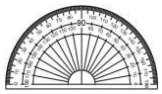
Name: _____ Date: _____

ANGLES AND THEIR MEASURES
N-GEN MATH® 8

It is important to understand various **geometric objects**. In the last lesson we saw **points**, **lines, rays**, and **segments**. Another important object is an **angle**.

***Exercise* #1:** Given points A, B, and C shown below do the following:

(a) Draw rays $\overrightarrow{CA}$ and $\overrightarrow{CB}$.

A •

(b) What point do the two rays in (a) share?

(c) An **angle** is defined as **two rays that share the same starting point**. Give three different ways of naming this angle you drew in (a).

C •

• B

(d) Use a protractor to find the degree measure of the angle you drew in (a).

(e) On the same diagram draw ∠CBA and find its measure.

Angles are classified by their size relative to quarter turns (or 90° rotations). See what you can remember in the next problem from previous years.

***Exercise* #2:** For each of the following fill in the blank with either acute, obtuse, right, or straight.

(a) an angle that has a measure less than 90° is called _____.

(b) an angle that has a measure of exactly 90° is called _____.

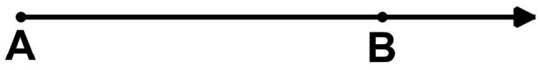
(c) an angle that has a measure between 90° and 180° is called _____.

(d) an angle that has a measure of exactly 180° is called _____.

We will need to be able to handle simple **algebra** as we work through geometry. Let's take a problem that combines angle knowledge with algebraic expressions.

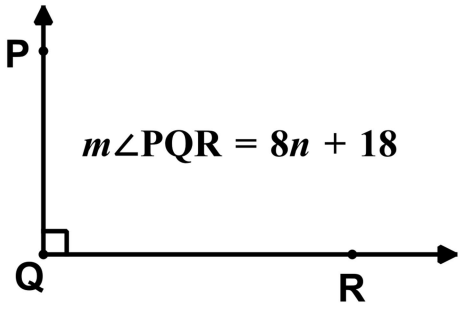
***Exercise* #3:** Points A, B, and C exist such that $m\angle CAB = 5x - 10$. Points A and B are plotted below. If $x = 25°$ do the following.

(a) Is $\angle CAB$ acute, obtuse, or right? Justify.



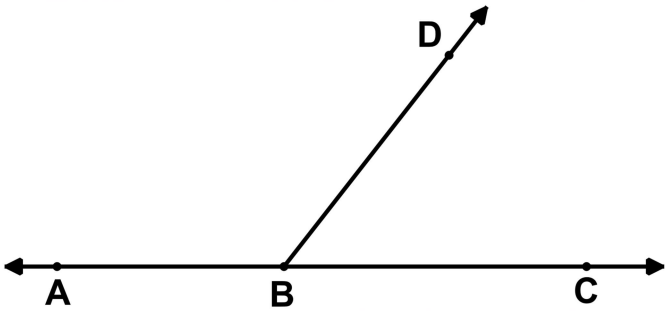
(b) Using a protractor, locate point C above $\overrightarrow{AB}$ such that it has the correct measure based on the value of *x*.

***Exercise* #4:** What is the value of *n* in the diagram shown? Find it algebraically.



Let's put all our knowledge together now in a complex combination of algebra and geometry.

***Exercise* #5:** In the diagram below point A, B, and C are collinear and ray $\overrightarrow{BD}$ has been drawn. It is known that $m\angle DBC = 3x + 10$ and $m\angle ABD = 10x - 12$. Find the value of *x*.



Name: _____ Date: _____

ANGLES AND THEIR MEASURES
N-GEN MATH® 8 HOMEWORK

FLUENCY

1. In each case three points are plotted. Draw the angle given. State whether the angle appears to be acute, obtuse, or right.

(a) ∠QRS

Type: _____

(b) ∠NMP

Type: _____

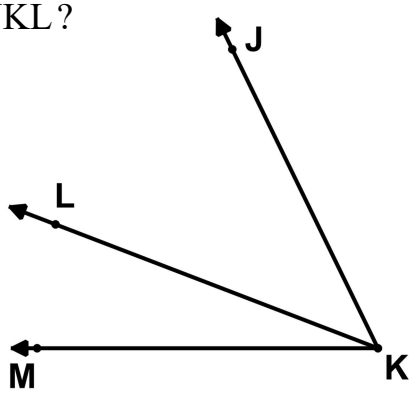
(c) ∠LMK

Type: _____

(d) ∠WYX

Type: _____

2. In the diagram shown, the measure of $\angle MKJ$ is $64°$ and the measure of $\angle MKL$ is $21°$. Which of the following is the measure of $\angle JKL$?



(1) $21°$

(2) $32°$

(3) $43°$

(4) $85°$

_____

3. If $m\angle H = 5d + 8$ and $d = 14°$ then which of the following is true about $\angle H$?

(1) it is acute

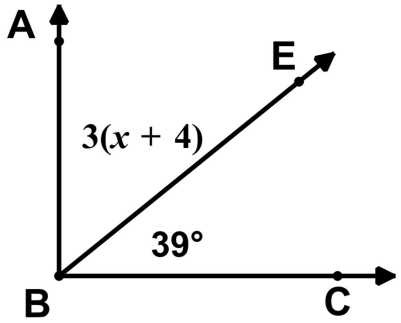
(2) it is obtuse

(3) it is right

(4) it is straight

_____

4. In the diagram shown, $\angle ABC$ is a right angle. If $m\angle EBC = 39°$ and $m\angle ABE = 3(x + 4)$, then find the value of x algebraically. Show how you found your answer.



REASONING

5. Ray $\overrightarrow{EF}$ is shown drawn below. Plot point G and draw ray $\overrightarrow{EG}$ so that the measure of $\angle GEF$ is $180°$. In other words, draw $\angle GEF$ as a straight angle.

A straight angle is the equivalent to what other type of geometric object?