Section 4.5

Isosceles Triangles

Name: Notes

Date: _____ Period: _____

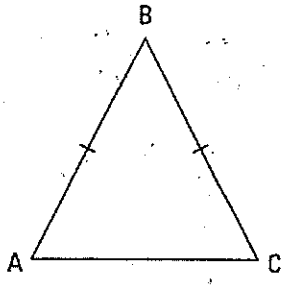
Essential Question

Can I use and apply properties of isosceles triangles?

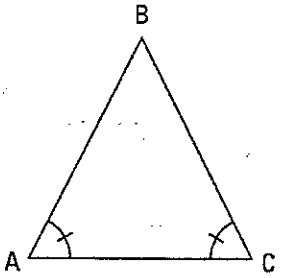
Isosceles Triangle Theorem

ITT

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



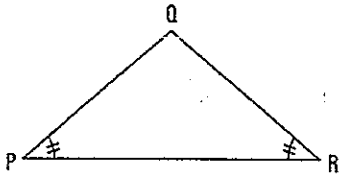
If you know this . . .



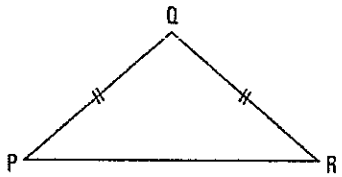
. . . you can conclude this.

Converse of Isosceles Triangle Theorem

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



If you know this . . .

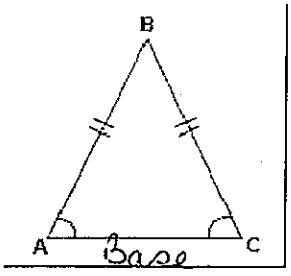


. . . you can conclude this.

Properties of Equilateral Triangles

If a triangle is equilateral, then the triangle is equiangular.
If a triangle is equiangular, then the triangle is equilateral.

Example #1



Given isosceles triangle ABC, find the following:

Name the base: $\overline{AC}$ - between 2 equal angles

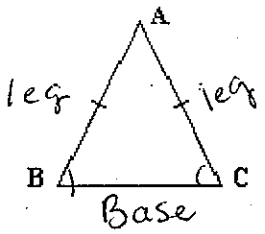
Name the vertex angle: B = opposite the base

Name the legs: $\overline{BA}$, $\overline{BC}$ = 2 congruent sides

Name the base angles: $\angle A$ + $\angle C$

Name the vertex: point B

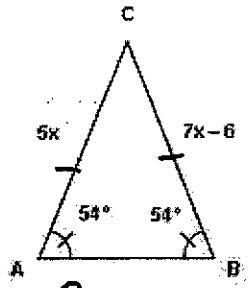
Example #2



Given the diagram, name the angles that must be equal.

$\angle B = \angle C$

Example #3



If Base angles are $\cong$ the legs are also $\cong$

Write an equation to find the value of x.

$5x = 7x - 6$

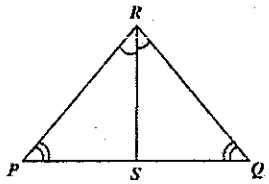
$-7x \quad -7x$

$-2x = -6$

$\frac{-2x}{-2} = \frac{-6}{-2}$

$x = 3$

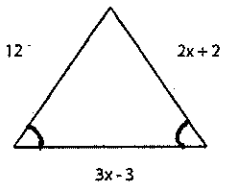
Example #4



Given the diagram, name the sides that must be equal.

$\overline{PR} = \overline{QR}$

Example #5



Write an equation to find the value of x.

$2x + 2 = 12$

$-2 \quad -2$

$2x = 10$

$x = 5$

Base $= 3(5) - 3$

$15 - 3 = 12$

Summary