

Name:

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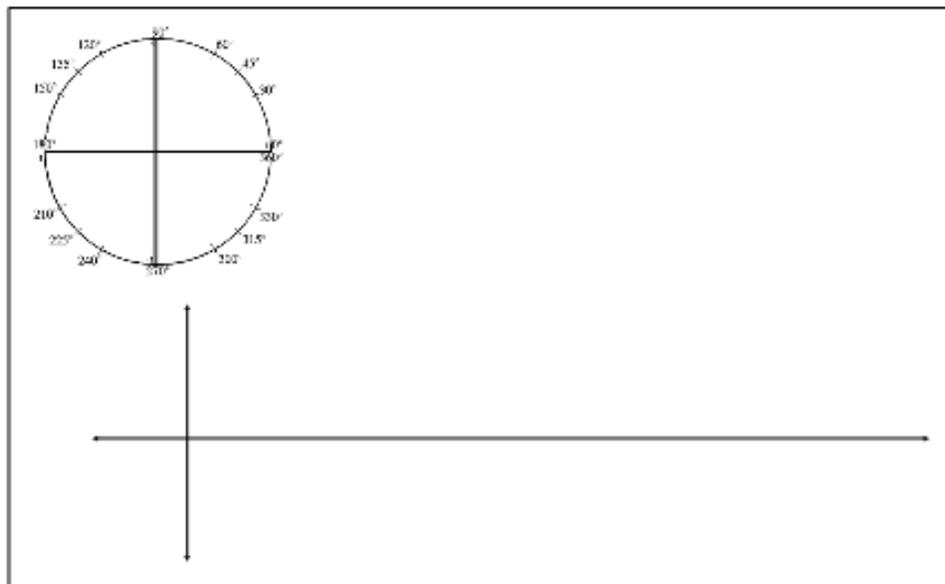
Hands-on Lab for Creating Trig Graphs from the Unit Circle

MATERIALS

- 2-11x17 paper
- string
- 4 wikisticks
- circle handout
- dried spaghetti
- Sharpie marker
- glue
- scissors
- ruler

DIRECTIONS

1. Cut out your circles along the border and glue one to the top left corner of your 11x17 inch paper.
2. Place your wikisticks around the circumference of the circle with one end at 0° and transfer the special angle marks onto the wikistick using the marker. (2 should be just enough!)
3. Adjacent to the circle, draw another set of axes with an x -axis that is the length of the circumference of the circle. Use the wikisticks to determine the circumference of the circle.
4. Push the wikistick down along the x -axis and mark off the angle increments. Label the axes in radians. Write the radian measures both above and below the axis. (You will know why in a minute!)



5. Using one piece of spaghetti, drop a perpendicular from 30° to the x -axis. Mark the length with your pencil and use the scissors to cut that length from the spaghetti.
6. Transfer the vertical piece of spaghetti to the x -axis below and glue it in its proper radian location.
7. Repeat this process for all of the angle marks around the circle. Connect the tips of the spaghetti bars with a long string to form the curve of the line on the graph.

1. What function is graphed? How do you know?
2. How did you know whether to place the strip above, or below, the x -axis prior to gluing?
3. What is the **period** of the sine curve? That is, after how many radians does the graph start to repeat? How do you know it repeats after this point?
4. What are the **zeroes** of this function? (Remember: The x -values are measuring angles and zeroes are the x -intercepts.)
5. What are the x -values at the **maxima** and **minima** of this function?
6. What are the y -values at the maxima and minima? To find the **amplitude** of the graph, subtract the minimum y -value from the maximum y -value and divide by 2. What is the amplitude of this graph?
7. What is the **domain** of this function?
8. What is the **range** of this function?

Constructing the TANGENT graph.

x	y = sin x	y = cos x	y = tan x Hint: $\tan x = \frac{\sin x}{\cos x}$
0			
$\frac{\pi}{4}$			
$\frac{\pi}{2}$			
$\frac{3\pi}{4}$			
π			
$\frac{5\pi}{4}$			
$\frac{3\pi}{2}$			
$\frac{7\pi}{4}$			
2π			

1. What will the graph look like where the tangent is undefined?

2. Sketch the graph of $y = \tan x$ over the interval $[0, 2\pi]$.

3. Identify the following for the graph of $y = \tan x$.

Domain:

Range:

Zeros:

