Pi In Everyday Objects
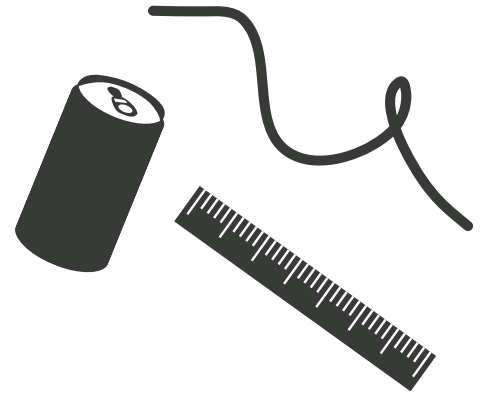## Measure, apply, and plot pi

Measure Objects

Use string to measure the ==circumference== (distance around) of 5 round objects (some large and some small). Lay the string next to a ruler to measure the circumference in centimeters.

Do the same for the ==diameter== (straight line from side to side through the center) of each object. Write the values in the table below.

	Circumference (cm)	Diameter (cm)	Ratio
Object #1			
Object #2			
Object #3			
Object #4			
Object #5			
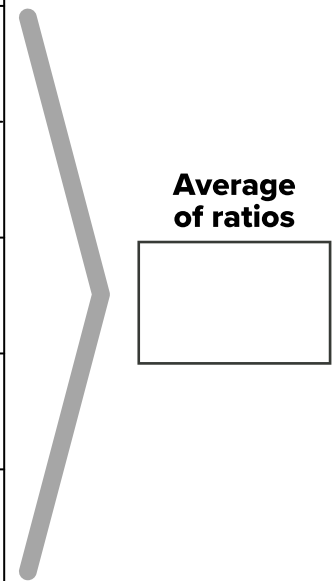
**Average of ratios**

Calculate Pi

Divide each circumference by its diameter to find the ==ratio== for each object. Find the average of these ratios.

To how many decimal places does this average accurately approximate the value of pi (3.14)?

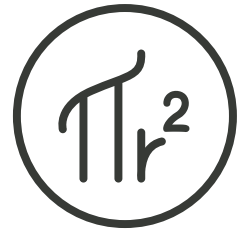How close did you come to the value of pi?

Calculate Area

Take the diameter measurements from the previous exercise to calculate the radius (distance from center to circumference, or, half the diameter). Then use pi (3.14) to calculate the area of your objects.

Area =

$$\pi r^2$$
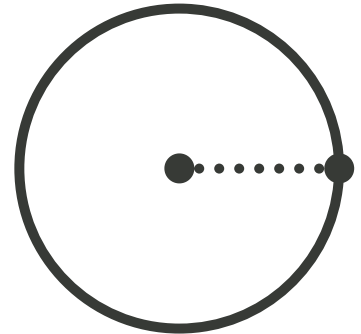
	Diameter (cm)	Radius (cm)	Area
Object #1			
Object #2			
Object #3			
Object #4			
Object #5			

Take A Pizza Break!

A store sells pizzas at the following rates. Which size pizza is the better deal? Explain your reasoning.

- Small (10″) = $5.99
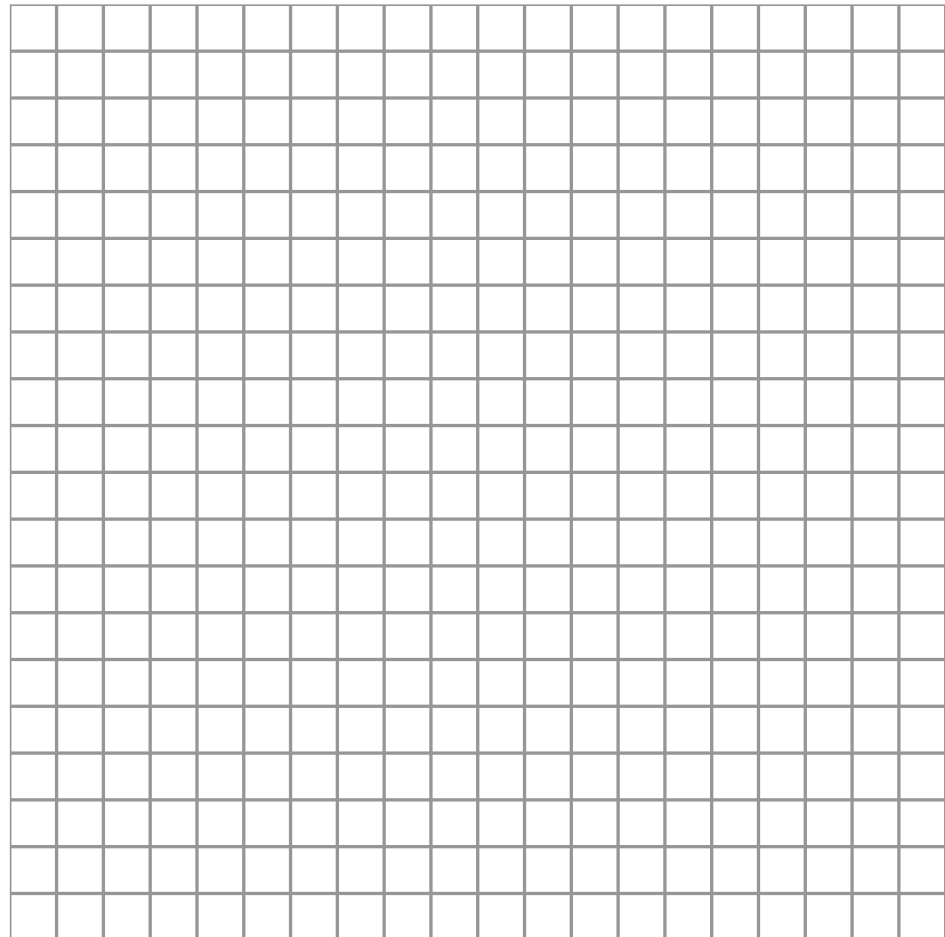- Medium (12″) = $7.99
- Large (14″) = $9.99

Plotting Pi

Complete the table using the diameter and circumference values from your 5 object measurements. Let x = diameter and y = circumference.

	Object #1	Object #2	Object #3	Object #4	Object #5
Diameter (x)					
Circumference (y)					

Plot the ordered pairs on a graph. Draw a line that best fits your data. What pattern do you notice?
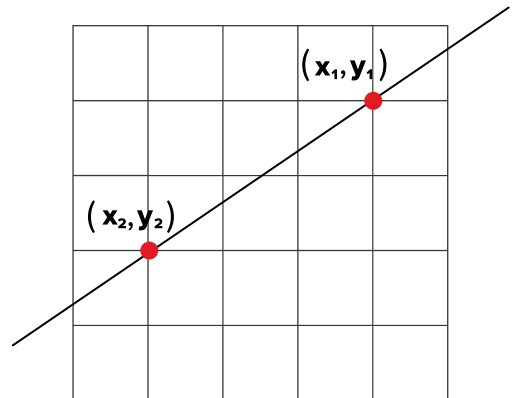
Circumference (y)

Diameter (x)

Calculating Slope

Divide the difference of the y-coordinates of 2 points on the line by the difference of the x-coordinates of those same 2 points. What is the slope of the line?

Slope

$$\boxed{} = \frac{\boxed{}^{\mathbf{y_2}} - \boxed{}^{\mathbf{y_1}}}{\boxed{}_{\mathbf{x_2}} - \boxed{}_{\mathbf{x_1}}}$$

(x_1, y_1)

(x_2, y_2)

Predicting Circumference

Write the equation for your line. Use the equation to predict the circumference of a circle with a diameter of 100 cm.

Calculate this same circumference using the formula $C = \pi d$. Compare your results.

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Answer Key

Plotting Pi

Question Plot the ordered pairs on a graph. Draw a line that best fits your data. What pattern do you notice?

Answer Linear relationship

Calculating Slope

Question Divide the difference of the y-coordinates of 2 points on the line by the difference of the x-coordinates of those same 2 points. What is the slope of the line?

Answer About 3.14 or pi

Predicting Circumference

Question Write the equation for your line. Use the equation to predict the circumference of a circle with a diameter of 100 cm.

Sample Answer $y = 3.21x$; Using this equation, I predict that a circle with a diameter of 100 cm would have a circumference of 3.21(100) or 321 cm.

Question Calculate this same circumference using the formula $C = \pi d$. Compare your results.

Sample Answer Using the formula, the circumference would be about 3.14(100) or 314 cm. 321 cm is close to but greater than the actual approximate circumference of 314 cm.