**LESSON 6.4**

Study Guide

For use with pages 381–387

GOAL **Use the AA Similarity Postulate.**

Vocabulary

Angle-Angle (AA) Similarity Postulate

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

EXAMPLE 1 ## Use the AA Similarity Postulate

Determine whether the triangles are similar. If the are, write a similarity statement. *Explain* your reasoning.
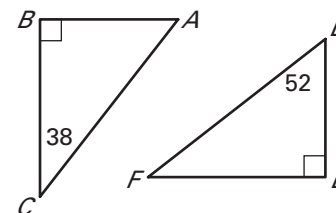
Solution

Because they are both right angles, $\angle B$ and $\angle E$ are congruent.

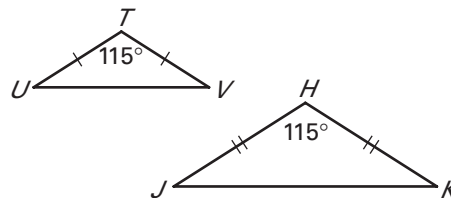By the Triangle Sum Theorem, $38° + 90° + m\angle A = 180°$, so $m\angle A = 52°$. Therefore, $\angle A$ and $\angle D$ are congruent.

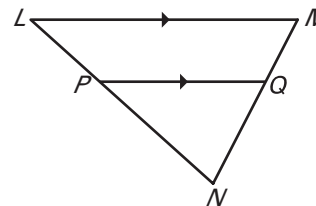So, $\triangle ABC \sim \triangle DEF$ by the AA Similarity Postulate.

EXAMPLE 2 ## Show that triangles are similar

Show that the two triangles are similar.

a. $\triangle TUV$ and $\triangle HJK$

b. $\triangle LMN$ and $\triangle PQN$

Solution

a. Because each triangle is isosceles with a vertex angle of 115°, you can determine that each base angle is 32.5°.

So, $\triangle TUV \sim \triangle HJK$ by the AA Similarity Postulate.

b. The diagram shows that $LM \parallel PQ$, so $\angle L \cong \angle P$ by the Corresponding Angles Postulate. By the Reflexive Property, $\angle N \cong \angle N$.

So, $\triangle LMN \sim \triangle PQN$ by the AA Similarity Postulate.

LESSON 6.4 **Study Guide** *continued*
*For use with pages 381–387*

Exercises for Examples 1 and 2

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

1.

2. 71 19

3. R 72 28 S J T 28 H 82 K

4. X Y Z Q P
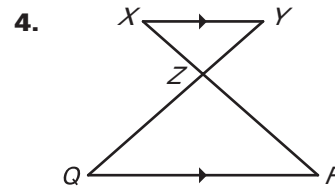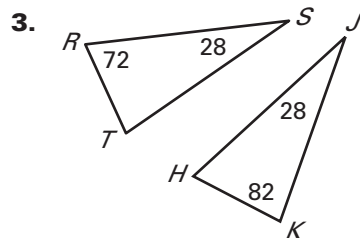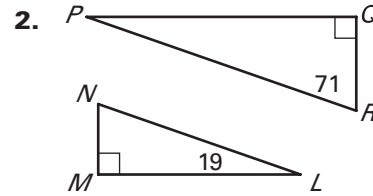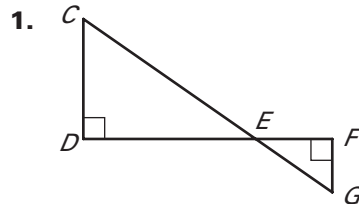
EXAMPLE 3 **Use indirect measurement**

Shadows A building casts a shadow that is 78 feet long. At the same time, a nearby sign post that is 5 feet tall casts a shadow that is 39 inches long. How tall is the building?

Solution

The building and the sign post form sides of two right angles with the ground, as shown in the diagram. The sun's rays hit the building and the sign post at the same angle. You have two pairs of congruent angles, so the triangles are similar by the AA Similarity Postulate. Write 39 inches as 3.25 feet so that all the dimensions are in feet. Then you can write the proportion $\frac{x \text{ ft}}{5 \text{ ft}} = \frac{78 \text{ ft}}{3.25 \text{ ft}}$ to find that

x ft

├78 ft┤

5 ft

├ 39 in.

Not drawn to scale

$x = 120$. So, the building is 120 feet tall.
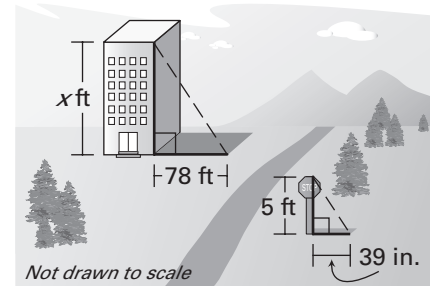
Exercises for Example 3

5. In Example 3, suppose a different building casts a shadow that is 52 feet long. How tall is the building?

6. You and your friend are standing next to one another outside. Your shadow is 23 inches long and your friend's shadow is 24 inches long. You are 5 feet 5 inches tall. How tall is your friend?