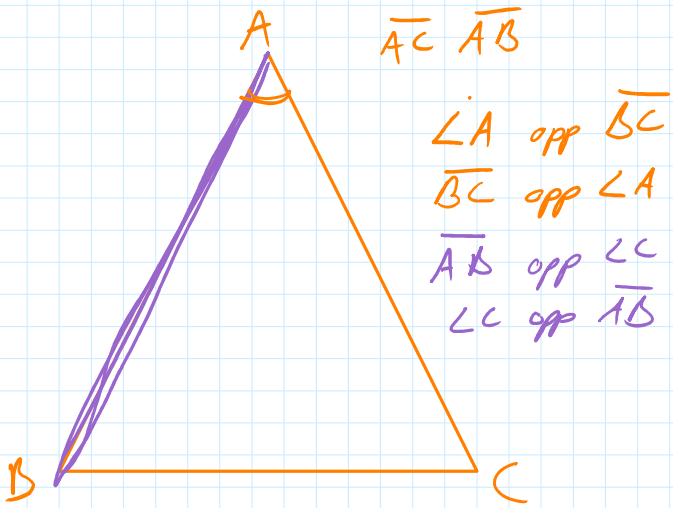
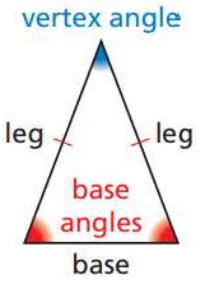
What You Will Learn

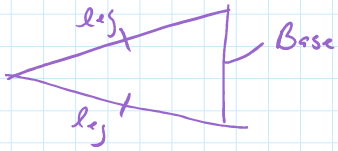
- Use the Base Angles Theorem.
- Use isosceles and equilateral triangles.



Using the Base Angles Theorem

A triangle is isosceles when it has at least two congruent sides. When an isosceles triangle has exactly two congruent sides, these two sides are the **legs**. The angle formed by the legs is the **vertex angle**. The third side is the **base** of the isosceles triangle. The two angles adjacent to the base are called **base angles**.





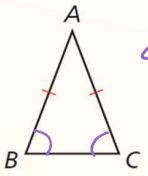
Theorems

Theorem 5.6 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 $\angle B \cong \angle C$.

Proof p. 252



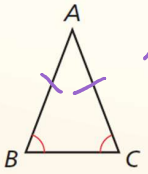
$\angle B \cong \angle C$

Theorem 5.7 Converse of the 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 $\overline{AB} \cong \overline{AC}$.

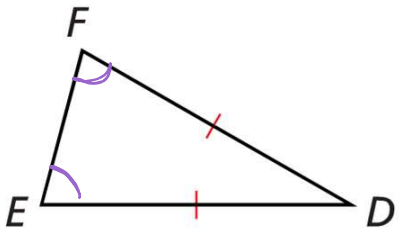
Proof Ex. 27, p. 275



$\overline{AC} \cong \overline{AB}$

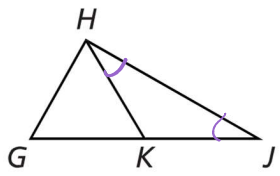
In $\triangle DEF$, $\overline{DE} \cong \overline{DF}$. Name two congruent angles.

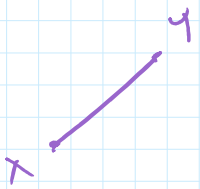
$\angle F \cong \angle E$



Copy and complete the statement.

1. If $\overline{HG} \cong \overline{HK}$, then $\angle GKH \cong \angle HGK$.
2. If $\angle KHJ \cong \angle KJH$, then $\overline{KJ} \cong \overline{HK}$.





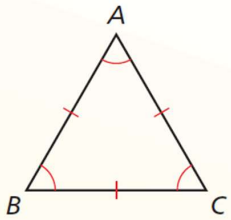
$\overline{KJ} \cong \overline{HK}$

Corollaries

Corollary 5.2 Corollary to the Base Angles Theorem

If a triangle is equilateral, then it is equiangular.

Proof Ex. 37, p. 258; Ex. 10, p. 353



Corollary 5.3 Corollary to the Converse of the Base Angles Theorem

If a triangle is equiangular, then it is equilateral.

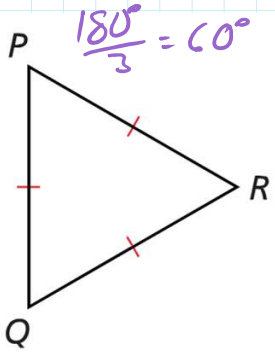
Proof Ex. 39, p. 258

Find the measures of $\angle P$, $\angle Q$, and $\angle R$.

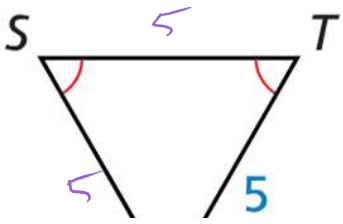
$m\angle P = 60°$

$m\angle Q = 60°$

$m\angle R = 60°$

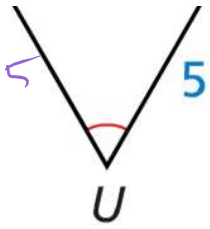


$\frac{180°}{3} = 60°$



Find ST & SU

$ST = 5$



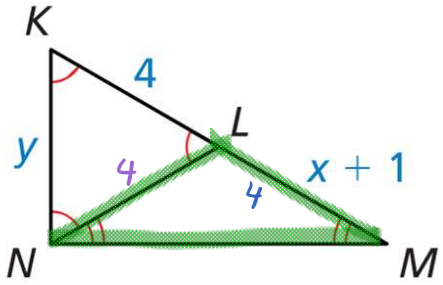
$ST = 5$

$SU = 5$

Find the values of x and y in the diagram.

$y = 4$

$x = 3$



$4 = x + 1$

$-1 \quad -1$

$3 = x$

Find the values of x and y in the diagram.

~~$x = 60$~~

$x = 60$

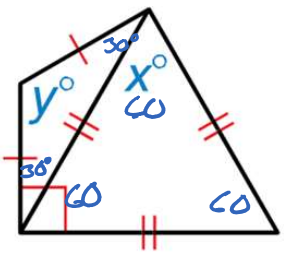
$y = 120$

180

-30

-30

120



Sec. 5.4, Pg. 256
1, 2, 3-15EO, 42-44A