Your Name

Mrs. Theo

1/12/22

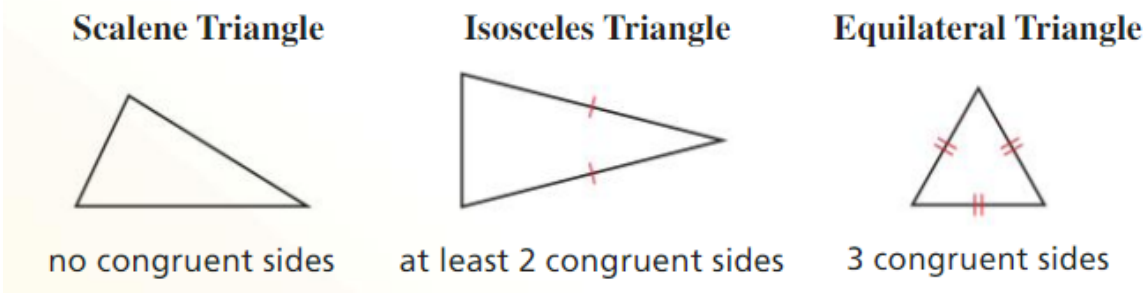
Notes

5.1 - Angles in Triangles

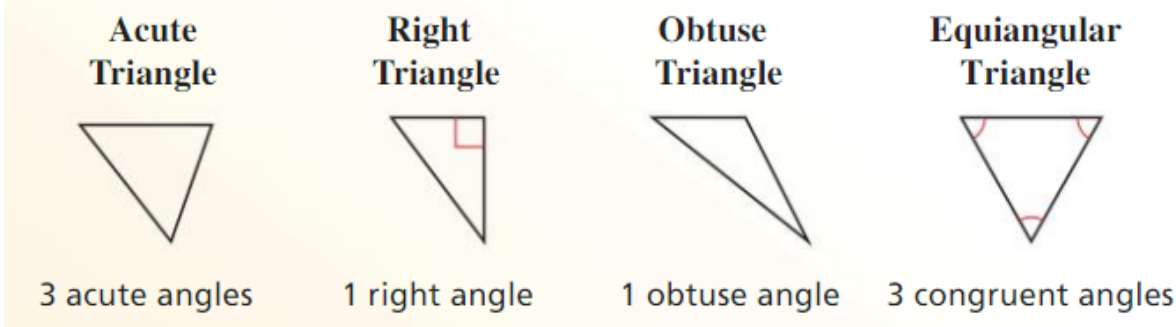
Lesson Objectives

- Find interior and exterior angles of triangles
- Classify triangles by side lengths and angle measures

Classifying Triangles by Side Length

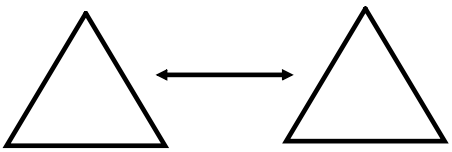


Classifying Triangles by Angle Measure



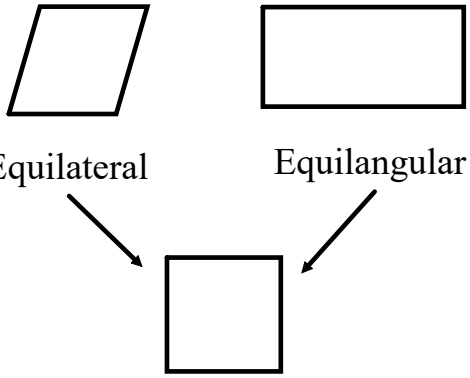
Equilateral vs. Equiangular

Triangles



Equilateral Equilangular

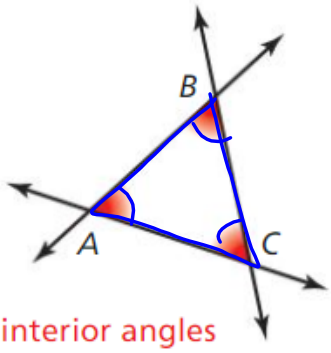
Other Polygons



Equilateral Equilangular

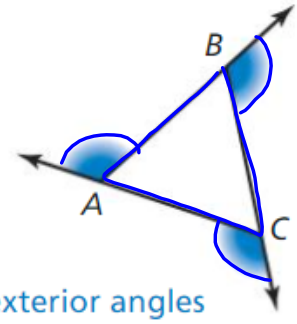
Both = **Regular** Polygon

Angle Measures in Triangles



interior angles

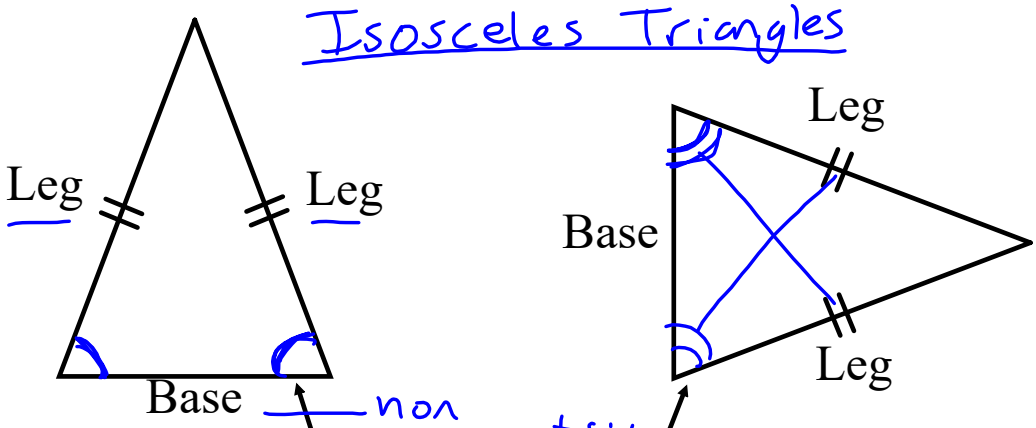
inside



exterior angles

outside

Isosceles Triangles



non congruent side

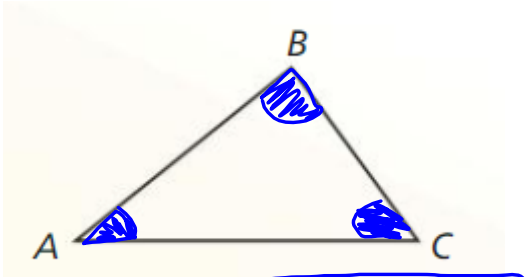
Legs are the congruent sides

Base Angles are ≅ congruent
(in isos triangles)

opposite legs

Triangle Sum Theorem

The sum (add) of the measures of the interior (inside) angles of a triangle is 180°.

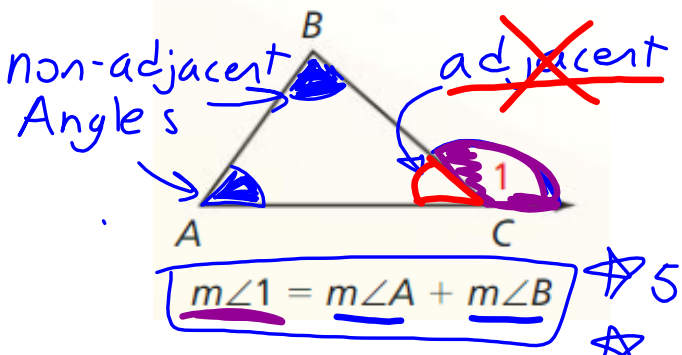


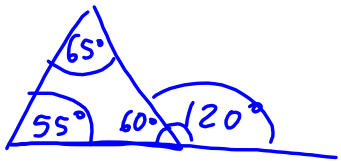
$m\angle A + m\angle B + m\angle C = 180°$

Exterior Angle Theorem

The measure of an exterior angle in a triangle is equal to the sum of the non-adjacent interior angles.

not next to





★ 55+65+60 = 180

★ 60+120 = 180

55+65+60 = 60+120

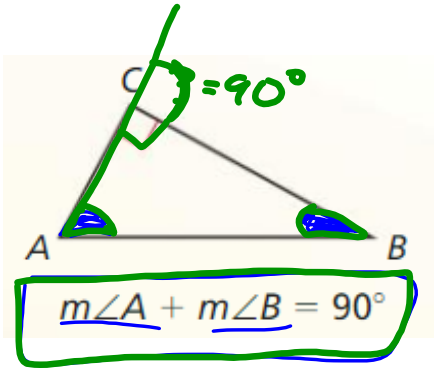
−60 −60

55+65 = 120 ✓

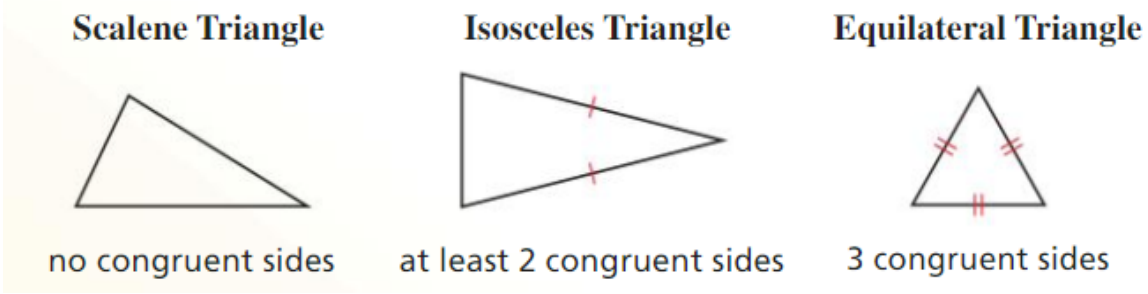
Corollary to the Exterior Angle Theorem

The acute angles of a right triangle are complementary.

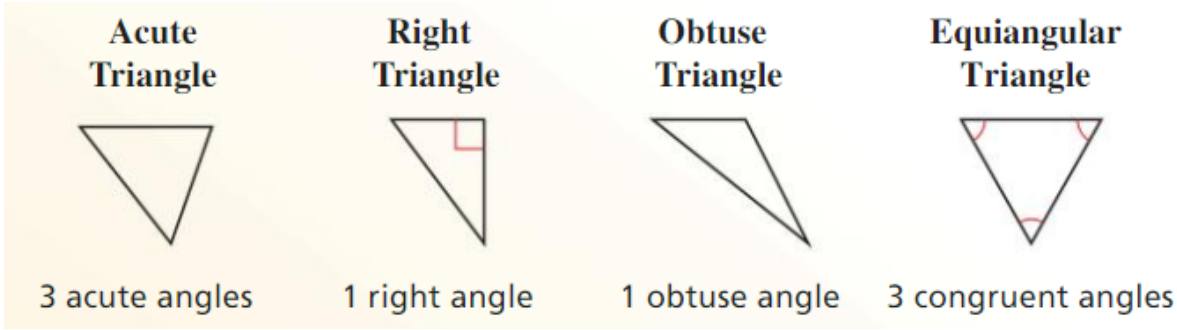
adds to 90



Classifying Triangles by Side Length



Classifying Triangles by Angle Measure

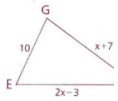


	Acute All angles acute	**Right** 1 right angle 2 acute angles	**Obtuse** 1 obtuse angle 2 acute angles	**Equiangular** All angles congruent All angles 60°
Scalene No congruent sides				NA
Isosceles At least 2 congruent sides				
Equilateral All sides congruent		NA	NA	

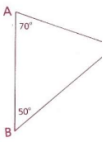
	Acute All angles acute	**Right** 1 right angle 2 acute angles	**Obtuse** 1 obtuse angle 2 acute angles	**Equiangular** All angles congruent All angles 60°
Scalene No congruent sides				
Isosceles At least 2 congruent sides				
Equilateral All sides congruent				

Unit 05 - Section 01

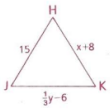
1 If the perimeter of $\triangle EFG$ is 32, is $\triangle EFG$ scalene, isosceles, or equilateral?



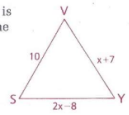
4 Using the figure as marked, write a paragraph proof showing that $\triangle ABC$ is acute.



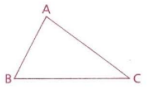
6 If $\triangle HJK$ is equilateral, what are the values of x and y?



11 If $\triangle VSY$ is isosceles and its perimeter is less than 45, which side of $\triangle VSY$ is the base?



12 Given: $AB = x + 3$,
$AC = 3x + 2$,
$BC = 2x + 3$;
Perimeter of $\triangle ABC = 20$.
Show that $\triangle ABC$ is scalene.

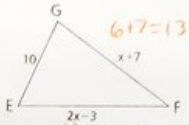


16 How many different isosceles triangles can you find that have sides that are whole-number lengths and that have a perimete of 18?

Unit 05 - Section 01

1 If the perimeter of $\triangle EFG$ is 32, is $\triangle EFG$ scalene, isosceles, or equilateral?

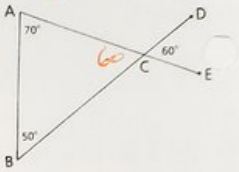
$10 + x + 7 + 2x - 3 = 32$
$3x + 14 = 32$
$3x = 18$
$x = 6$
Scalene



$6+7=13$
$2(6)-3=9$

4 Using the figure as marked, write a paragraph proof showing that $\triangle ABC$ is acute.

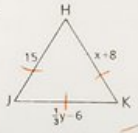
By vertical angles are congruent $\angle ACB = 60°$ Since all 3 angles are less than 90, This is an acute triangle



6 If $\triangle HJK$ is equilateral, what are the values of x and y?

$15 = x + 8$
$7 = x$

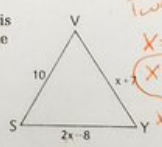
$15 = \frac{1}{3}y - 6$
$3(21) = (\frac{1}{3}y)3$
$63 = y$



11 If $\triangle VSY$ is isosceles and its perimeter is less than 45, which side of $\triangle VSY$ is the base? $10 + x + 7 + 2x - 8 < 45$
$3x + 9 < 45$
$3x < 36$
$x < 12$

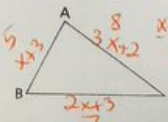
Two sides are equal
Can't be negative

$x = 3$ 10, 10, 2
$x = 9$ 10, 10, 16 base
$x = 15$ 22, 22, 10
$P = 54$ base



12 Given: $AB = x + 3$,
$AC = 3x + 2$,
$BC = 2x + 3$;
Perimeter of $\triangle ABC = 20$.
Show that $\triangle ABC$ is scalene.
Sides are 5, 8, 7 which are all unequal

$x+3+3x+2+2x+3=20$
$6x+8=20$
$6x=12$
$x=2$



16 How many different isosceles triangles can you find that have sides that are whole-number lengths and that have a perimeter of 18? 1,1,16 | 2,2,14, | 3,3,12 | 4,4,10 | 5,5,8 | 6,6,6 | 7,7,4 | 8,8,2

(4)