

Group Members _____

Sine Curves and Spaghetti Activity

MATERIALS NEEDED:

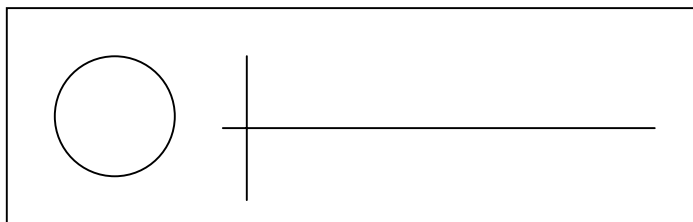
- 1 box of uncooked spaghetti
- Butcher Paper, approximately 2 feet wide, 8 feet long
- 1 Piece of string, approximately 6 feet long
- 1 Protractor
- 1 Meter Stick

THE SETUP:

1. Divide students into groups of three.
2. Give each group some spaghetti, a piece of butcher paper, string, compass and protractor.
3. The groups will need enough room to spread out the butcher paper on the floor or a large desk.

THE ACTIVITY:

1. On the left side of the paper, construct a circle that has a radius of the length of one spaghetti piece.
2. Draw an x-axis and y-axis through the center of the circle.
3. Using the protractor, mark every 15° on the circle.
4. To the right of the circle, draw another x and y-axis as shown below. The x-axis should be approximately 6.5 spaghetti lengths long.



(Note: Since the unit of measurement of the radius is one spaghetti, we have constructed a *unit circle*.)

5. Place the string along the circumference of the circle. Starting with 0° , mark every 15° from the circle to the string.
6. Put the string on the long x-axis and transfer the marks from the string to the axis. (The 0° mark should line up with the origin.)
7. Place a piece of spaghetti on the circle starting at the center going to the 15° mark. This is the radius, but it is now also the hypotenuse of a right triangle. To finish the triangle, place another piece of spaghetti at the 15° mark and drop it perpendicular to the x-axis. Break the spaghetti so that it is the correct length to fit between the 2 points.
8. Move the broken piece of spaghetti to the other x-axis and place it perpendicularly on the first mark (which corresponds to 15°).
9. Make a dot above the spaghetti piece to show the vertical length.
10. Repeat this process for each mark on the circle.
11. Don't forget to mark the distances for 0° , 90° , 180° and 270°