Geometry H Name: Key

Section 1.4 Notes: Measure and Classify Angles Date: ______________ Period: _____

LEARNING TARGETS

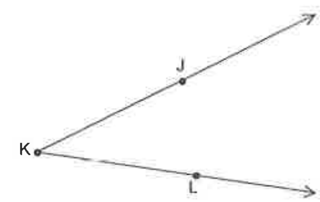
- I can name, measure, and classify angles.
- I can use the Angle Addition Postulate to find measure of angles.
- I can use angle postulates to identify congruent angles.

An ***angle*** is a figure formed by two different rays that have the same initial point. The two rays are the ***sides*** of the angle. The initial point is called the ***vertex*** of the angle.

→ In the diagram to the right, the sides are $\overrightarrow{KJ}$ and $\overrightarrow{KL}$.

→The vertex is Point K.

→The name of the angle is ∠JKL, ∠LKJ, ∠K.



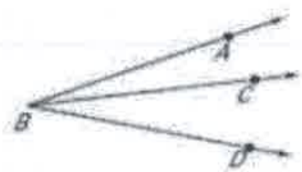
Example 1: Naming Angles

Name the three angles in the diagram below.

∠ABC or ∠CBA

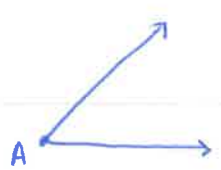
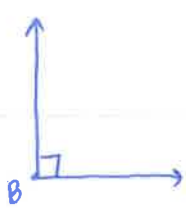
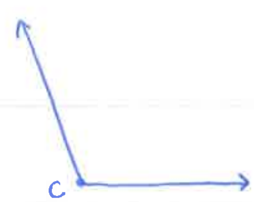
∠CBD or ∠DBC

∠ABD or ∠DBA

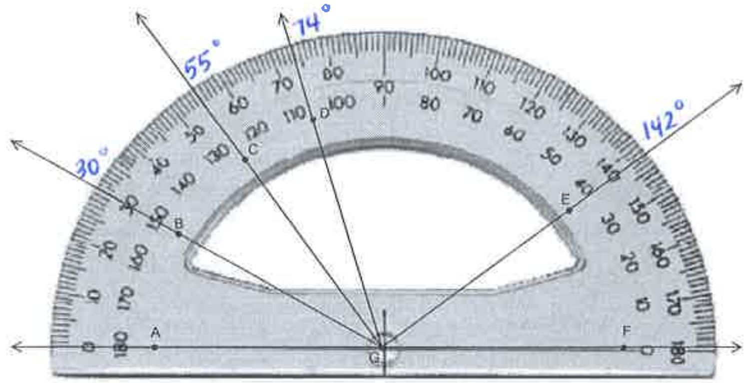


Example 2: Classifying and Measuring Angles

Angles can be classified as **acute, right, obtuse,** or **straight.**

 A	 B	 C	 D
Acute Angle	**Right Angle**	**Obtuse Angle**	**Straight Angle**
0° < m∠A < 90°	m∠B= 90°	90° < m∠C < 180°	m∠D= 180°

To measure an angle, we use a protractor to approximate its value using units called degrees.



Let's find the measure of some of the angles in the diagram above.

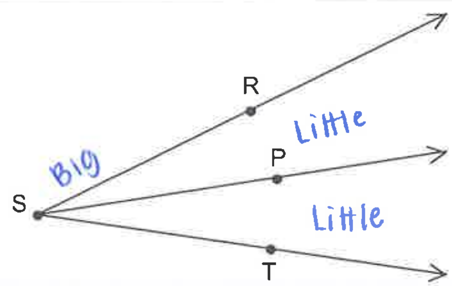
$m\angle AGB =$ 30° (30 - 0) $m\angle DGE =$ 68° (142 - 74) $m\angle CGD =$ 19° (74 - 55) $m\angle AGE =$ 142° (142 - 0)

↑ measure of angle AGB

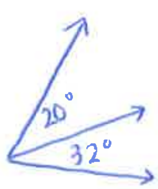
Example 3: Angle Addition Postulate

Angle Addition Postulate:

If P is in the interior of $\angle RST$, then
$m\angle$ RSP $+ m\angle$ PST $= m\angle$ RST.
little + little = big



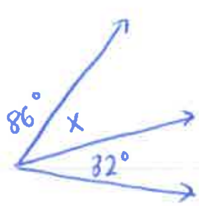
a. If $m\angle RSP = 20°$, and $m\angle PST = 32°$, find $m\angle RST$.



20 + 32 = m∠RST

$\boxed{52° = m\angle RST}$

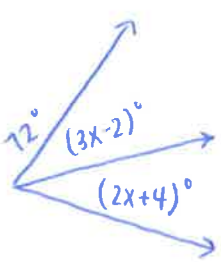
b. If $m\angle RST = 86°$, and $m\angle PST = 32°$, find $m\angle RSP$.



$x + \cancel{32} = 86$
$-\cancel{32} \quad -32$

$x = 54 \Rightarrow \boxed{m\angle RSP = 54°}$

c. If $m\angle RST = 72°$, $m\angle PST = (2x+4)°$, and $m\angle RSP = (3x-2)°$, find the value of x and the measures of the angles.



$3x - 2 + 2x + 4 = 72$

$5x + 2 = 72$

$5x = 70$

$\boxed{x = 14}$

$m\angle PST = 2(14) + 4$

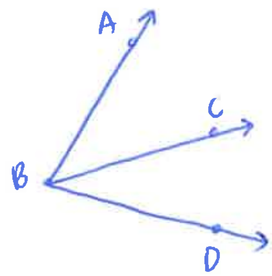
$\boxed{m\angle PST = 32°}$

$m\angle RSP = 3(14) - 2$

$\boxed{m\angle RSP = 40°}$

Example 4: Adjacent Angles

Adjacent angles are angles that have a common <u>vertex</u> and share a common <u>side</u> but no common interior points.

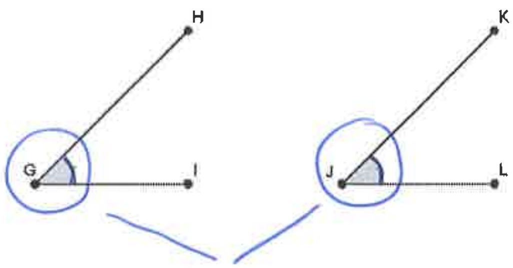


<ABC and <CBD are adjacent angles

- share vertex B
- share side $\overrightarrow{BC}$

Example 5: Congruent Angles

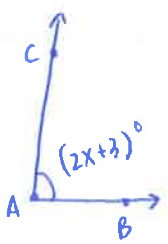
Congruent angles are angles that have the same measure.

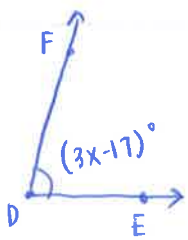


arcs mean congruent

Angle measures are equal.	Angles are congruent.
$m\angle HGI = m\angle KJL$	$\angle HGI \cong \angle KJL$
"is equal to"	"is congruent to"

a. If $\angle CAB \cong \angle FDE$, $m\angle CAB = (2x+3)^o$, and $m\angle FDE = (3x-17)^o$, solve for x and find the measure of each angle.





$2x+3 = 3x-17$

$3 = x-17$

$\boxed{20 = x}$

$m\angle CAB = 2(20)+3$

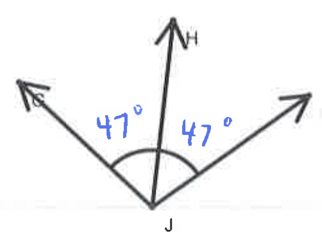
$\boxed{m\angle CAB = 43^\circ}$

$m\angle FDE = 3(20)-17$

$\boxed{m\angle FDE = 43^\circ}$

Example 6: Double Angle Measure

a. In the diagram, $\overrightarrow{JH}$ bisects $\angle IJG$, and suppose $m\angle GJH = 47^o$. Find $m\angle IJG$.



Since $m\angle GJH + m\angle HJI = m\angle GJI$

$47 + 47 = m\angle GJI \Rightarrow \boxed{m\angle GJI = 94^\circ}$

b. In the diagram, $\overrightarrow{JH}$ bisects $\angle IJG$, and suppose $m\angle GJI = 92°$. Find $m\angle HJI$.

$\frac{92}{2} = 46^\circ$

$\boxed{m\angle HJI = 46^\circ}$