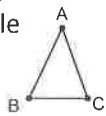
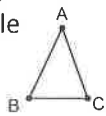






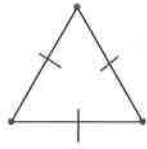
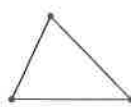
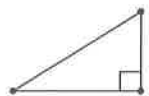
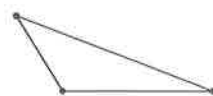
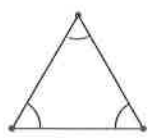
- I can classify triangles and find measures of their angles

A **triangle** is a polygon with three sides. We name a triangle using the vertices of the triangle. For example, the triangle  is called "triangle ABC" or using notation it would be $\triangle ABC$.



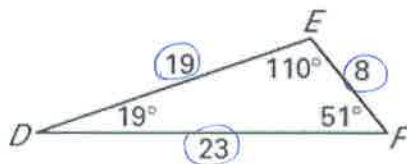
We can classify a triangle using its side lengths and its angle measures.

Using the page from the book displayed on the board, please fill in the following information :

CLASSIFYING TRIANGLES BY SIDE LENGTH			
<p>Scalene Triangle</p>  <p><u>all 3 sides have different lengths</u></p>	<p>Isosceles Triangle</p>  <p><u>two sides are the same length</u></p>	<p>Equilateral Triangle</p>  <p><u>all three sides are the same length</u></p>	
CLASSIFYING TRIANGLES BY ANGLE MEASURE			
<p>Acute triangle</p>  <p><u>all 3 angles are acute (less than 90°)</u></p>	<p>Right Triangle</p>  <p><u>exactly one 90° angle</u></p>	<p>Obtuse Triangle</p>  <p><u>exactly one obtuse angle (greater than 90°)</u></p>	<p>Equiangular Triangle</p>  <p><u>all 3 angles are congruent</u></p>

Example 1: Classify the triangle by its sides and by its angles.

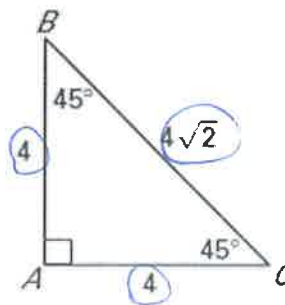
a.



Sides: Scalene

Angles: Obtuse (b/c of the 110°)

b.

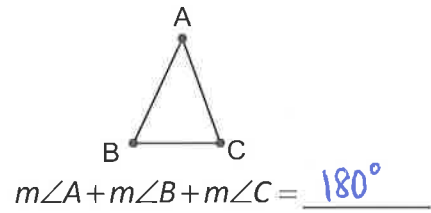


Sides: isosceles
angles: right

Every triangle has three angles, one at each vertex inside the triangle. These angles are called *interior angles*.

Theorem 4.1 – Triangle Sum Theorem

The sum of the measure of the interior angles of a triangle is 180° .



Example 2: Find angle measures in triangles.

Find x . Then classify the triangle by its angles.

a) $2x + x + 90 = 180$
 $3x + 90 = 180$
 $3x = 90$
 $x = 30$

Classification: Right Δ
 (one angle is 90°)

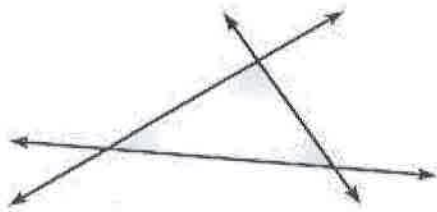
b) $3x + 2x + 55 = 180$
 $5x + 55 = 180$
 $5x = 125$
 $x = 25$

Classification: Acute Δ
 (all angles are less than 90°)

c) $90 + 4x - 5 + 3x + 11 = 180$
 $7x + 96 = 180$
 $7x = 84$
 $x = 12$

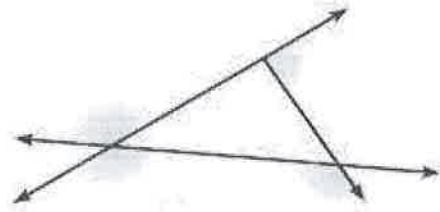
Classification: Right Δ

ANGLES When the sides of a polygon are extended, other angles are formed. The original angles are the **interior angles**. The angles that form linear pairs with the interior angles are the **exterior angles**.



interior angles

(inside) add to 180°

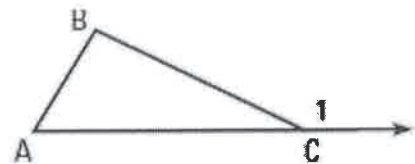


exterior angles

(outside)

THEOREM 4.2 – Exterior Angle Theorem

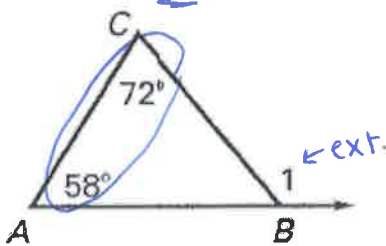
Words The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.



Symbols: $m\angle 1 = m\angle A + m\angle B$

Example 3 : Find an Angle Measure

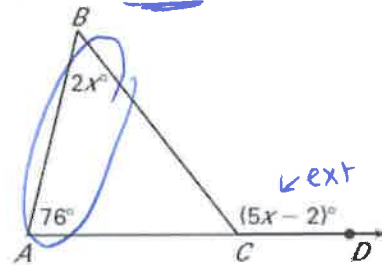
a) Find $m\angle 1$.



$$m\angle 1 = 58 + 72$$

$$m\angle 1 = 130^\circ$$

b) Find $m\angle BCD$.



$$5x - 2 = 2x + 76$$

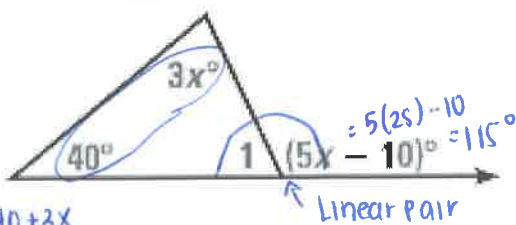
$$3x - 2 = 76$$

$$3x = 78 \Rightarrow x = 26$$

$$m\angle BCD = 5(26) - 2$$

$$m\angle BCD = 128^\circ$$

c) Find $m\angle 1$.



$$5x - 10 = 40 + 3x$$

$$2x - 10 = 40$$

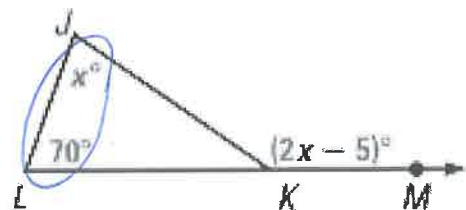
$$2x = 50$$

$$x = 25$$

$$m\angle 1 + 115 = 180$$

$$m\angle 1 = 65^\circ$$

d) Find $m\angle JKM$.



$$2x - 5 = x + 70$$

$$x - 5 = 70$$

$$x = 75$$

$$m\angle JKM = 2(75) - 5$$

$$m\angle JKM = 145^\circ$$