Spaghetti Sine & Cosine Curves
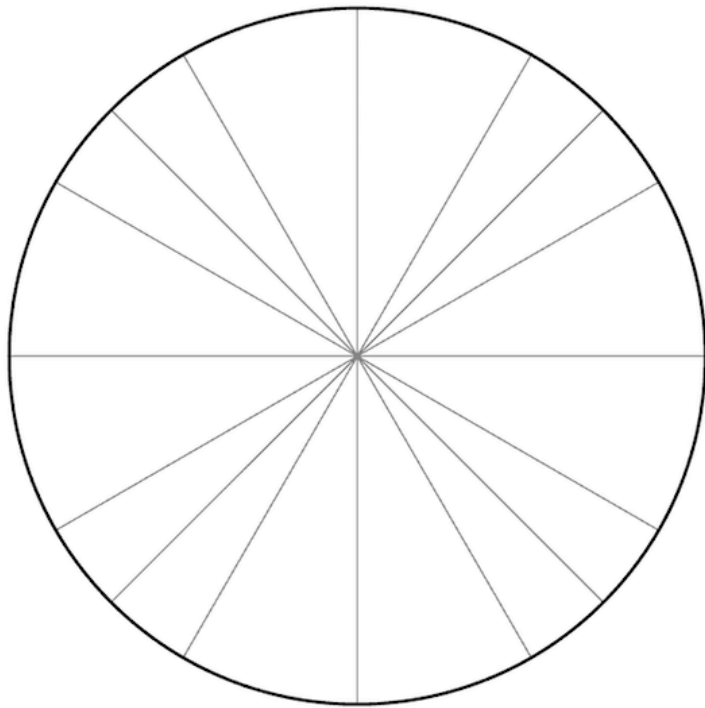
Name: Date: Period:

- Follow the instructions on the last page of this sheet. Use your string, spaghetti, and markers to create a sine and cosine curve .
- You may work with <u>one</u> other person for this project.
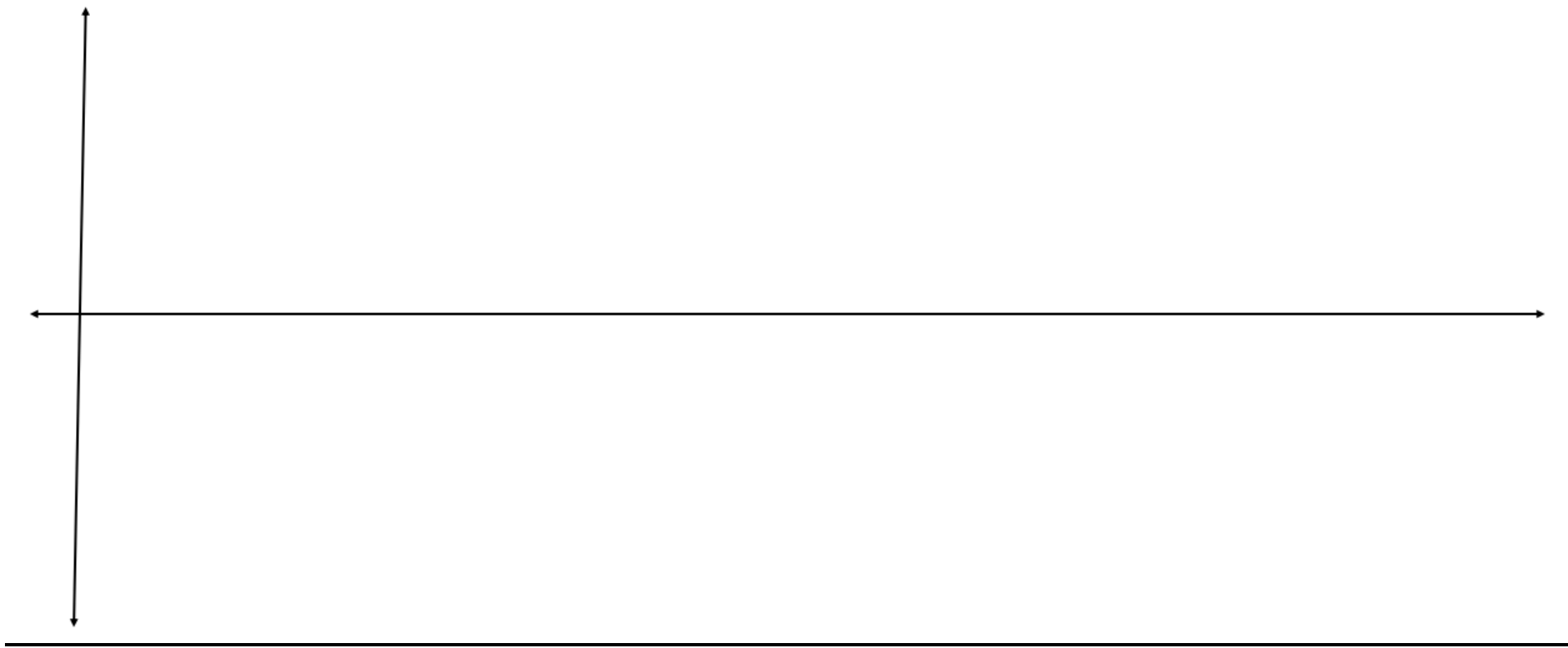- Earn an I for BM 2 and BM 3

Unit Circle

Graph of y=sin(x)

Graph of y=cos(x)

Instructions:

1. Label the unit circle with the appropriate radians
2. Carefully wrap the string around the circle bit by bit (**starting at 0 radians ending at 2π**), marking **on** the string as you go.
   - Make sure you mark each angle **on** the string as you go.

3. Lay the string taut (no slack) on the x-axis (below the circle) and transfer the string marks onto the x-axis. Make sure your original starting point is at the origin. Also, transfer the corresponding angle measurements.

4. Label your x-axis "**θ in radians**".

5. On the unit circle, use the spaghetti (ahem, *measuring tool*) to measure the radius (using an axis is smart), and transfer that length onto the y-axis below (both positive & negative). This will be 1 unit (write a "1" or "-1" accordingly on the y-axis). The circle is a "unit circle", a circle with r = 1.

6. You are now ready to graph y = sin θ. On the unit circle, use the spaghetti to measure the length of the side associated with your trig function (see warm up question #2), for each radian measurement marked out on the unit circle. Break the spaghetti to match this length.

7. Glue each piece of spaghetti to its corresponding mark on the x-axis, perpendicular to the x-axis.
   a. **NOTE**: if your triangle is in Q3 or Q4, then y is negative.

8. After you've finished with all of the angles, the ends of the spaghetti will form a curve that resembles a wave. Take your maker and trace the path of the spaghetti. The marker shows the graph of the sine curve

Next:
Using the same circle, the same tick marks, the same spaghetti, the graph on the next page, using the same technique (except now you're measuring the x length), **graph y = cos θ** and label it accordingly.

Notes: * when you are in Q2 & Q3, x is negative.