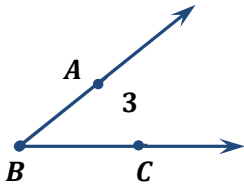


# Measuring Angles Guide Notes

An angle is a figure formed by two non collinear rays that have a common endpoint.

The common endpoint is called the vertex, and the two rays that make up the angle are called the sides of the angle.

There are several ways to name the angle.



Use the vertex and a point from each side.

$\angle CBA$  and  $\angle ABC$

Use the vertex only.

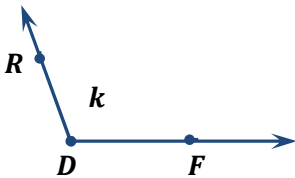
$\angle B$

Use a number.

$\angle 3$

Angles are measured in units called degrees. The symbol for degree is  $^\circ$ .

## Angles Measure Postulate

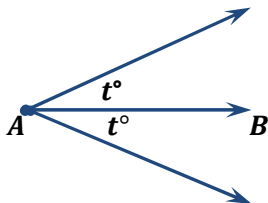


For every angle, there is a unique positive number between 0 and 180 called the degree measure of the angle.

$$m\angle FDR = k$$

$$0 < k < 180$$

Protractor Postulate -Describes the relationship between angle measures and numbers.



On a plane, given  $\overrightarrow{AB}$  and a number  $t$  between 0 and 180, there is exactly one ray with endpoint  $A$  extending on each side of  $\overrightarrow{AB}$  such that the degree measure of the angle formed is  $t$ .

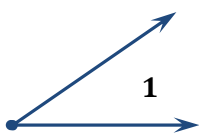
A protractor can be used to approximate the measure of an angle.

How to use the protractor:

1. Place the notch of the protractor at the vertex of the angle.
2. Place the edge of the protractor along a side of the angle so that the scale reads 0.
3. Read the angle size by reading the degree measure that corresponds to the second side of the angle.

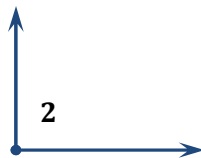
## Types of Angles

**Acute Angle**



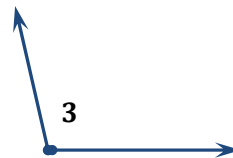
$$m\angle 1 < 90$$

**Right Angle**



$$m\angle 2 = 90$$

**Obtuse Angle**



$$180 > m\angle 3 > 90$$

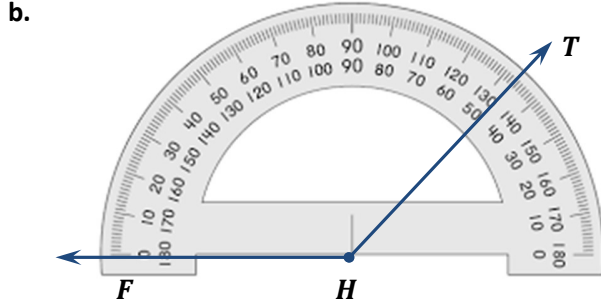
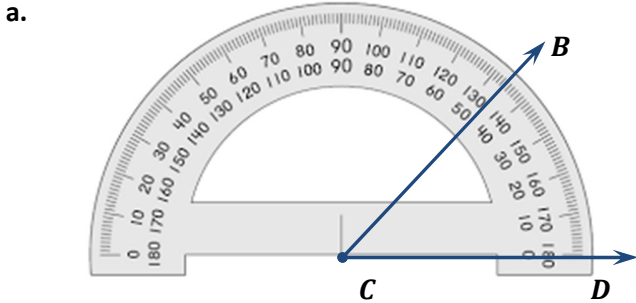
**Straight Angle**



$$m\angle 4 = 180$$

# Measuring Angles Guide Notes

**Sample Problem 1:** Find the measure of each angle. Then classify each angle.

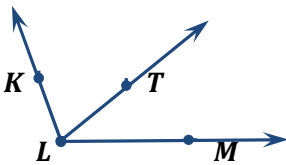


**Sample Problem 2:** Use a protractor to draw each angle. Then classify each angle.

a.  $m\angle COB = 15$

b.  $m\angle HTR = 150$

## Angle Addition Postulate

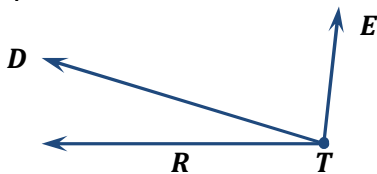


If  $T$  is in the interior of  $\angle KLM$ , then the measure of  $\angle KLM$  is equal to the sum of the measures of  $\angle MLT$  and  $\angle TLK$ .

$$m\angle KLM = m\angle MLT + m\angle TLK$$

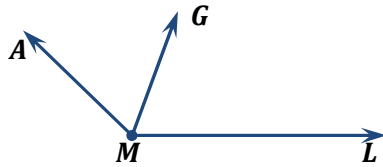
**Sample Problem 3:** Find the indicated angle measures.

a.  $m\angle RTD = 39$      $m\angle DTE = 56$   
 $m\angle RTE = ?$



## Measuring Angles Guide Notes

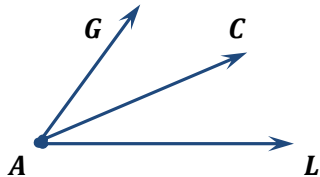
- b.  $m\angle LMA = 164$      $m\angle GMA = 56$   
 $m\angle LMG = ?$



**The bisector of an angle** is the ray with its endpoint at the vertex of the angle extending into the interior of the angle. The bisector separates the angle into two angles of equal measure.

**Sample Problem 4: Find the indicated angle measures.**

- a. If  $\overrightarrow{AC}$  bisects  $\angle LAG$  and  $m\angle LAG = 64$ , find  $m\angle LAC$  and  $m\angle CAG$ .



- b. If  $\overrightarrow{TG}$  bisects  $\angle PTD$  and  $m\angle PTG = 26$ , find  $m\angle PTD$  and  $m\angle GTD$ .

