

Measuring Angles

Unit 1 Lesson 4

Measuring Angles

Students will be able to:

- find and compare measures of angles

Key Vocabulary

angle

sides of an angle

vertex of an angle

measure of an angle

acute angle

right angle

obtuse angle

straight angle

congruent angle

Measuring Angles

take note

Key Concept Angle

Definition

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

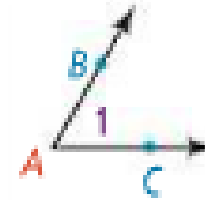
The rays are the **sides** of the angle. The endpoint is the **vertex** of the angle.

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

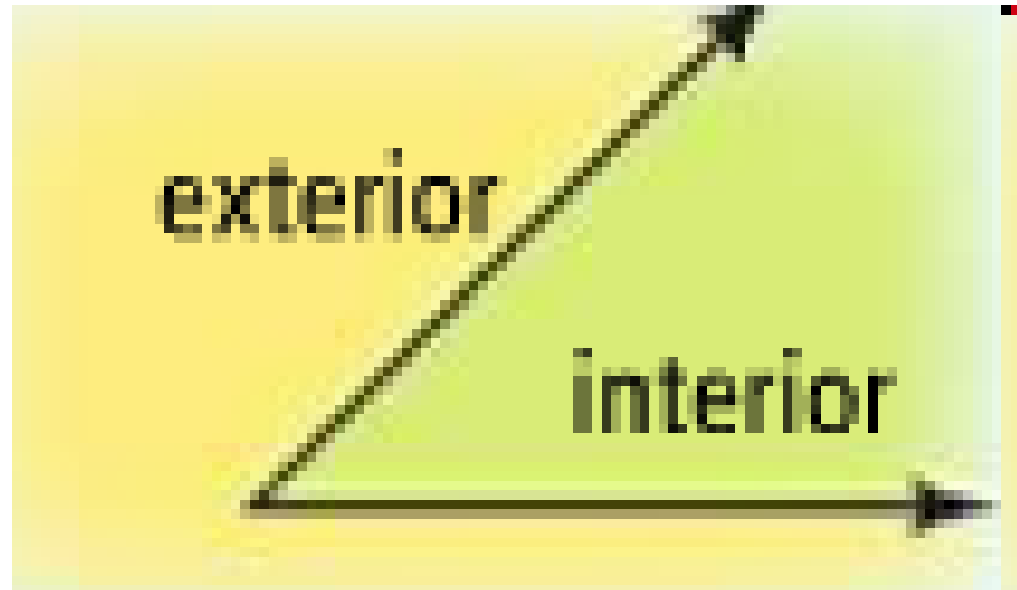


The sides of the angle are \overrightarrow{AB} and \overrightarrow{AC} .
The vertex is A .

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

Measuring Angles

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.

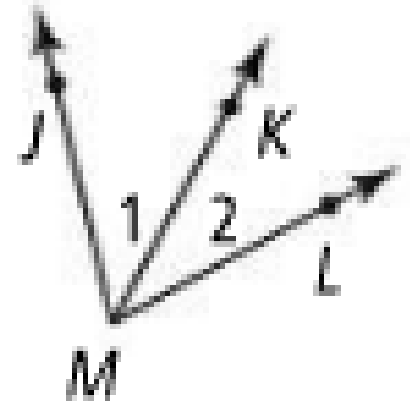


Measuring Angles

Problem 1:

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

What are the two other names for $\angle KML$?

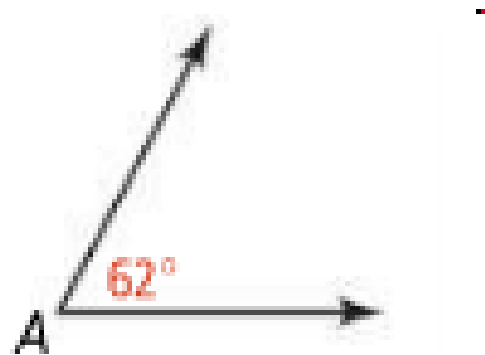


Would it be correct to name any of the angles $\angle M$?
Explain!!

Measuring Angles

One way to measure the size of an angle is in degrees. To indicate the measure of an angle, write a lowercase m in front of the angle symbol.

In the diagram, the measure of $\angle A$ is 62. You write this as $m\angle A = 62$.




Measuring Angles

The Protractor Postulate allows you to find the measure of an angle.

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.



Measuring Angles

The measure of $\angle COD$ is the *absolute value* of the *difference* of the real numbers paired with Ray OC and Ray OD.



Measuring Angles

Classifying Angles:

You tell me:

ACUTE

RIGHT

OBTUSE

STRAIGHT



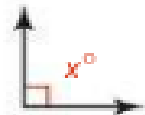
Key Concept Types of Angles

acute angle



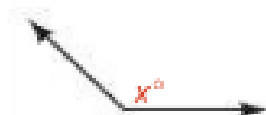
$$0 < x < 90$$

right angle



$$x = 90$$

obtuse angle



$$90 < x < 180$$

straight angle

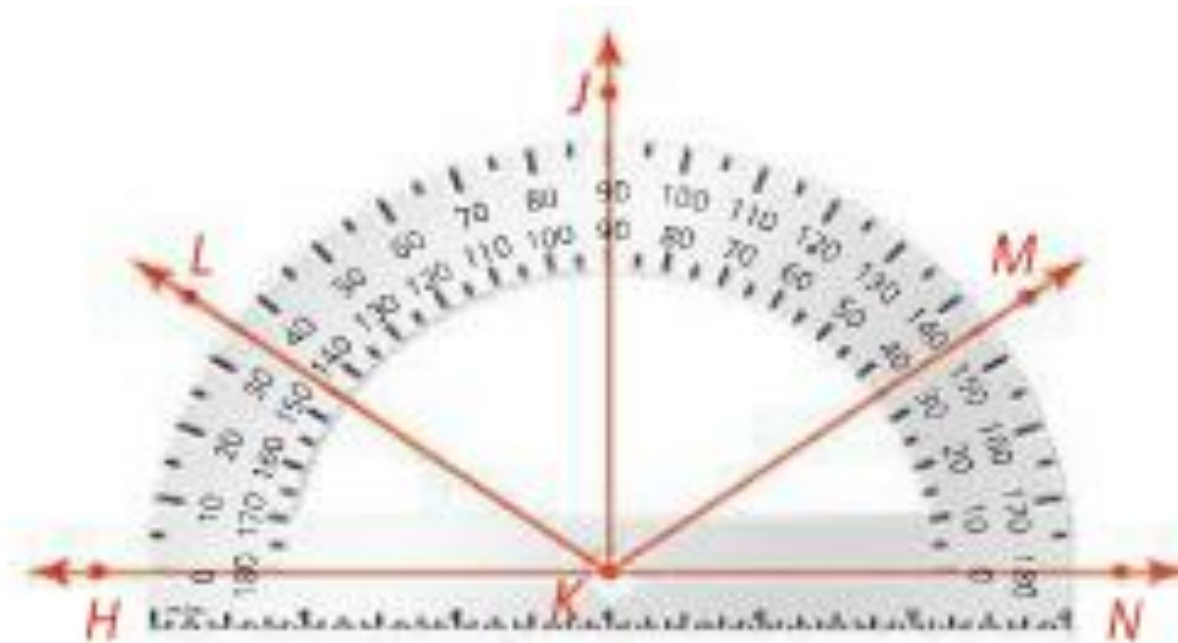


$$x = 180$$

Measuring Angles

Problem 2:

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

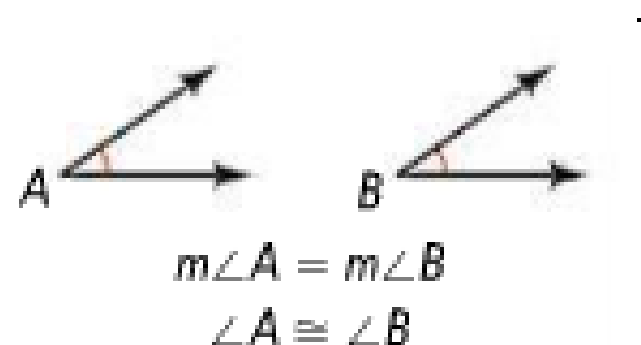


Measuring Angles

Angles with the same measure are congruent angles. This means that if

$$m\angle A = m\angle B,$$

then $\angle A \cong \angle B$.

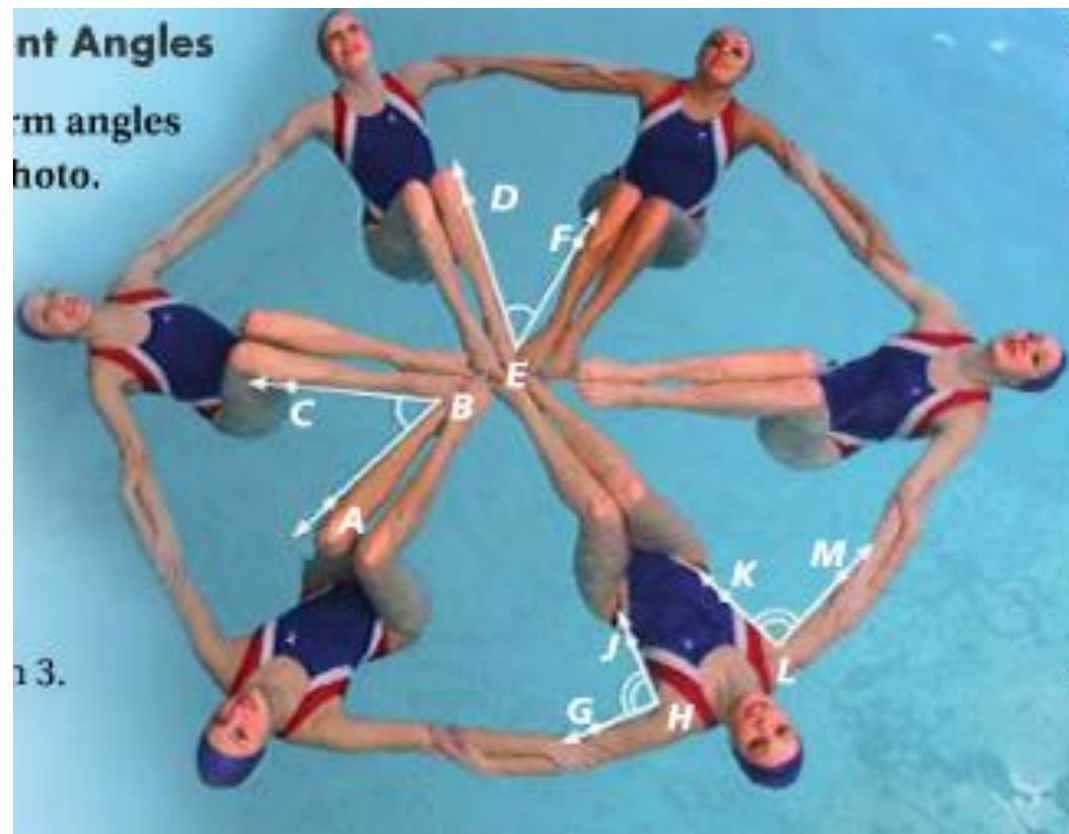


You can mark angles with arcs to show that they are congruent. If there is more than one set of congruent angles, each set is marked with the same number of arcs.

Measuring Angles

Problem 3:

Synchronized swimmers form angles with their bodies, as shown in the photo. If $m\angle GHJ = 90$, what is $m\angle KLM$?

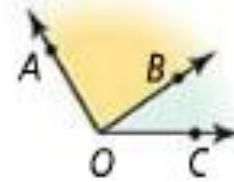


Measuring Angles



Postulate 1-8 Angle Addition Postulate

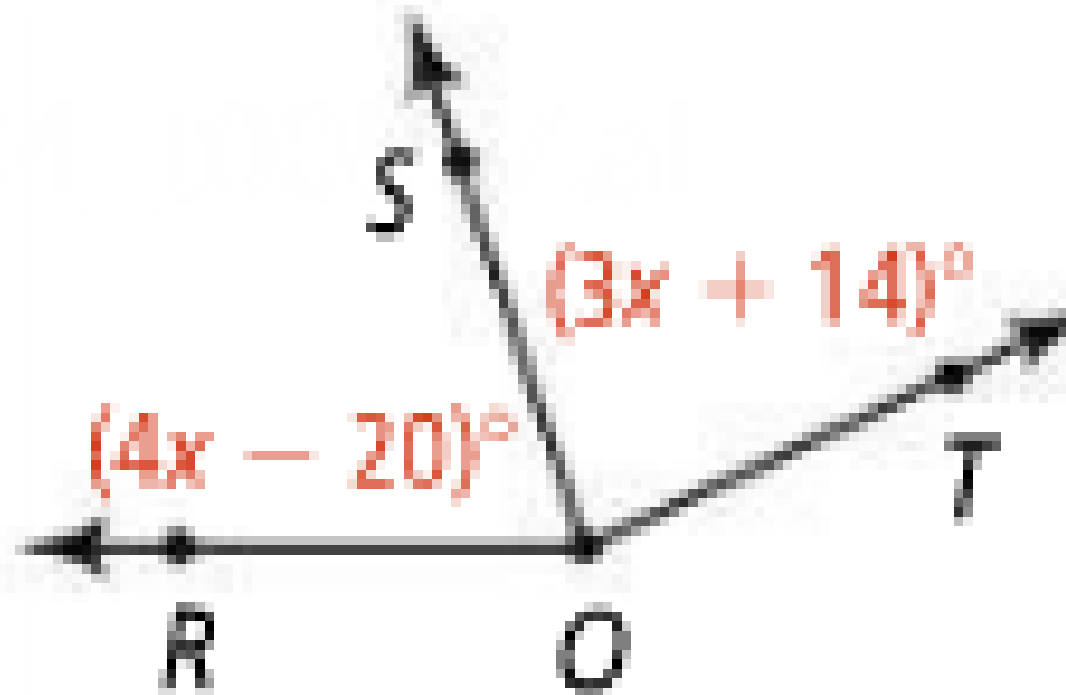
If point B is in the interior of $\angle AOC$,
then $m\angle AOB + m\angle BOC = m\angle AOC$.



Measuring Angles

Problem 4:

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



Measuring Angles

Problem 5:

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

