1.5 – ANGLES

Objective: I can name an angle, use the ∡ addition postulate, classify ∡s, and solve problems with ∡ bisectors.

ANGLE: A figure formed by 2 rays, or sides, with a common endpoint called the vertex.

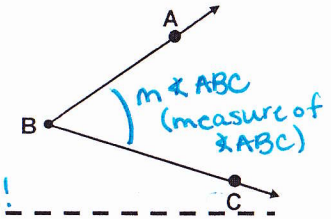
EXAMPLE 1: Name each of the following.

Sides: $\overrightarrow{BA}$ & $\overrightarrow{BC}$

Vertex: B

Name: ∡ABC OR ∡CBA

* Middle letter must be the vertex!



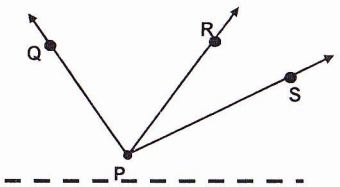
EXAMPLE 2: How does the diagram in EXAMPLE 1 differ from the diagram in this example?

There are 3 ∡s!

∡QRP

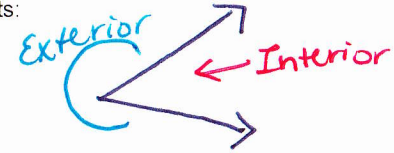
∡RPS

∡QPS



An angle separates a plane into three distinct parts:

- Interior
- Exterior
- The ∡ itself



EXAMPLE 3: A) Name a point in the interior of $< QPS$ in EXAMPLE 2.

R

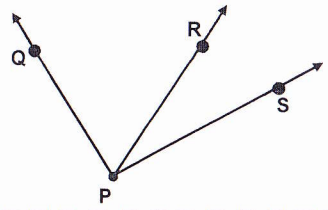
B) Name a point in the exterior of $< QPR$ in EXAMPLE 2.

S

The diagram in EXAMPLE 2 suggests the following postulate:

ANGLE ADDITION POSTULATE: If R is in the interior of $< QPS$, then $m < QPR + m < RPS = m < QPS$. If $m < QPR + m < RPS = m < QPS$, then R is in the interior of $< QPS$.

Little ∡ + Little ∡ = Big ∡

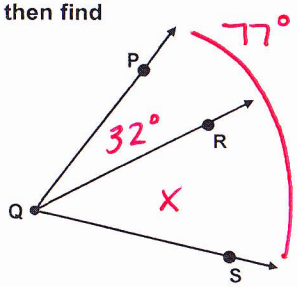


EXAMPLE 4: If $m < PQS = 77°$ and $m < PQR = 32°$, then find $m < RQS$.

$32 + x = 77$

$x = 45$

$m∡RQS = 45°$



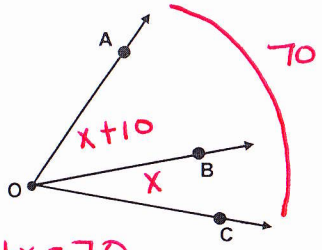
EXAMPLE 5: If $m < AOC = 70°$, $m < AOB = (x + 10)°$, and $m < BOC = x°$, find:

$x =$ 30

$m < BOC =$ 30°

$m < AOB =$ 40°

* Variables don't get units!



$x + 10 + x = 70$

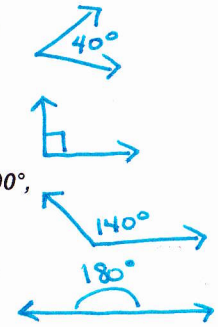
$2x + 10 = 70$

$2x = 60$

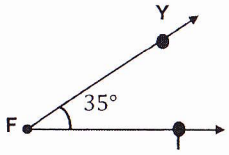
$x = 30$

Angles can be classified by their measure in degrees.

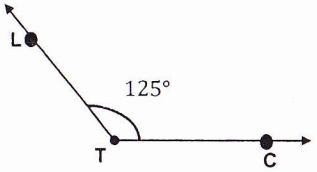
- If an angle has a degree measure ***less than 90°,*** it is classified as an ***<u>acute angle.</u>***
- If an angle has a degree measure ***equal to 90°,*** it is classified as a ***<u>right angle.</u>***
- If an angle has a degree measure ***greater than 90°,*** it is classified as an ***<u>obtuse angle.</u>***
- If an angle has a degree measure ***equal to 180°,*** it is classified as a ***<u>straight angle.</u>***



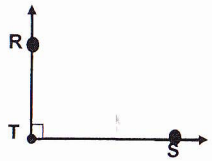
EXAMPLE 6: For each of the following angles A) Name it. B) Tell whether its measure is $< 90°$, $> 90°$, $= 90°$, or $= 180°$. C) Classify it.



NAME: ∡YFI OR ∡IFY
MEASURE: 35°
CLASSIFICATION: Acute



NAME: ∡LTC OR ∡CTL
MEASURE: 125°
CLASSIFICATION: Obtuse



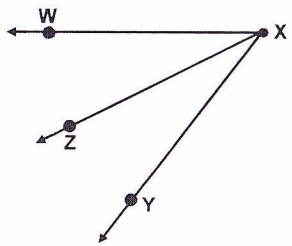
NAME: ∡RTS OR ∡STR
MEASURE: 90°
CLASSIFICATION: Right

NAME: ∡NXS OR ∡SXN
MEASURE: 180°
CLASSIFICATION: Straight

When angles have the same measure, they are said to be ***congruent.***

ANGLE BISECTOR: A ray that divides an angle into 2 ≅ angles.

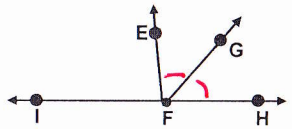
EXAMPLE 7: If $\overrightarrow{XZ}$ is an angle bisector of $< WXY$, name the two congruent angles that it forms.



∡WXZ ≅ ∡ZXY

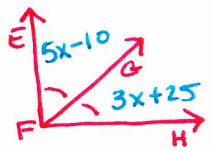
m∡WXZ = m∡ZXY

$\overrightarrow{FG}$ bisects $< EFH$. Find the value of x for each of the following.



EXAMPLE 8:

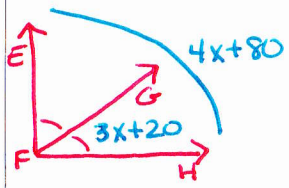
$m < EFG = (5x - 10)°$
$m < GFH = (3x + 25)°$



$5x - 10 = 3x + 25$
$2x = 35$
$x = \frac{35}{2}$

EXAMPLE 9:

$m < GFH = (3x + 20)°$
$m < EFH = (4x + 80)°$



$2(m\angle GFH) = m\angle EFH$
$2(3x+20) = 4x+80$
$6x+40 = 4x+80$
$2x = 40$
$x = 20$