

SECTION 1 - 3

Measuring Angles

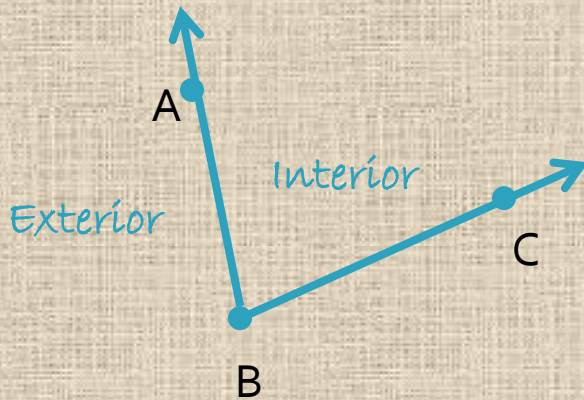
OBJECTIVES:



1. to name and classify angles
2. to measure angles and angle bisectors

ANGLE

An angle is formed by two rays with the same endpoint.



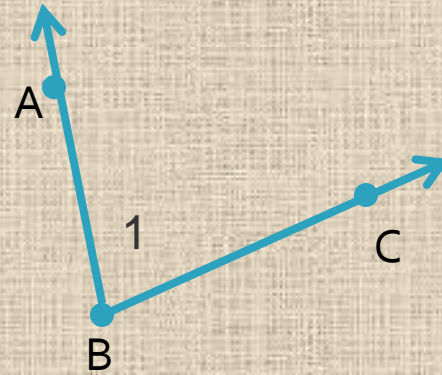
The rays are the sides of the angle. (\overrightarrow{BA} and \overrightarrow{BC}).

The endpoint is the vertex of the angle.

HOW TO NAME AN ANGLE:

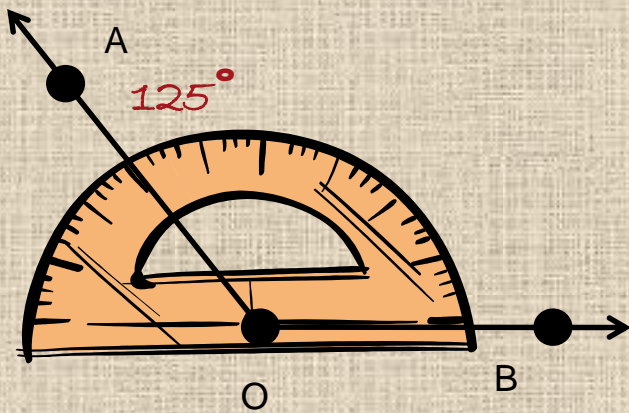
Named by:

1. Number inside: $\angle 1$
2. Vertex: $\angle B$
3. Point from one ray, vertex, point from other ray $\angle ABC$



PROTRACTOR POSTULATE

Every ray of an angle (like \overrightarrow{OA}) can be paired with a real number from 0 to 180 degrees.

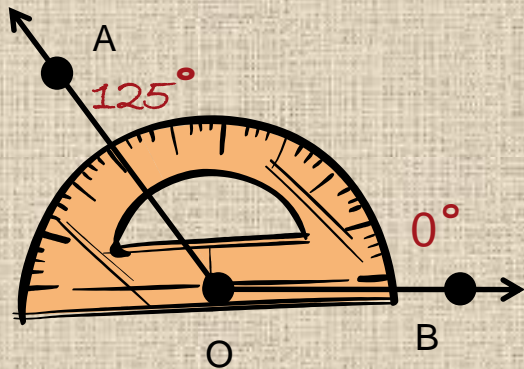


\overrightarrow{OA} is paired with the measurement 125°

MEASURE OF AN ANGLE

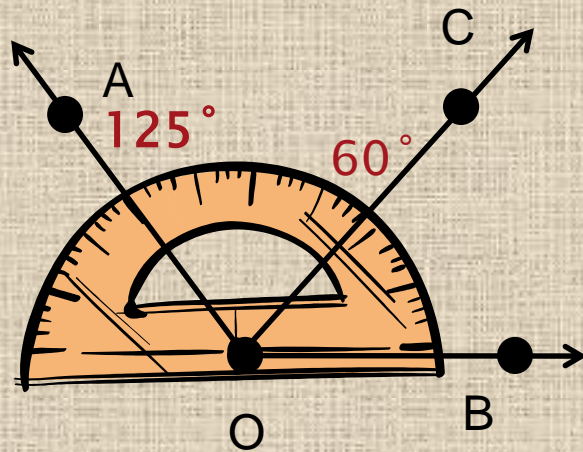
The absolute value of the difference of the real numbers paired with the rays of the angles.

When measuring with a protractor, the middle must be at the vertex and that one ray should be lined up with the side of the protractor at zero degrees.



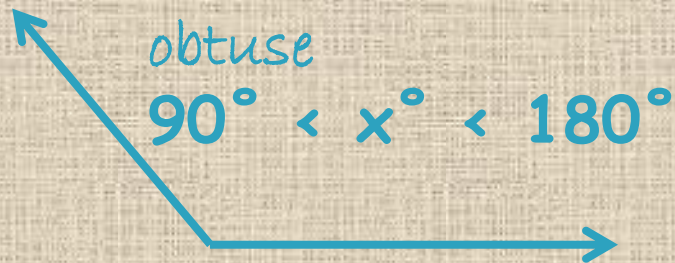
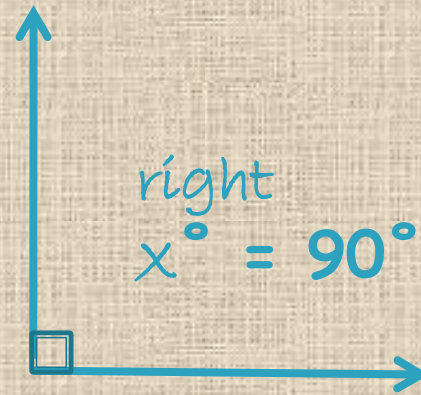
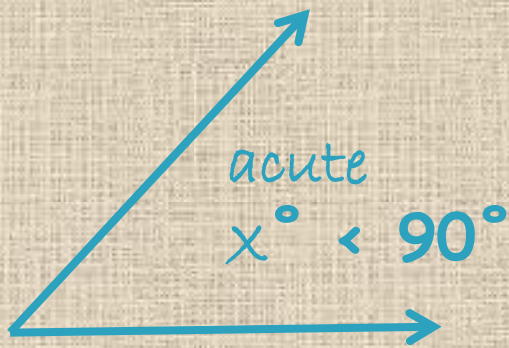
$$m\angle AOB = |125 - 0|$$
$$m\angle AOB = 125^\circ$$

PROTRACTOR POSTULATE EXAMPLE



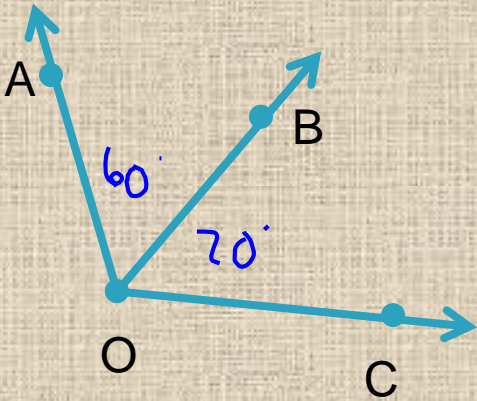
$$m\angle AOC = |125 - 60|$$
$$m\angle AOC = 65^\circ$$

Types of Angles:



ANGLE ADDITION POSTULATE

If Point B is in the interior of $\angle AOC$, then
 $m\angle AOB + m\angle BOC = m\angle AOC$.



Given:

$$m\angle AOB = 60^\circ$$

$$m\angle BOC = 70^\circ$$

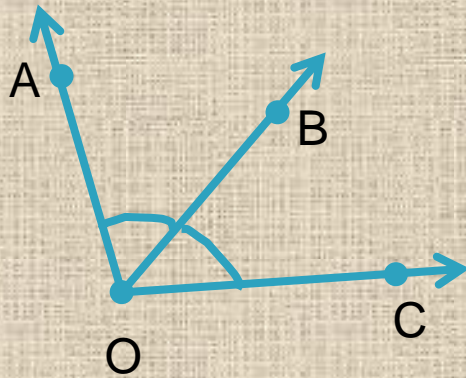
What is $m\angle AOC$?

$$m\angle AOC = 60 + 70$$

$$m\angle AOC = 130^\circ$$

CONGRUENT ANGLES

angles with the same measure



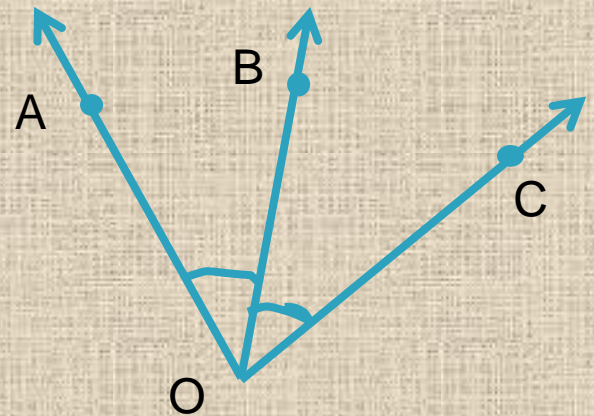
$$\angle AOB \cong \angle BOC$$

$$m\angle AOB = m\angle BOC$$

ANGLE BISECTOR

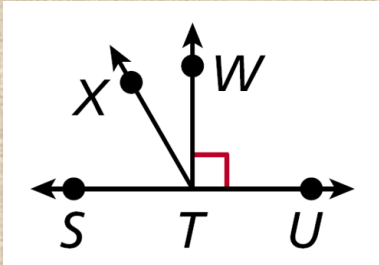
ray that divides an angle into two congruent angles.

\overrightarrow{OB} is the angle
bisector of
 $\angle AOC$.



PRACTICE PROBLEMS

Classify each angle as acute, right or obtuse.



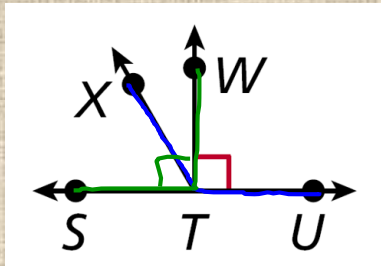
1. $\angle XTU$: _____

2. $\angle STW$: _____

3. Point K is in the interior of $\angle LMN$, $m\angle LMK = 52^\circ$, and $m\angle KMN = 12^\circ$. Find $m\angle LMN$.

PRACTICE PROBLEMS

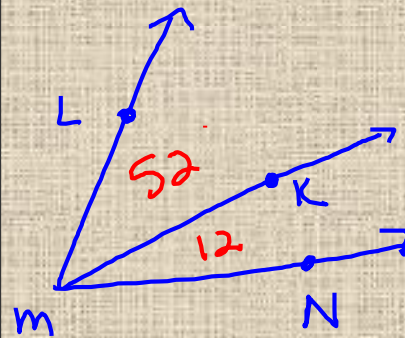
Classify each angle as acute, right or obtuse.



1. $m\angle XTU$: obtuse

2. $m\angle STW$: right

3. Point K is in the interior of $\angle LMN$, $m\angle LMK = 52^\circ$, and $m\angle KMN = 12^\circ$. Find $m\angle LMN$.

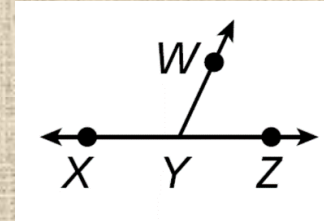


$$m\angle LMN = 52 + 12 = 64$$

PRACTICE PROBLEMS

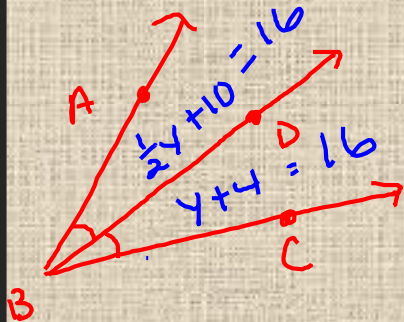
4. \overrightarrow{BD} bisects $\angle ABC$, $m\angle ABD = \left(\frac{1}{2}y + 10\right)^\circ$, $m\angle DBC = (y + 4)^\circ$. Find $m\angle ABC$.

5. $m\angle WYZ = (2x - 5)^\circ$, and $m\angle XYW = (3x + 10)^\circ$. Find the value of x .



PRACTICE PROBLEMS

4. \overrightarrow{BD} bisects $\angle ABC$, $m\angle ABD = \left(\frac{1}{2}y + 10\right)^\circ$, $m\angle DBC = (y + 4)^\circ$. Find $m\angle ABC$.



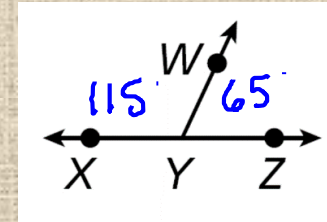
$$m\angle ABC = 32^\circ$$

$$\frac{1}{2}y + 10 = y + 4$$

$$y + 20 = 2y + 8$$

$$12 = y$$

5. $m\angle WYZ = (2x - 5)^\circ$, and $m\angle XYW = (3x + 10)^\circ$. Find the value of x .



$$2x - 5 + 3x + 10 = 180$$

$$5x + 5 = 180$$

$$5x = 175$$

$$x = 35$$

SUMMARY:

1. Angles are formed by two rays with the same endpoint.
2. Angles can be classified as acute, right, obtuse, or straight.
3. When an angle is split into pieces, the pieces can be summed to equal the original angle.
4. Congruent angles have equal measures.

LEARNING RUBRIC

- ▶ Got It: Represents and/or applies to complex/real world situations
- ▶ Almost There: Represent and/or apply angle addition/congruence with expressions
- ▶ Moving Forward: Represent and/or apply angle addition/congruence without expressions
- ▶ Getting Started: Names and classifies angles

HOMework

- ▶ Pages 25 – 27:
- ▶ 12 – 18 even;
- ▶ 30, 32, 42, 44, 50