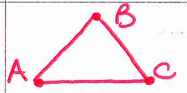
NOTES 5.1 – CLASSIFYING TRIANGLES

Objective: I can classify Δs & use the Δ sum theorem exterior ∡ theorem to find ∡ measures.

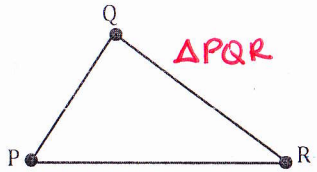
TERM	DESCRIPTION	SKETCH
Triangle	A plane, closed figure formed by 3 segments joining 3 non-collinear points.	 ΔABC

A triangle is made up of three components:

Vertices: Points – P, Q, & R

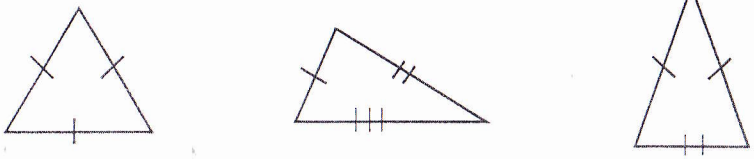
Sides: Segments – $\overline{PQ}$, $\overline{QR}$, & $\overline{PR}$

Angles: ∡P, ∡Q, & ∡R



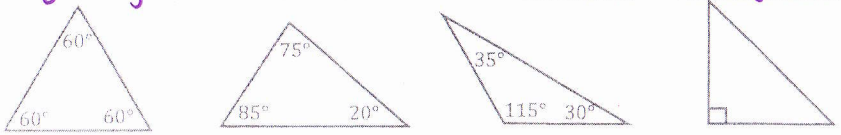
EXAMPLE 1: Classify each of the triangles by SIDES.

a) Equilateral b) Scalene c) Isosceles



EXAMPLE 2: Classify each of the triangles by ANGLES.

a) Equiangular b) Acute c) Obtuse d) Right



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Triangles can be classified by either angles or sides.

Acute	Triangle Sum Theorem
Obtuse	Isosceles
Right	Scalene
Equiangular	Equilateral

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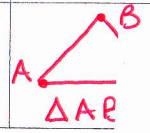
Triangle	A plane, closed figure formed by 3 segments joining 3 non-collinear points.	

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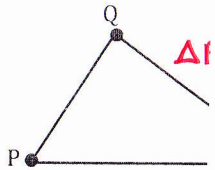

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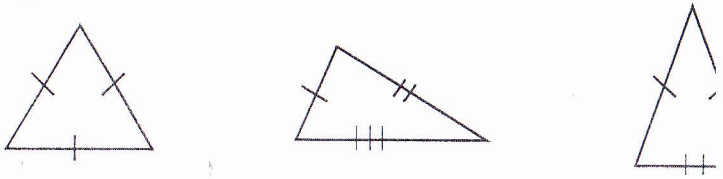
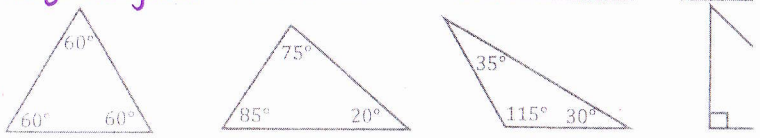
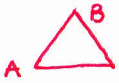
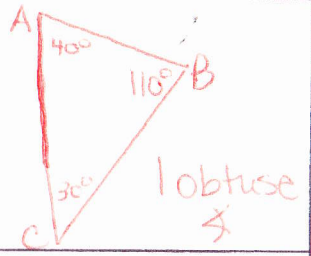
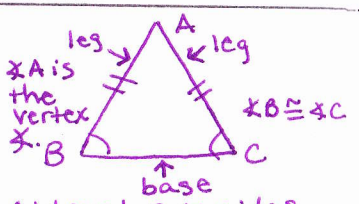
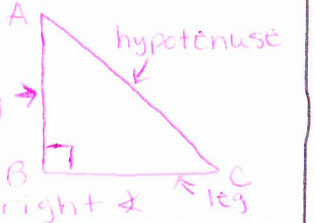
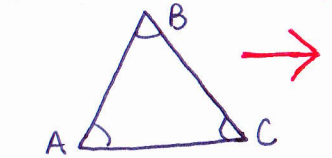
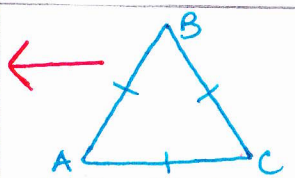


EXAMPLE 2: Classify each of the triangles by ANGLES.

a) Equiangular b) Acute c) Obtuse d) Rig.



Triangles can be classified by either angles or sides.

3 acute ∡s	The sum of the measures of the ∡s in a Δ is 180°  m∡A + m∡B + m∡C = 180°
 1 obtuse ∡	 At least 2 ≅ sides ∡B & ∡C are the base ∡s.
 1 right ∡ ∡A & ∡C are complementary.	 No ≅ sides
 3 ≅ acute ∡s m∡A = m∡B = m∡C = 60°	 3 ≅ sides AB = BC = AC

EXAMPLE 3: Find the measure of the third angle of a triangle, if the first angle has a measure of 66° and the second angle measures 37°.

Δ Sum Theorem

$66+37+x=180$

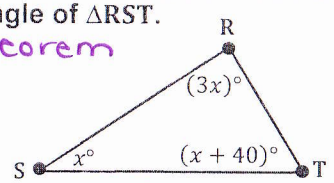
$103+x=180$

$x=77$

77°

EXAMPLE 4: Find the measure of each angle of ΔRST.

Δ Sum Theorem



$m\angle R =$ 84°

$m\angle S =$ 28°

$m\angle T =$ 68°

$x+3x+x+40=180$

$5x+40=180$

$5x=140$

$x=28$

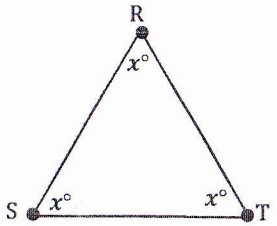
EXAMPLE 5: Find the value of 'x'.

$x =$ 60

$x+x+x=180$

$3x=180$

$x=60$



Based on this example, we can say that each angle of an equiangular triangle is 60°.

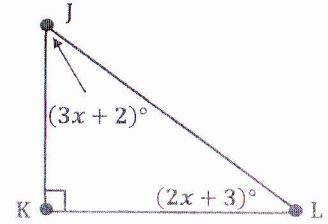
EXAMPLE 6: Find the value of 'x'.

$3x+2+2x+3=90$

$5x+5=90$

$5x=85$

$x=17$



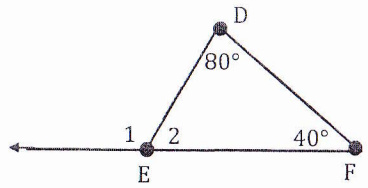
$x =$ 17

∠J and ∠L are classified as ***acute angles***. Since their sum is 90°, we can say that the acute angles of a right triangle are ***complementary***.

An exterior angle of a triangle is formed by one side of the triangle and the extension of an adjacent side.

To find the measure of an exterior angle of a triangle, add the two remote interior angles.

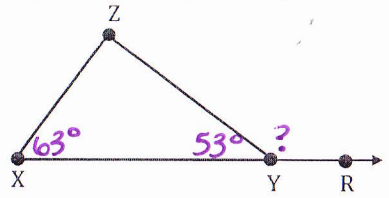
EXAMPLE 7: Find the measure of ∠1.



$m\angle 1 = 80+40$

$m\angle 1 =$ 120°

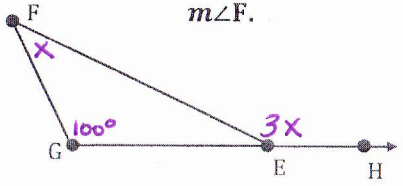
EXAMPLE 8: In ΔXYZ, $m\angle X = 63°$ and $m\angle XYZ = 53°$, find $m\angle ZYR$.



$180-53=127$

$m\angle ZYR =$ 127°

EXAMPLE 9: In ΔEFG, $m\angle G = 100°$ and $m\angle FEH = 3 \cdot m\angle F$. Find $m\angle F$.



$x+100=3x$

$100=2x$

$50=x$

$m\angle F =$ 50°