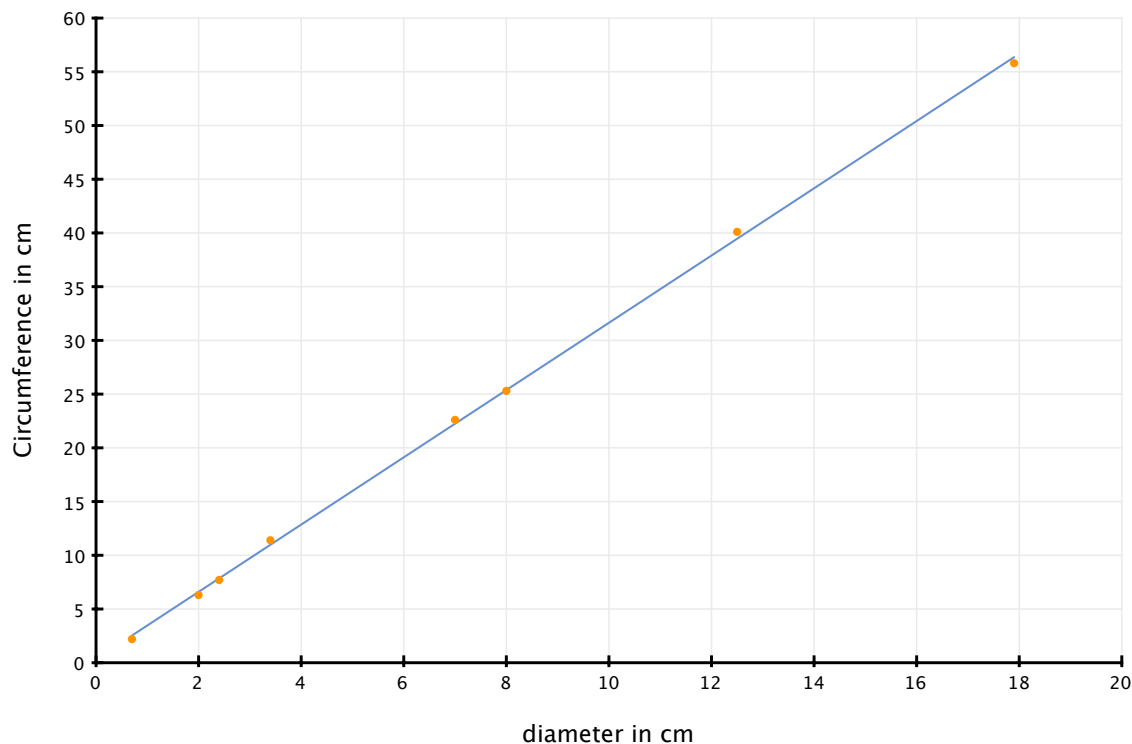


- Below is a table listing the circumference and diameter of several objects. Graph these values on the grid using the horizontal axis for diameter and the vertical axis for circumference.

Object	Circumference	Diameter
CD case	40.1 cm	12.5 cm
Coffee mug	25.3 cm	8.0 cm
Salad plate	55.8 cm	17.9 cm
Pencil top	2.2 cm	0.7 cm
Penny	6.3 cm	2.0 cm
Quarter	7.7 cm	2.4 cm
Lotion bottle	11.4 cm	3.4 cm
Water bottle	22.6 cm	7.0 cm



Describe your graph. What does your graph tell you about the relationship between circumference and diameter?

The points on the graph look like they form a straight line. The slope of the line is a little more than three. That tells us that the circumference of a circle is a little more than three diameters. If measurements could be made without error, the line would have a slope equal to π .

2. Mr. Garcia gave the following problem to students in his math class.

A decorative fountain pool at school has a diameter of 28 feet. What is the approximate circumference of the pool? What is the approximate area?

Mr. Garcia's students gave the following answers. Explain whether or not the answers are reasonable estimates.

Student A: $C \approx 90$ ft. $A \approx 2700$ sq. ft.

This answer for the circumference is reasonable. The formula of circumference is $C = \pi d$. The diameter is close to 30 and π is close to three, so the circumference is close to 3×30 , or 90 ft. The answer for the area is not reasonable. ($A = \pi r^2$) It appears that the student squared 30, the approximate diameter ($30^2 \times 3$), instead of the radius ($14^2 \times 3$).

Student B: $C \approx 84$ ft. $A \approx 600$ sq. ft.

This answer for circumference is reasonable. The formula for circumference is $C = \pi d$. The diameter is 28 feet and π is close to three, so the circumference is close to 3×28 , or 84 ft. This answer for area is also reasonable. ($A = \pi r^2$) The radius is half the diameter or 14 ft. The radius squared is 196 or about 200 ($200 \times 3 = 600$ sq. ft.).

Student C: $C \approx 150$ ft. $A \approx 600$ ft.

This answer for circumference is not reasonable. The formula for circumference is $C = \pi d$. It appears that this student doubled the diameter (about 50) and then multiplied by 3 to get 150. This answer for area is not reasonable because the label is incorrect. The area is approximately 600 sq. ft. rather than 600 ft. You cannot measure area with a linear unit.

Student D: $C = 87.92$ ft. $A = 615.44$ sq. ft.

The student should indicate that both answers are approximations rather than exact answers. Since π is an irrational number, any measurement found by substituting 3.14 for π is an approximation ($C \approx 28 \times 3.14$ and $A \approx 14^2 \times 3.14$).