UNDERSTAND

PRACTICE

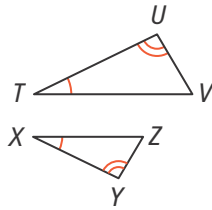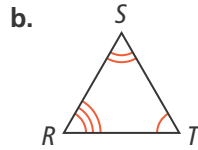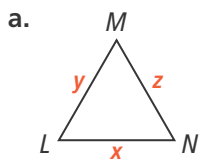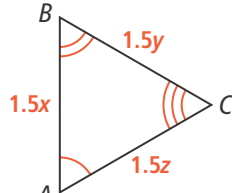**10. Construct Arguments** Write a proof of the Angle-Angle Similarity Theorem.

Given: $\angle T \cong \angle X$
$\angle U \cong \angle Y$

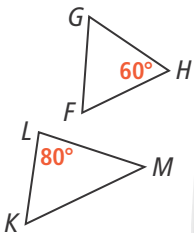**Prove:** $\triangle TUV \sim \triangle XYZ$

11. Use Structure For each triangle, name the triangle similar to $\triangle ABC$ and explain why it is similar.

a.

b.

12. Construct Arguments If two triangles are congruent by ASA, are the triangles similar? Explain.

13. Error Analysis What is Russel's error?
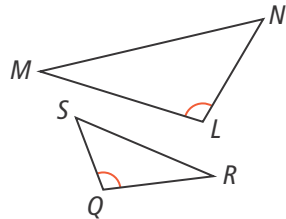
180 – 80 – 60 = 40,
so the unlabeled angle in each triangle is 40°. So, $m\angle M = 60$, and thus $\triangle FGH \sim \triangle KLM$ by AA ~. ✗

14. Construct Arguments Write a proof of the Side-Angle-Side Similarity Theorem.

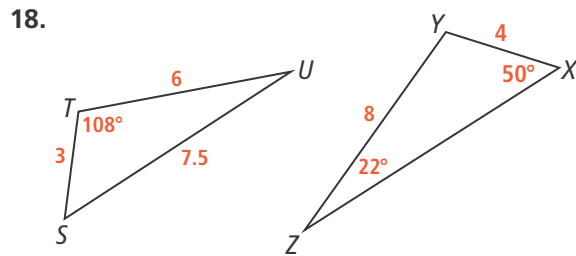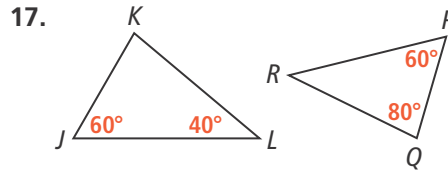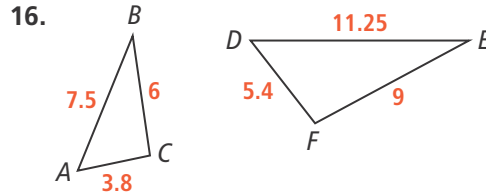**Given:** $\dfrac{LM}{QR} = \dfrac{LN}{QS}$
$\angle L \cong \angle Q$
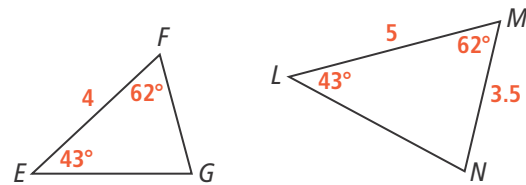
Prove: $\triangle LMN \sim \triangle QRS$

15. Higher Order Thinking Explain why there is no Side-Side-Angle Similarity Theorem.

For Exercise 16–18, explain whether each pair of triangles is similar. SEE EXAMPLES 1–3

16.

17.

18.
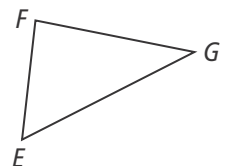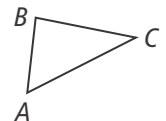
19. What is *FG*? SEE EXAMPLES 4 AND 5

**20. What is the value of *x*?** SEE EXAMPLES 4 AND 5
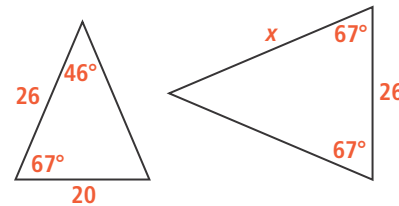
21. Write a proof of the Side-Side-Side Similarity Theorem.

Given: $\dfrac{AB}{EF} = \dfrac{BC}{FG} = \dfrac{AC}{AG}$

**Prove:** $\triangle ABC \sim \triangle EFG$

APPLY

22. Communicate Precisely A building manager needs to order 9 replacement panes that are all the same size, each similar to the window itself. At what angles should each pane be cut in order to fit in the window? What are the dimensions of each pane? Explain.
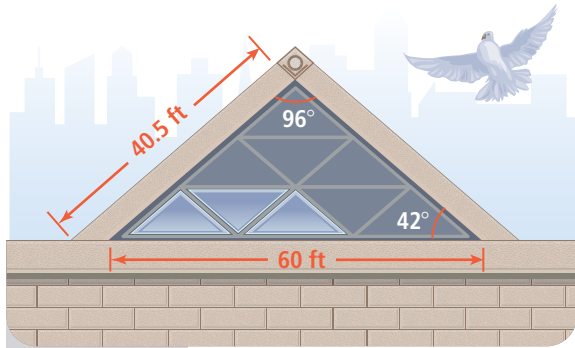
23. Use Structure The screen of a surveying device is 0.0026 m wide and is 0.1 m away from the lens. If the surveyor wants the image of the 2-m target to fit on the screen, what distance d should the lens be from the target? Explain.
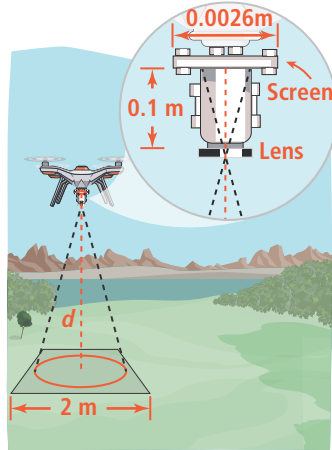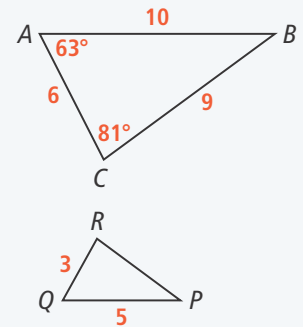

24. Mathematical Connections If a light beam strikes the inside of a fiber optic cable, it bounces off at the same angle. In a cable 1,200 micrometers (μm) long, if the beam strikes the wall after 720 μm what distance $x + y$ does the beam travel? Explain.
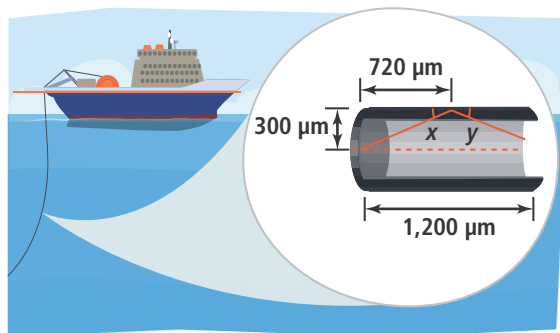
ASSESSMENT PRACTICE

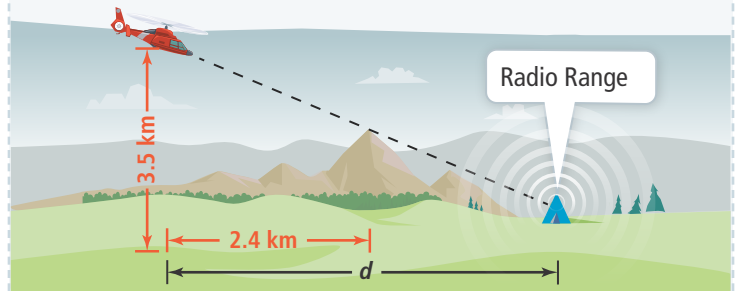**25.** Which condition is sufficient to show that $\triangle ABC \sim \triangle QPR$? Select all that apply.

Ⓐ $RP = 4.5$

Ⓑ $m\angle Q = 63$

Ⓒ $m\angle P = 81$

Ⓓ $m\angle R = 81$

26. SAT/ACT For which value of FJ must $\triangle FGJ$ be similar to $\triangle FHG$?

Ⓐ 6   Ⓑ 8   Ⓒ 9   Ⓓ 12

27. Performance Task A rescue helicopter hovering at an altitude of 3.5 km sights a campsite just over the peak of a mountain.

Part A The horizontal distance of the helicopter from the mountain is 2.4 km. If the height of the mountain is 2.8 km, what is the horizontal distance d of the helicopter from the campsite? Explain.

Part B The groundspeed (horizontal speed) of the helicopter is 1.6 km/min. When will the helicopter reach the campsite? Explain.

Part C The radio at the campsite can only transmit to a distance of 5 km. If the helicopter begins immediately to descend toward the campsite (along the diagonal line), how far will the pilot be, horizontally, when he contacts the campsite?