

Do Now:

***What do you know about an
Isosceles Triangle?***

***What do you know about an
Equilateral Triangle?***

4.7

Use Isosceles and Equilateral Triangles

VOCABULARY

Legs The legs of an isosceles triangle are the two congruent sides.

Vertex angle The vertex angle of an isosceles triangle is the angle formed by the legs.

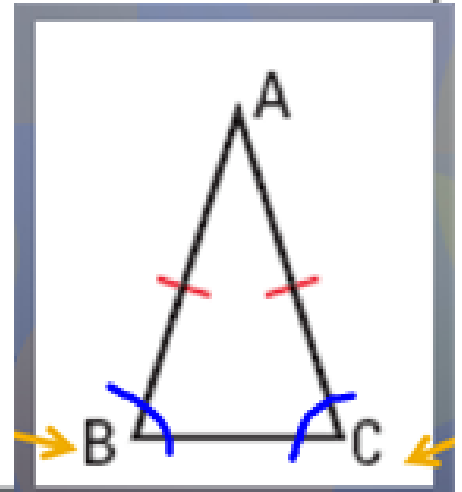
Base The base of an isosceles triangle is the side that is not a leg.

Base angles The base angles of an isosceles triangle are the two angles adjacent to the base.

THEOREM 4.7: BASE ANGLES THEOREM

If two sides of a triangle are congruent, then the angles opposite them are congruent.

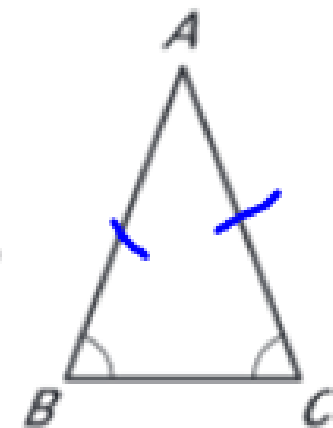
If $\overline{AB} \cong \overline{AC}$, then $\angle B \cong \underline{\angle C}$



THEOREM 4.8: CONVERSE OF BASE ANGLES THEOREM

If two angles of a triangle are congruent, then the sides opposite them are congruent.

If $\angle B \cong \angle C$, then $\overline{AB} \cong \underline{\overline{AC}}$

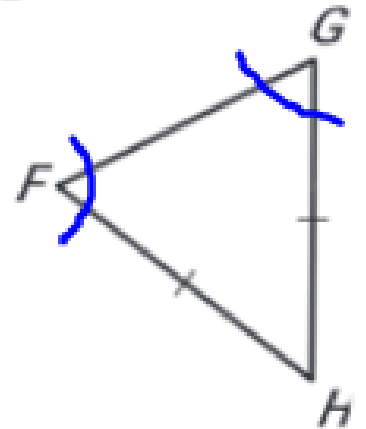


Example 1**Apply the Base Angles Theorem**

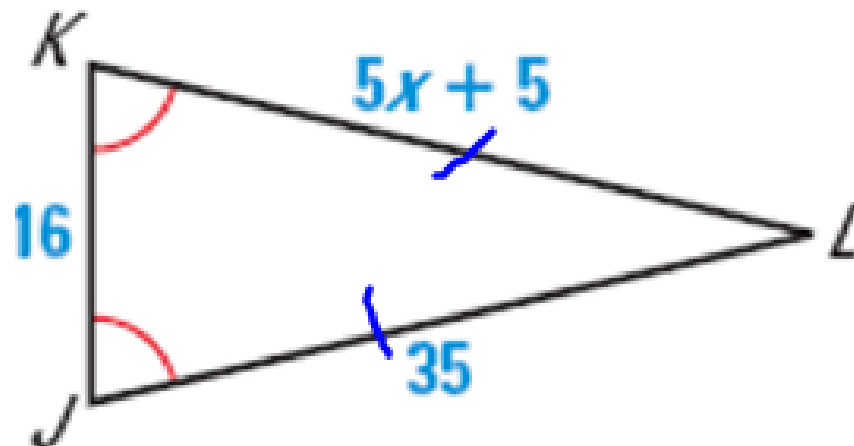
In $\triangle FGH$, $\overline{FH} \cong \overline{GH}$. Name two congruent angles.

Solution

$\overline{FH} \cong \overline{GH}$, so by the Base Angles Theorem,
 $\angle G \cong \angle F$.

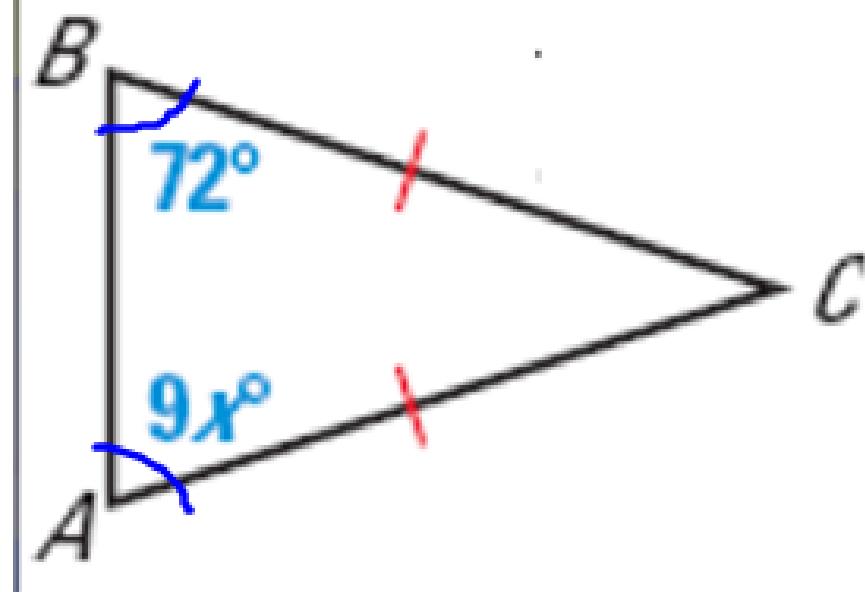


Find the value of x .



$$5x + 5 = 35$$
$$5x = 30$$
$$x = 6$$

Find the value of x .



$$72 = 9x$$

$$x = 8$$

Your Notes

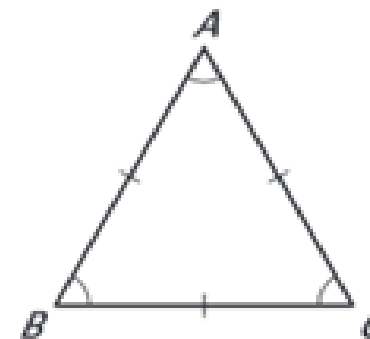
The corollaries state that a triangle is *equilateral* if and only if it is *equiangular*.

COROLLARY TO THE BASE ANGLES THEOREM

If a triangle is equilateral, then it is equiangular.

COROLLARY TO THE CONVERSE OF BASE ANGLES THEOREM

If a triangle is equiangular, then it is equilateral.



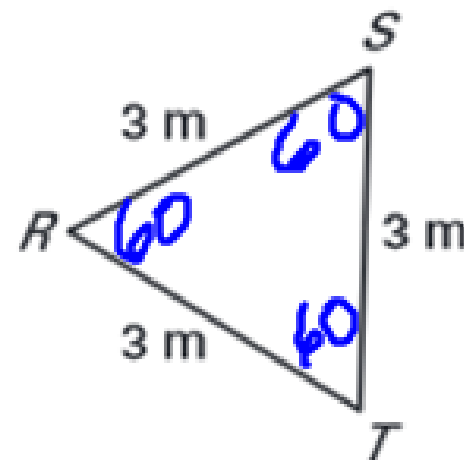
Example 2

Find measures in a triangle

Find the measures of $\angle R$, $\angle S$, and $\angle T$.

Classify the triangle by sides and angles.

$$\frac{180}{3} = 60^\circ$$



✓ **Checkpoint** Complete the following exercises.

1. Copy and complete the statement:

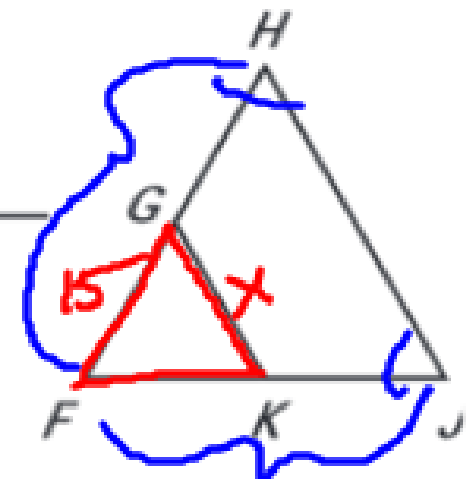
If $\overline{FH} \cong \overline{FJ}$, then $\angle ? \cong \angle ?$.

$$\triangle J \cong \triangle H$$

2. Copy and complete the statement:

If $\triangle FGK$ is equiangular and

$FG = 15$, then $GK = ?$ 15



GIVEN: $\overline{FG} \cong \overline{FJ}$, $\overline{HG} \cong \overline{IJ}$

PROVE: $\overline{HF} \cong \overline{IF}$

Statements

Reasons

1. $\overline{FG} \cong \overline{FJ}$

1. ? **Given**

2. ? **$\angle G \cong \angle J$**

2. Base Angles Theorem

3. $\overline{HG} \cong \overline{IJ}$

3. ? **Given.**

4. ? **$\triangle FGH \cong \triangle FJI$**

4. SAS Congruence Postulate

5. $\overline{HF} \cong \overline{IF}$

5. ? **CPCTC**

