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 __$\angle JKL$, $\angle LKJ$, $\angle K$__.
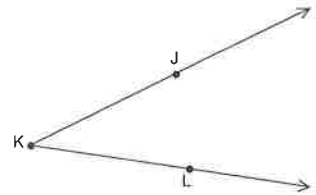
Example 1: Naming Angles

Name the three angles in the diagram below.

__$\angle ABC$__ or __$\angle CBA$__

__$\angle CBD$__ or __$\angle DBC$__
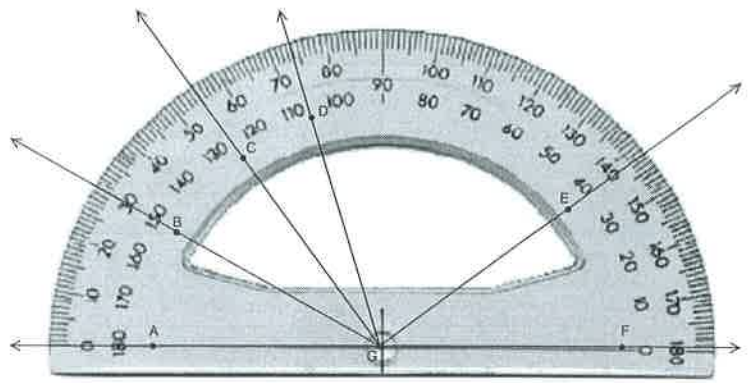
__$\angle ABD$__ or __$\angle DBA$__

Example 2: Classifying and Measuring Angles

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

Acute Angle	Right Angle	Obtuse Angle	Straight Angle
__$1°$__ < m∠A < __$89°$__	m∠B = __$90°$__	__$91°$__ < m∠C < __$179°$__	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°__ $m\angle DGE =$ __68°__ $m\angle CGD =$ __19°__ $m\angle AGE =$ __142°__

↓ acute; has to be less than 90°

142° − 74°

74° − 55°

↓ obtuse; has to be greater than 90°

Example 3: Angle Addition Postulate

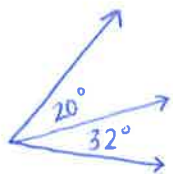<u>*Angle Addition Postulate*</u>:

If P is in the interior of $\angle RST$, then
$m\angle$ _RSP_ $+ m\angle$ _PST_ $= m\angle$ _RST_.
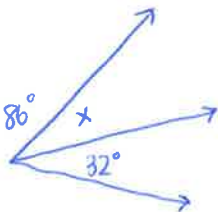
little + little = big

big

R   little

P

S   little

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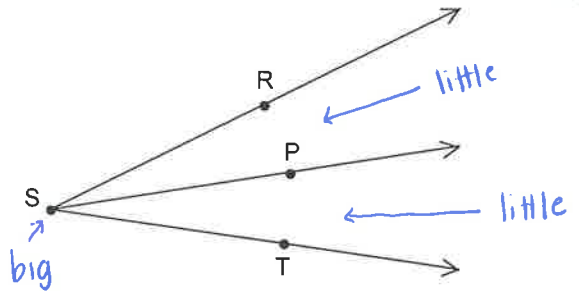
a. If $m\angle RSP = 20°$, and $m\angle PST = 32°$, find $m\angle RST$.

$20° + 32° = 52°$

$m\angle RST = 52°$

20°
32°

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

$x + 32° = 86°$

$x = 54$

$m\angle RSP = 54°$

86°
x
32°

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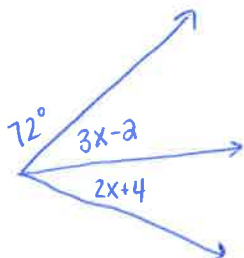
$3x - 2 + 2x + 4 = 72$

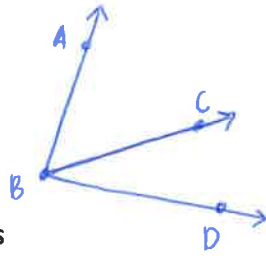$5x + 2 = 72$

$5x = 70$

$x = 14$

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

$m\angle PST = 32°$

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

$m\angle RSP = 40°$

72°
3x-2
2x+4

Example 4: Adjacent Angles
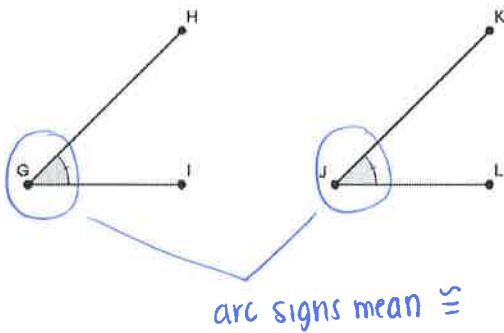
Adjacent angles are angles that have a common <u>Vertex</u> and share a common <u>Side</u> but no common interior points.

<ABC ; < CBD are adjacent with common side $\overrightarrow{BC}$

Example 5: Congruent Angles

Congruent angles are angles that have the same measure.

Angle measures are equal.

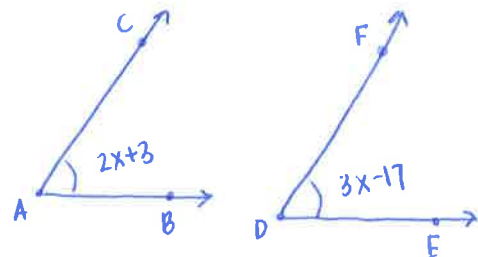$$m\angle G = m\angle J$$

"is equal to"

Angles are congruent.

$$\angle J \cong \angle G$$

"is congruent to"

arc signs mean $\cong$

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.

$2x+3 = 3x-17$ (If angles are $\cong$, their measures are $=$)

$3 = x - 17$

$\boxed{20 = x}$

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

$\boxed{m\angle CAB = 43^\circ}$
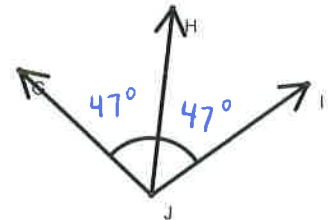
$m\angle FDE = 3(20)-17$

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

Example 6: Double Angle Measure

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

$m\angle IJG = 47+47$

$\boxed{m\angle IJG = 94^\circ}$

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

Divide 92 by 2 to get the 2 equal angles inside

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

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