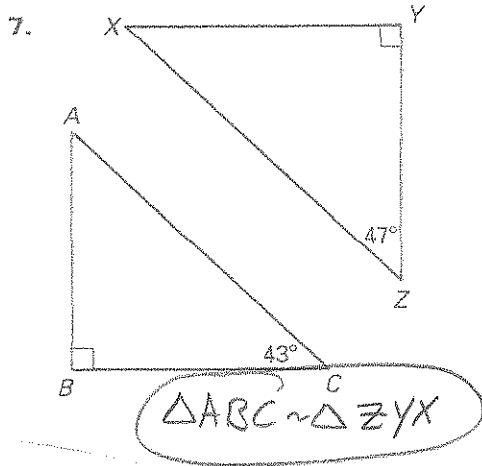
$\frac{6}{16} = \frac{y}{12}$

$\frac{6}{16} = \frac{8}{y}$   $y = 21.3$

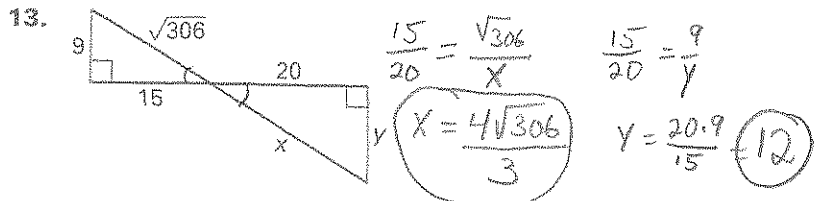
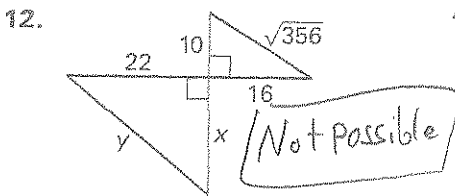
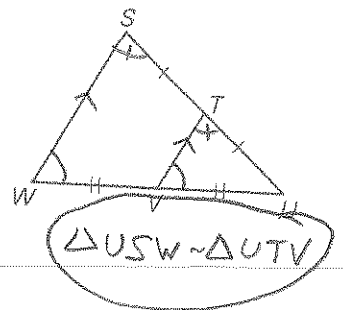
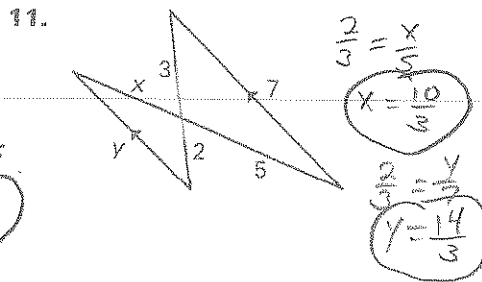
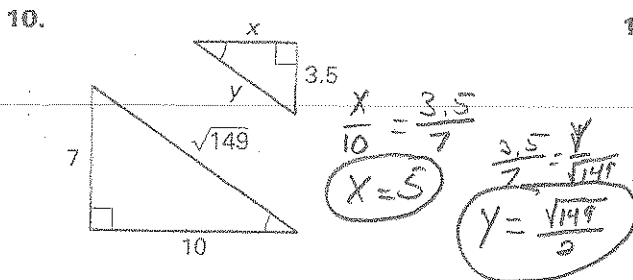


$\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD}$

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

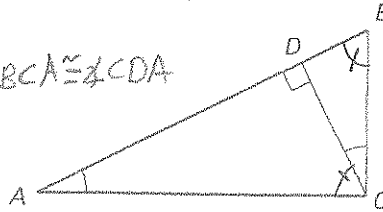


If possible, find the values of the variables.



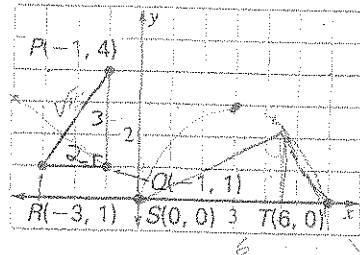
In Exercises 1–4, use the diagram at the right and the fact that  $\angle BCA$  is a right angle.

- PROVE:  $\triangle ABC \sim \triangle ACD$   $\angle BAC \cong \angle CAD$  &  $\angle BCA \cong \angle CDA$
- PROVE:  $\triangle ABC \sim \triangle CBD$   
 $\angle ABC \cong \angle CBD$  &  $\angle BCA \cong \angle BDC$



Use the diagram to find two pairs of coordinates for the point that satisfy the similarity statement.

- Given  $\triangle PQR \sim \triangle STU$ , find the coordinates of  $U$ .
- Given  $\triangle PQR \sim \triangle VST$ , find the coordinates of  $V$ .
- Given  $\triangle PQR \sim \triangle SWT$ , find the coordinates of  $W$ .



$$\frac{3}{2} = \frac{18\sqrt{13}}{12\sqrt{13}}$$

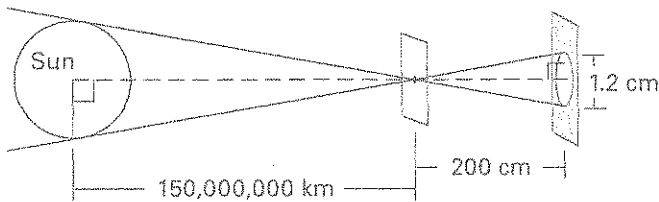
$$\frac{\sqrt{13}}{6} = \frac{2}{x}$$

$$x = \frac{12}{\sqrt{13}} = \frac{12\sqrt{13}}{13}$$

$$\frac{\sqrt{13}}{6} = \frac{3}{y} \quad y = \frac{18}{\sqrt{13}} = \frac{18\sqrt{13}}{13}$$

- (17)  $U(6, 4)$  or  $U(6, -4)$   
 (18)  $V(0, 9)$  or  $V(0, -9)$   
 (19)  $W(\frac{54}{13}, \frac{36}{13})$  or  $W(\frac{54}{13}, -\frac{36}{13})$   
 [work on back of grade sheets]

25. Indirect Measurement To estimate the diameter of the sun, you punch a tiny hole into a piece of paper and hold the paper so the sun shines through the hole onto a screen with a surface perpendicular to the direction of the sun. Using the information in the figure, estimate the diameter of the sun. Explain how you can deduce this.

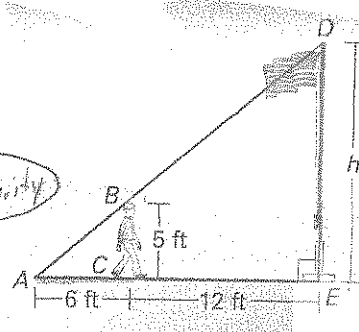


Not drawn to scale

$$\frac{150000000 \text{ km}}{200 \text{ cm}} = \frac{x}{1.2}$$

$$x = 900000 \text{ km}$$

Flag Pole In order to estimate the height  $h$  of a flag pole, a 5 foot tall male student stands so that the tip of his shadow coincides with the tip of the flag pole's shadow. This scenario results in two similar triangles as shown in the diagram.



24.)  $\frac{h}{5} = \frac{18}{6}$   
 25.)  $h = 15 \text{ ft}$

AA similarity

- Why are the two overlapping triangles similar?
- Using the similar triangles, write a proportion that models the situation.
- What is the height  $h$  (in feet) of the flag pole?