Name: _____ (Remember: Edit, Preferences, Units, Tenths, Tenths, Check New Sketches)

Geometer's Sketchpad Project #1

- ✓ **Geometry Activity #1.1 – Introduction to Geometry**
- ✓ **Geometry Activity #1.2 – Angles**
- ✓ **Geometry Activity #1.3 – Angle Relationships**

Remember:

- ✓ After logging on and opening Geometer's Sketchpad, you need to click on "Edit," then click on "Preferences," then change to the precision to "Units-Tenths-Tenths," and then make sure you check "New Sketches."
- ✓ After completing a task, you should click on "File" and then "New Sketch."

Score: _____ out of 20 Points

Name: _____ (Remember: Edit, Preferences, Units, Tenths, Tenths, Check New Sketches)

Geometry Activity #1.1 – Introduction to Geometry

Geometry In geometry, a **point** is usually labeled with an uppercase letter, such as *A* or *B*. Points are used to name *lines*, *rays*, and *segments*.

Words	Diagram	Symbols
A **line** extends without end in two *opposite* directions.		$\overleftrightarrow{AB}$ or $\overleftrightarrow{BA}$
A **ray** has one **endpoint** and extends without end in *one* direction.		$\overrightarrow{AB}$
A **segment** has two endpoints.		$\overline{AB}$ or $\overline{BA}$

Task #1

Using Sketchpad, create and label a point, line, ray, and segment.

Task #2

Construct point K, $\overline{HJ}$, $\overrightarrow{MN}$, and $\overleftrightarrow{XY}$ in Sketchpad.

Check with Partner

Check with Teacher

Task #3

Go to http://www.mrhayden.com/, click on "Sketchpad Activities," and then click on "Introduction to Geometry."

Identify a point _____, a segment _____, a ray _____, and a line _____.

Task #4

Create a sketch that includes points, segments, rays, and lines that all intersect.

Task #5

Construct two segments, where one segment is exactly twice the length of the other.

Task #6

Construct a circle. Click on the point on the circle, not the center point. Click on "Display" and then "Hide Point." Draw a radius, which is a segment that connects the center point to part of the circle. Click on the point on the circle only, and then click on "Display" then "Animate Point." Make the point rotate slow, fast, clockwise, and counterclockwise.

Name: _____ (Remember: Edit, Preferences, Units, Tenths, Tenths, Check New Sketches)

Geometry Activity #1.2 – Angles

Task #1

Using Sketchpad, create two rays: $\overrightarrow{BA}$ and $\overrightarrow{BC}$. *NOTE: These two rays share a common endpoint.*

The shared endpoint is called the vertex (See Figure 1).

What did you create? _____

Make sure that you do not have anything selected.

Now click on point A, then point B, and finally point C.

Now click on "Measure" and then "Angle."

What is the measurement of your angle? _____

How did Sketchpad name your angle? _____

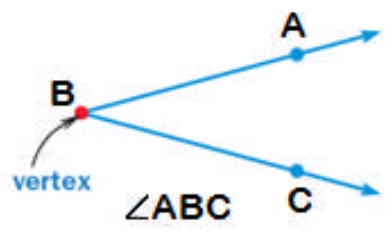


Figure 1 – Point B is the vertex of $\angle ABC$.

Play with $\angle ABC$ by moving point A or C. Create a 45° angle, then a 90° angle, and finally a 180° angle.

Task #2

Construct each type of angle, shown in Figure 2. Show each angle's measurement.

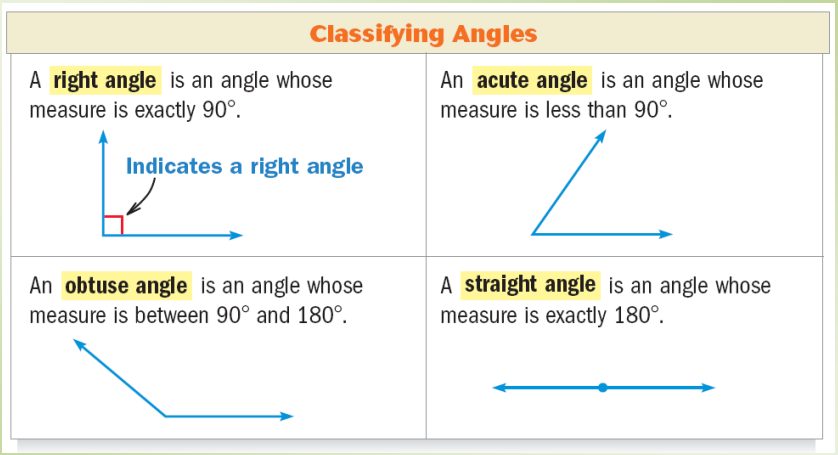


Figure 2 – Classifying Angles

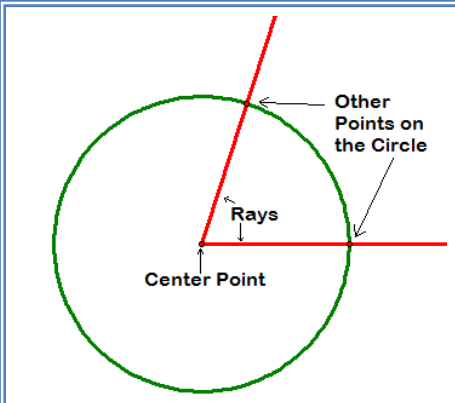


Figure 3 – Constructing two rays

Task #3

Construct a circle. Click on the point on the circle, not the center point of the circle. Now click on "Display" and then "Hide Point." Construct two rays where the end point is on the center of the circle and the other point is on the circle, see Figure 3.

Hide the circle by clicking on the circle and then click on "Display" and then "Hide Circle." Measure the angle that is created by the two rays. There should be exactly three points in your sketch. Click on one of the points, but make sure that it is not the center point. Click on "Display" and the "Animate Point."

Name: _____ (Remember: Edit, Preferences, Units, Tenths, Tenths, Check New Sketches)

Geometry Activity #1.3 – Angle Relationships

Task #1

Construct a circle. Construct two lines so that each line has one point as the center point of the circle and the other point is on the circle. Create points where the lines and circle intersects. (See Figure 1)

Find the measurement of $\angle 1, \angle 2, \angle 3, and\ \angle 4$. (See Figure 2)

Note: Angles with the same measure are congruent.

1. What is the relationship between $\angle 1\ and\ \angle 3$? _____
2. What is the relationship between $\angle 2\ and\ \angle 4$? _____
3. What is the relationship between $\angle 1$ and $\angle 2$? _____
   (Hint: Find their sum)

(To find the sum for #3, click on "Measure," then "Calculate," then click on one of the angle measures, click on the "+" sign, click on the other angle measure, and finally click on "OK"

What happens to the relationships mentioned in the three previous questions when you animate one of the points on the circle?

_____

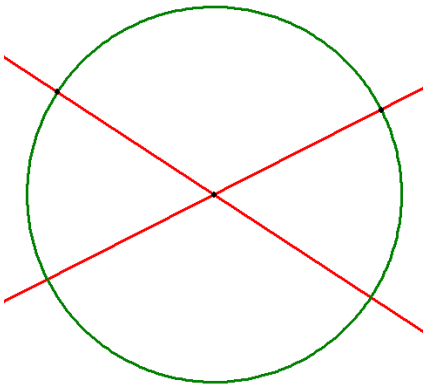


Figure 1 – Circle and Intersecting Lines

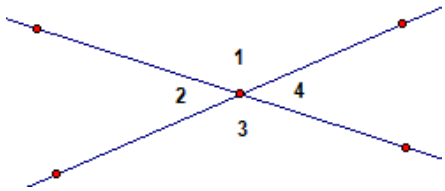


Figure 2 – Intersecting Lines
When two lines intersect, the angles opposite each other are called vertical angles.

Task #2

Construct a pair of complementary angles, supplementary angles, and a pair that is neither complementary nor supplementary.

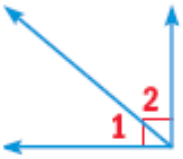
To show that two angles add up to 90° or 180°, click on "Measure," then "Calculate." Now click on an angle measure, then click on the addition sign, then click on the other angle measure, and finally click on "OK." The sum will now be shown on the sketch.

Complementary Supplementary Neither

Complementary and Supplementary Angles

Complementary angles Two angles are complementary if the sum of their measures is 90°.

$$m\angle 1 + m\angle 2 = 90°$$



Supplementary angles Two angles are supplementary if the sum of their measures is 180°.

$$m\angle 3 + m\angle 4 = 180°$$