

Squares and Circles

This problem gives you the chance to:

- work with perimeter and circumference of squares and circles
- use and interpret line graphs and their equations

The points on this graph show the perimeters of squares of different sizes.

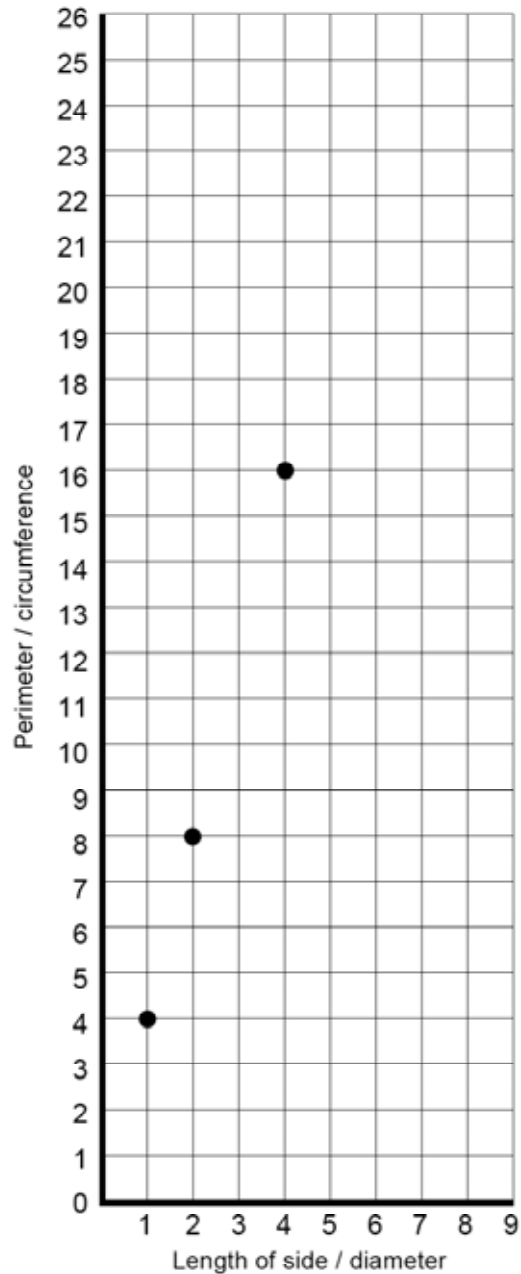
For example, a square with sides 2 inches long has a perimeter of 8 inches.

1. What is the perimeter of a square with sides 5 inches long?

Mark a point for this square on the graph.

2. How long are the sides of a square with perimeter 12 inches?

Mark a point for this square on the graph.



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3. Draw a line through the points on the graph.

(a) Explain why the line passes through the point (0, 0).

(b) Explain why the line is straight.

4. Draw a circle around the correct equation of the straight line on the graph.

$$x + y = 4 \quad y = x + 4 \quad y = 4x \quad y = \frac{x}{4}$$

This table shows the circumferences of circles with different diameters.
The circumferences have been rounded to one decimal place.

Diameter of circle in inches	1	2	3	4	5	6
Circumference in inches	3.1	6.3	9.4	12.6	15.7	18.8

5. For each circle, mark an (X) on the graph to show its diameter and circumference.
Join the Xs with a straight line.

6. Write down one thing that is the same and one thing that is different about the line for the squares and the line for the circles.

Same:

Different:

9

Squares and Circles	Rubric	
<p>The core elements of performance required by this task are:</p> <ul style="list-style-type: none"> • work with perimeter and circumference of squares and circles • use and interpret line graphs and their equations <p>Based on these, credit for specific aspects of performance should be assigned as follows</p>	points	section points
1. Gives correct answer: 20 (inches) and correct point marked on graph.	1	1
2. Gives correct answer: 3 (inches) and correct point marked on graph.	1	1
<p>3. Correct line drawn.</p> <p>(a) Gives correct explanation such as: The perimeter is zero if the side length is zero.</p> <p>(b) Gives correct explanation such as: The perimeter is always four times side length. or The perimeter is proportional to side length.</p>	1 1 1	3
4. Gives correct answer: $y = 4x$	1	1
5. Correct points marked and line drawn.	1	1
<p>6. Writes correct statements such as:</p> <p>Both lines go through (0,0)</p> <p>The line for the squares is steeper than the line for the circles.</p>	1 1	2
Total Points		9