Section 4.6 Isosceles, Equilateral, and Right Triangles

Complete the outline as you view Video Lecture 4.6. Pause the video as needed to fill in the blanks. Then press Play to continue. Also, circle your answer to each numbered exercise.

**Objective 1**  Use Properties of Isosceles and Equilateral Triangles

1. If an isosceles triangle has exactly two congruent (equal measure) sides, then these two sides are its ________. The third side is called the ________.

2. In an isosceles triangle the angle opposite the base is the ________ angle. The other two angles adjacent to the base are the ________ angles.

3. Isosceles Base Angles Theorem: If two sides of a triangle are congruent, then the angles opposite those sides are congruent.

4. Converse of the Isosceles Base Angles Theorem: If two angles of a triangle are congruent, then the sides opposite those angles are congruent.
Section 4.6 Isosceles, Equilateral, and Right Triangles

Perpendicular Bisector of the Base of an Isosceles Triangle: If a line bisects the vertex angle of an isosceles triangle, then the line is also the perpendicular bisector of the base.

**If . . .**  
\( \overline{AB} \cong \overline{AC} \) and \( \angle 1 \cong \angle 2 \)  

**Then . . .**  
\( \overline{AD} \perp \overline{BC} \) and \( \overline{BD} \equiv \overline{DC} \)

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**Work Video Exercises 1 and 2 with me.**

Fill in the blanks.

1. \( m\angle 1 = \) ________ °

2. \( \angle B \cong \angle \) ________

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**Pause and work Video Exercise 3.**

3. Given isosceles \( \triangle JKL \) with base \( \overline{JL} \), find the value.

If \( m\angle JKM = 48^\circ \), then \( m\angle J = \) ____ ?

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**Play and check.**
A(n) _______ is a theorem that can be easily proved from an earlier theorem.

If Equilateral then Equiangular Triangle Corollary: If a triangle is equilateral, then the triangle is equiangular.

If . . .
\[ \overline{AB} \cong \overline{BC} \cong \overline{CA} \]

Then . . .
\[ \angle A \cong \angle B \cong \angle C \]

If Equiangular then Equilateral Triangle Corollary: If a triangle is equiangular, then the triangle is equilateral.

If . . .
\[ \angle A \cong \angle B \cong \angle C \]

Then . . .
\[ \overline{AB} \cong \overline{BC} \cong \overline{CA} \]

Objective 2  Use Properties of Right Triangles

Hypotenuse–Leg (H–L) Theorem: If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent.

If . . .
\[ \Delta PQR \text{ and } \Delta XYZ \text{ are right triangles}, \overline{PR} \cong \overline{XZ}, \text{ and } \overline{PQ} \cong \overline{XY} \]

Then . . .
\[ \Delta PQR \cong \Delta XYZ \]
Work Video Exercise 4 with me.

4. Find the unknown angle measures.

Pause and work Video Exercise 5

5. Find the unknown angle measures.

Play and check.

Work Video Exercise 6 with me.

6. Find the values of $x$ and $y$. 
Pause and work Video Exercise 7.

7. Find the values of $x$ and $y$.

Play and check.

Work Video Exercise 8 with me.

8. Complete the proof.

**Given:** \( RS \equiv TU \), \( RS \perp ST \), \( TU \perp UV \),

\( T \) is the midpoint of \( RV \)

**Prove:** \( \triangle RST \equiv \triangle TUV \)