1-4 Measuring Angles

Content Standard
G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

Objective To find and compare the measures of angles

Essential Understanding You can use number operations to find and compare the measures of angles.

take note

Key Concept Angle

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

The rays are the **sides** of the angle. The endpoint is the **vertex** of the angle.

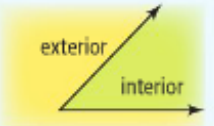
How to Name It
You can name an angle by
- its vertex, $\angle A$
- a point on each ray and the vertex, $\angle BAC$ or $\angle CAB$
- a number, $\angle 1$

Diagram

The sides of the angle are $\overrightarrow{AB}$ and $\overrightarrow{AC}$.
The vertex is A.

When you name angles using three points, the vertex must go in the middle.

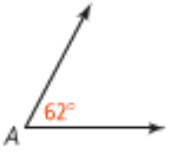
The *interior* of an angle is the region containing all of the points between the two sides of the angle. The *exterior* of an angle is the region containing all of the points outside of the angle.



Problem 1 Naming Angles

What are two other names for $\angle 1$?

$m\angle A = 62.^\circ$

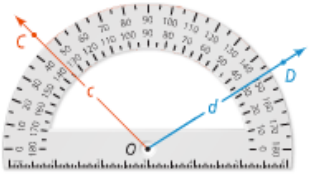


Take note

Postulate 1-7 Protractor Postulate

Consider $\overrightarrow{OB}$ and a point A on one side of $\overrightarrow{OB}$. Every ray of the form $\overrightarrow{OA}$ can be paired one to one with a real number from 0 to 180.

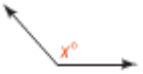
What is the difference between the angles on these two protractors?



You can classify angles according to their measures.

Take note

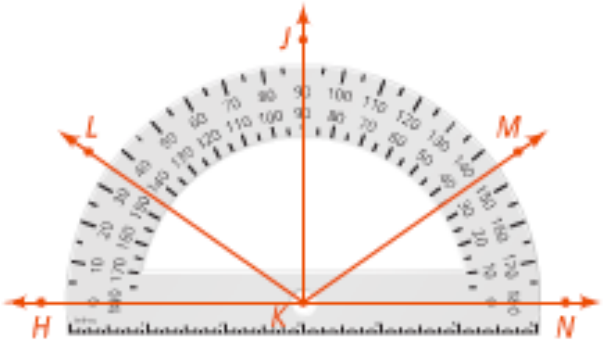
Key Concept Types of Angles

acute angle	right angle	obtuse angle	straight angle
			
$0 < x < 90$	$x = 90$	$90 < x < 180$	$x = 180$

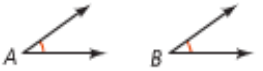
The symbol ⌝ in the diagram above indicates a right angle.

Problem 2 Measuring and Classifying Angles

What are the measures of $\angle LKN$, $\angle JKL$, and $\angle JKN$? Classify each angle as *acute*, *right*, *obtuse*, or *straight*.



Angles with the same measure are **congruent angles.** This means that if $m\angle A = m\angle B$, then $\angle A \cong \angle B$. You can also say that if $\angle A \cong \angle B$, then $m\angle A = m\angle B$.



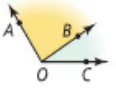
$m\angle A = m\angle B$
$\angle A \cong \angle B$

You can mark angles with arcs to show that they are congruent. If there is more than one set of congruent angles, each set is marked with the same number of arcs.

Take note

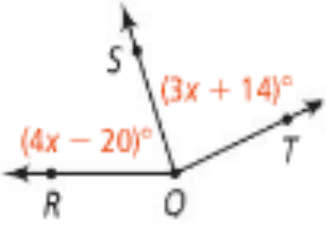
Postulate 1-8 Angle Addition Postulate

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



Problem 4 Using the Angle Addition Postulate

Algebra If $m\angle RQT = 155$, what are $m\angle RQS$ and $m\angle TQS$?

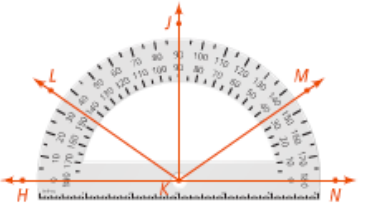


Lesson Review:

1. a. What are two other names for $\angle KML$?

b. Reasoning Would it be correct to name any of the angles $\angle M$? Explain.

2. What are the measures of $\angle LKH$, $\angle HKN$, and $\angle MKH$? Classify each angle as *acute*, *right*, *obtuse*, or *straight*.



4. $\angle DEF$ is a straight angle. What are $m\angle DEC$ and $m\angle CEF$?