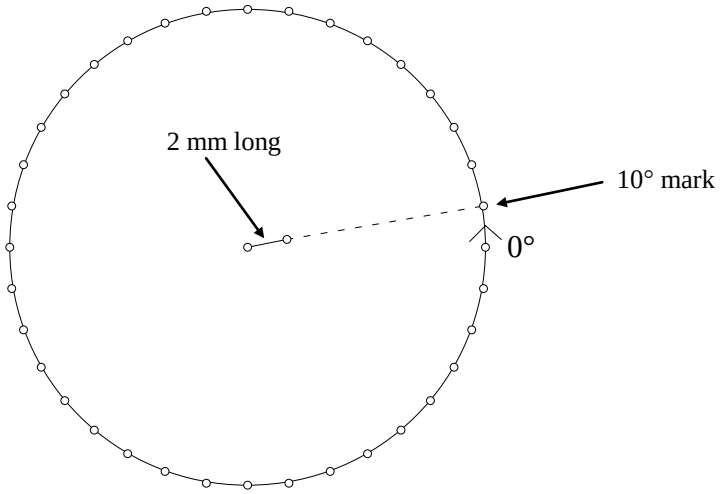
A POLAR GRAPH

Polar graphs are based on a circular co-ordinate system, rather than just a rectangular grid with *x* and *y* axes. Geo-Pro's protractor, with its 10° intervals, is ideal for plotting polar graphs. See if you can reproduce an interesting polar graph by following the instructions below.

1. Construct a large circle by drawing two semi–circles using Geo–Pro's protractor.

   Mark points at 10° intervals around the circumference of the circle.
   Mark a 0° point at the 'East' (E) mark. Also mark the centre of the circle.

2. Place a ruler with its zero mark on the centre of the circle and line up the first angle mark past 0° (i.e. the 10° mark). Rule a line of length 2 mm from the centre toward the 10° mark.



3. Now rule a line of length 4 mm from the centre towards the 20° mark.

4. Next, rule a 6 mm line from the centre towards the 30° mark.

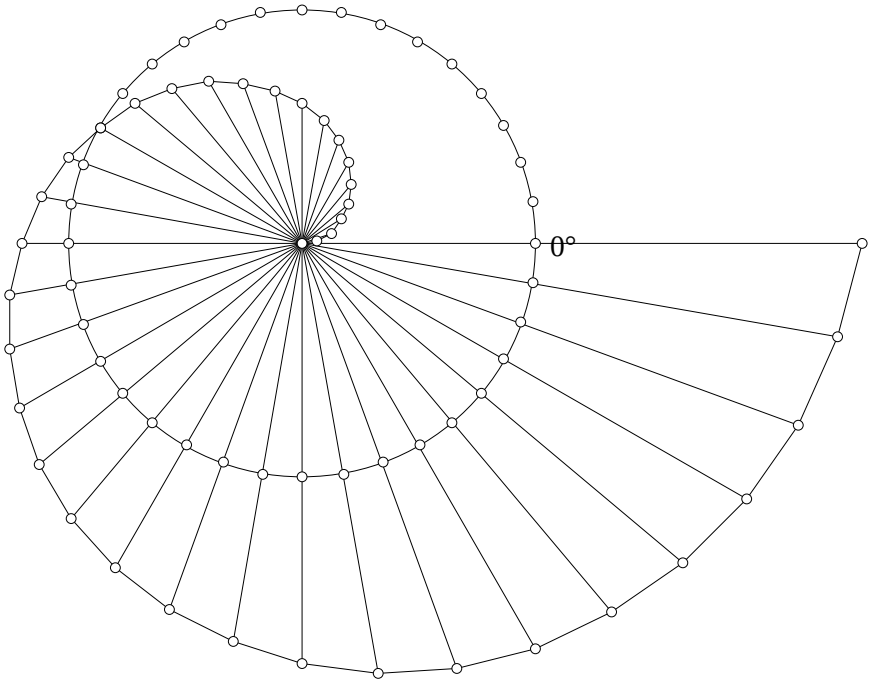
5. Continue, adding 2 mm in length for each new angle, until you have gone around the entire circle.

6. Join the ends of each line to complete the polar graph.

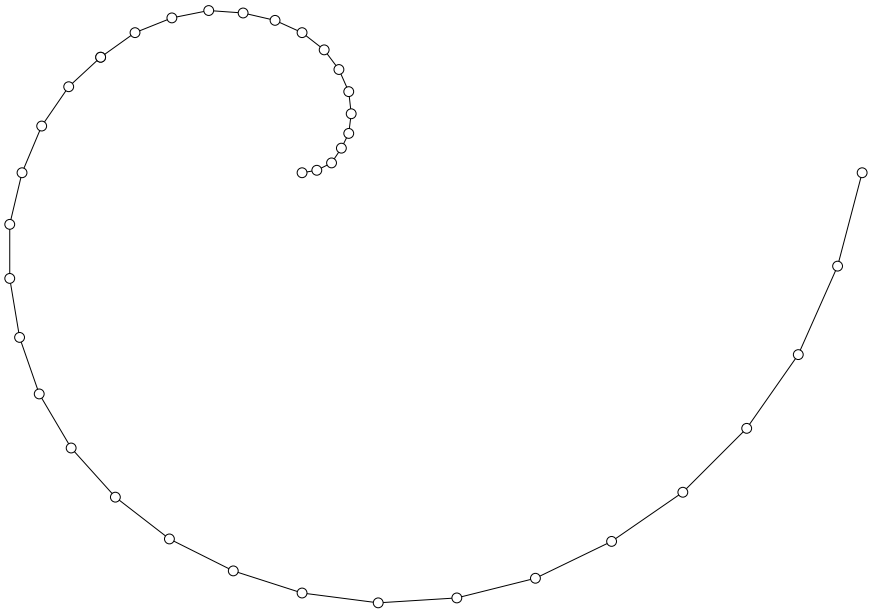
Your teacher may explain the rules for some other polar graphs.

Answers

A POLAR GRAPH



The polar equation for this curve (which is an example of a 'Spiral of Archimedes') is $r = \frac{1}{5}\theta$, where r is measured in millimetres, and θ in degrees.



A Spiral of Archimedes without the radii or circle marked.