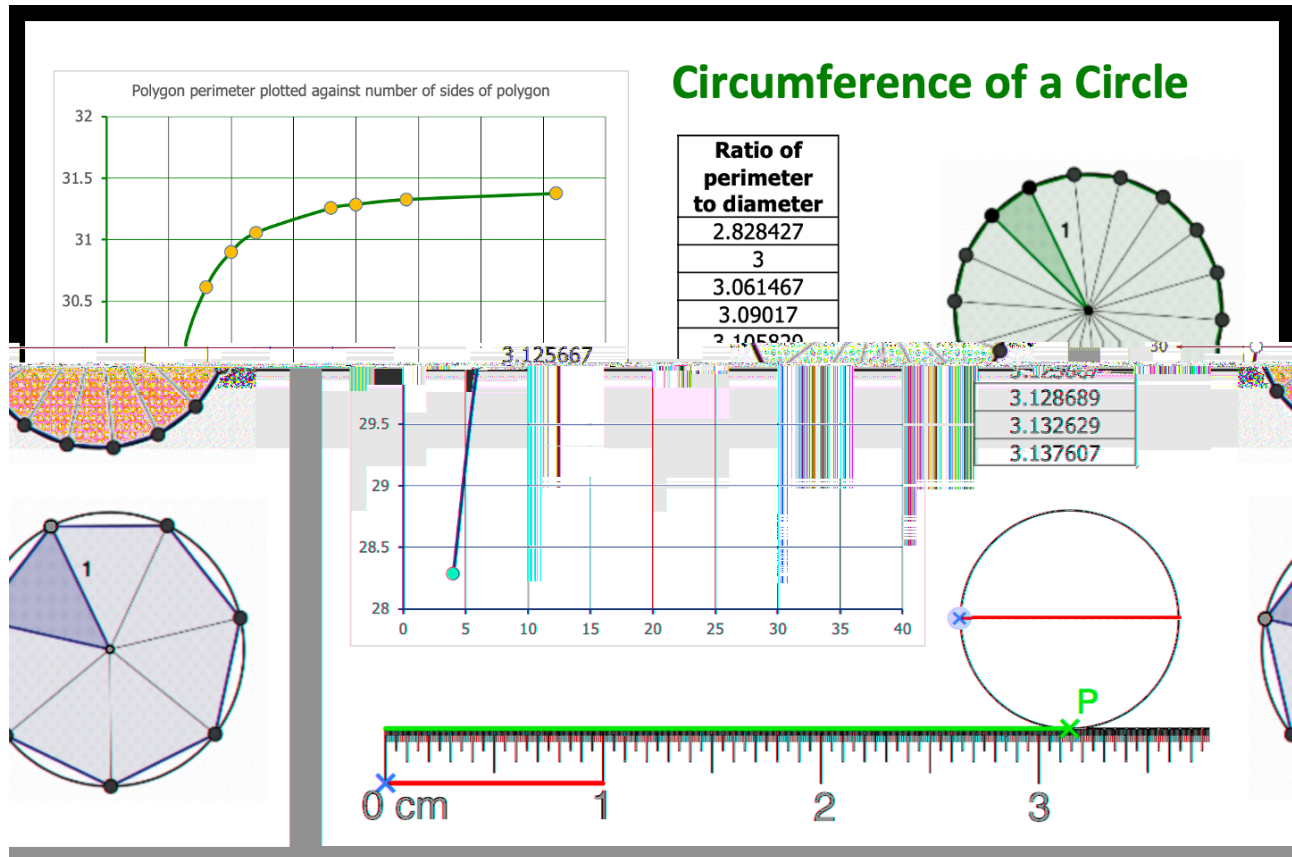


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Circles: Circumference Work (Answers at End)



PowerPoint, ActivInspire and Excel files and gifs for this at:

<https://spiremaths.co.uk/circlecircumference/>

You should do this in groups: use 9 x 10cm diameter circles from pages 3, 4 and 5.

- 1 Count number of spokes of the circle
- 2 Measure diameter of circle
- 3 Draw straight line between ends of one pair of adjacent spokes
- 4 Measure length of this line
- 5 Calculate total perimeter around polygon if you joined all the ends of adjacent spokes

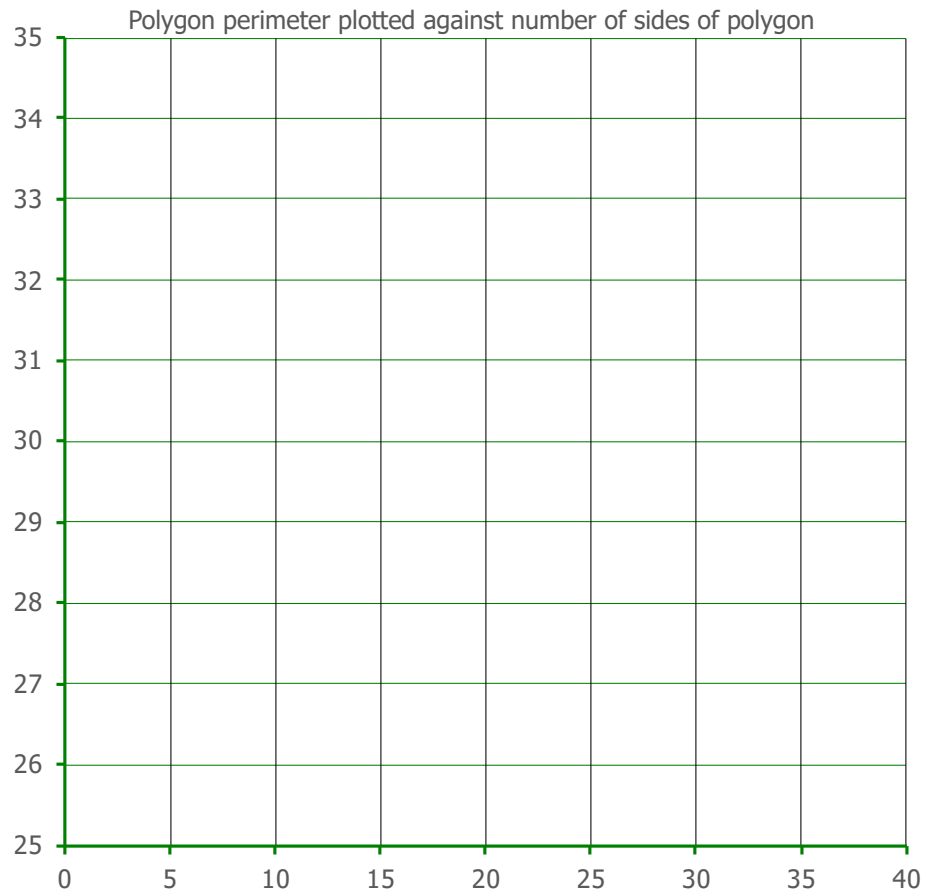
This table could be completed in the ready-made excel file: the graph will then be auto-generated.

Number of spokes	Circle diameter	Side length (end of spoke joined to end of adjacent spoke)	Total polygon perimeter (number of spokes x side length)	Ratio of perimeter to diameter
4				
6				
8				
10				
12				
18				
20				
24				
36				

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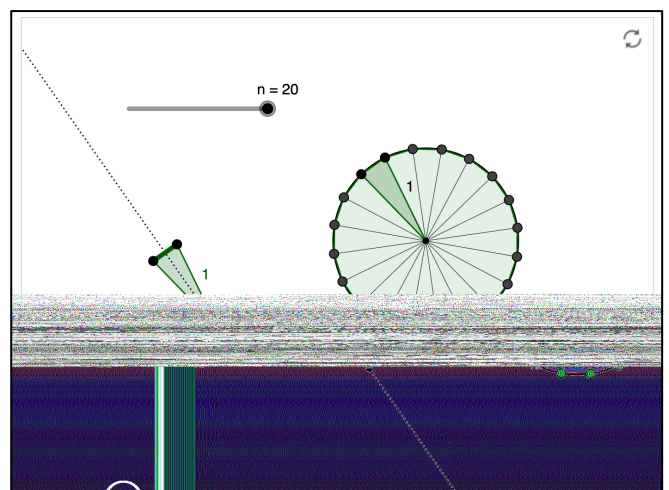
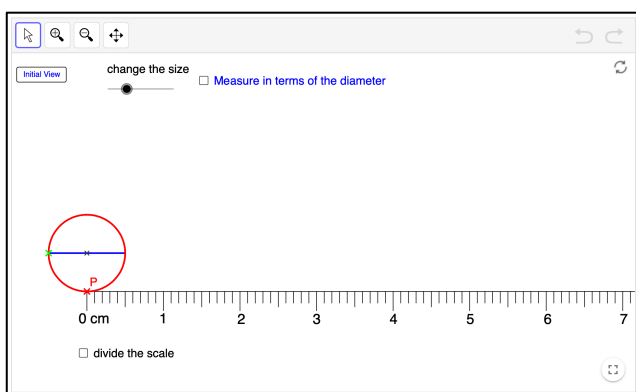
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- 6 Plot the points on the grid here where the x-values are found in the Side length column and the y-values in the Total polygon perimeter column.
- 7 What happens as the x-value increases and the polygon gets to look more like a circle?
- 8 Calculate π times the circle diameter. What do you notice?



GeoGebra interactives at:

<https://www.geogebra.org/m/FWYhSCfX> and <https://www.geogebra.org/m/jsWkBqt7>



Circles: Area Work

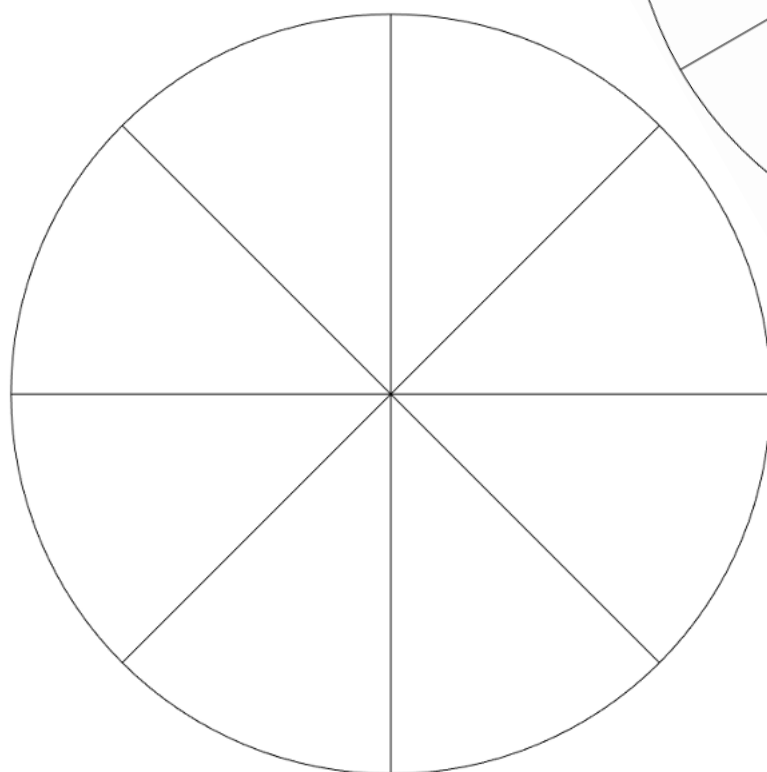
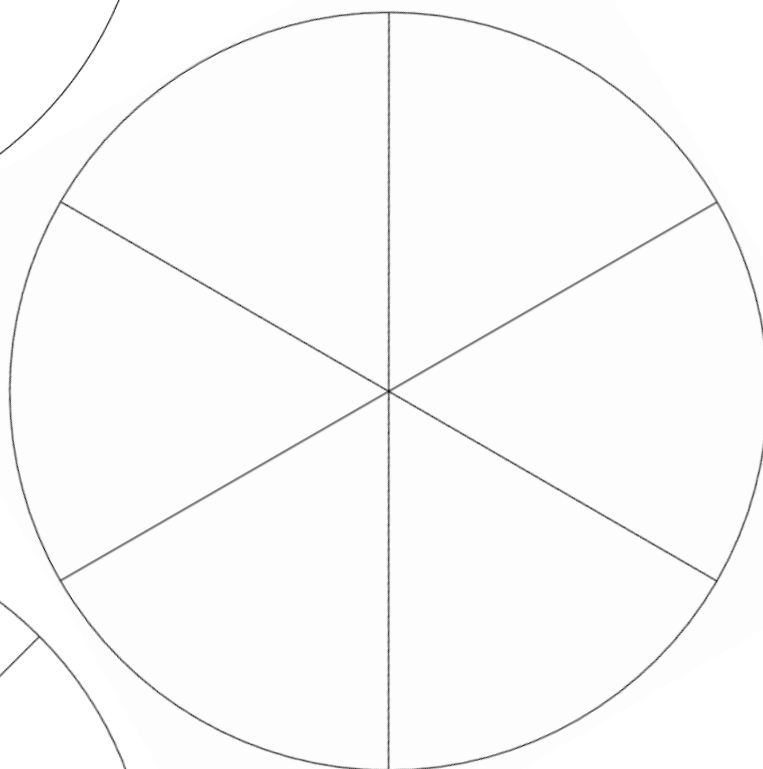
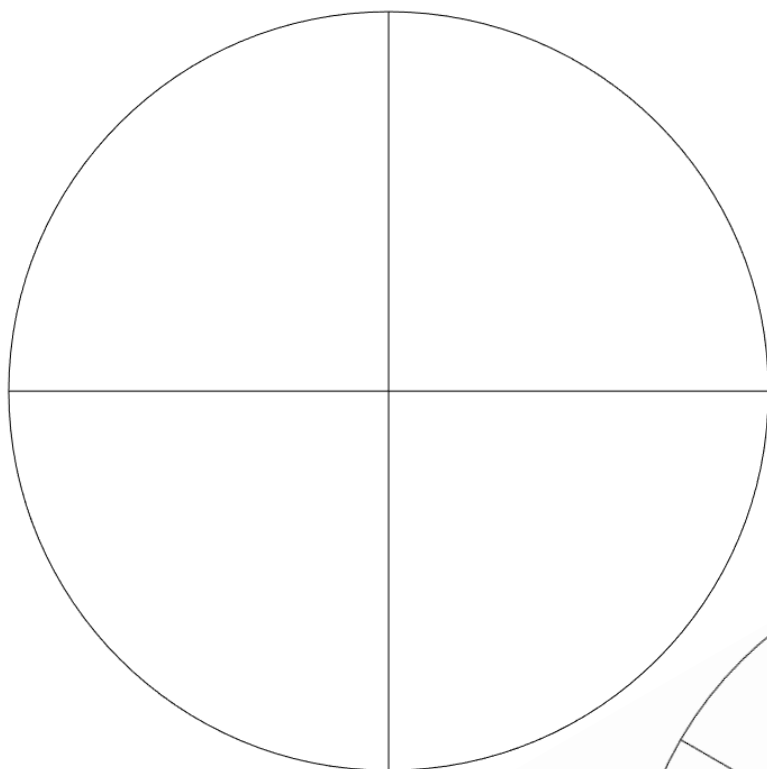
Similar files exist:

<https://spiremaths.co.uk/circlearea/>

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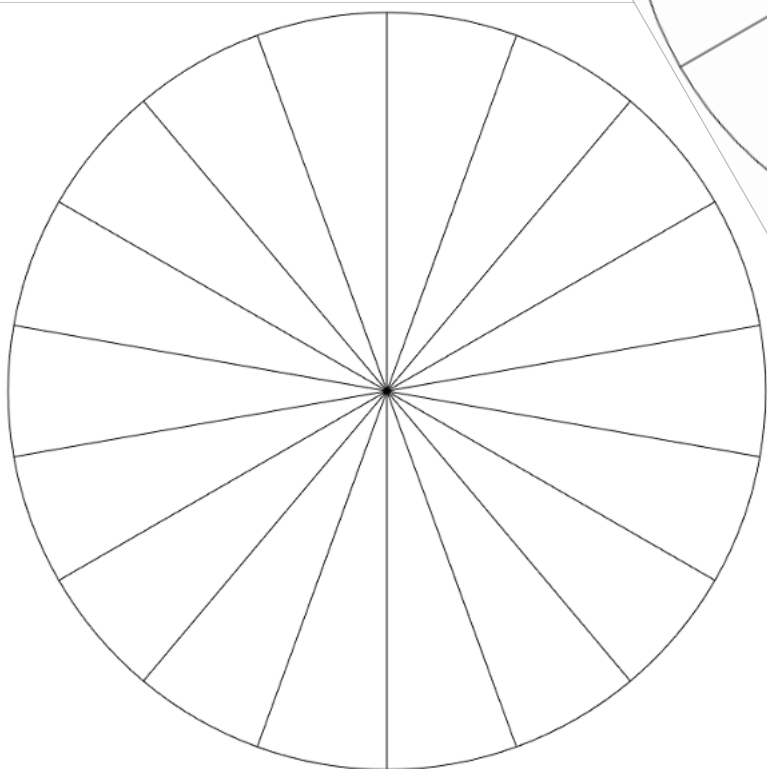
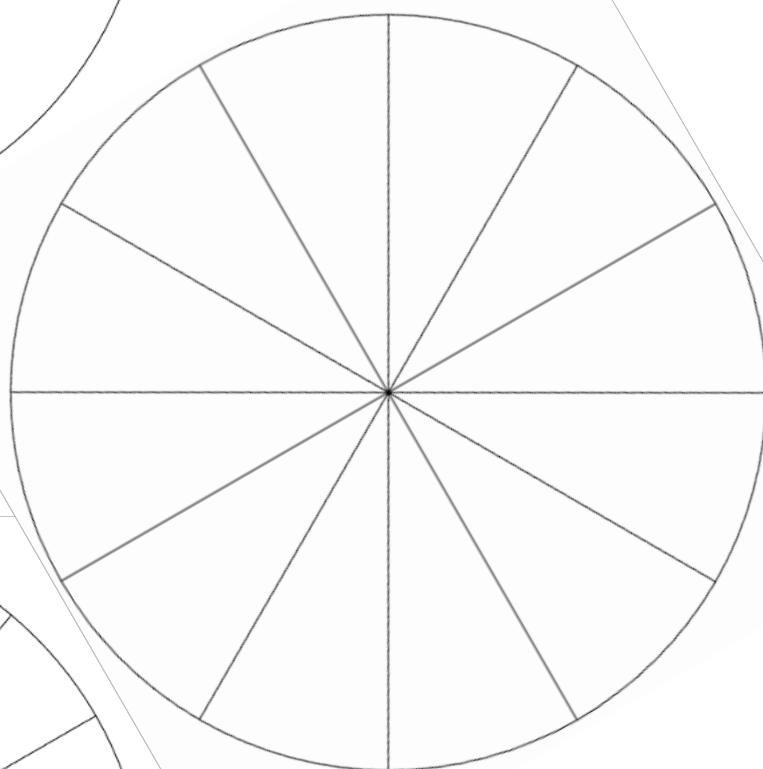
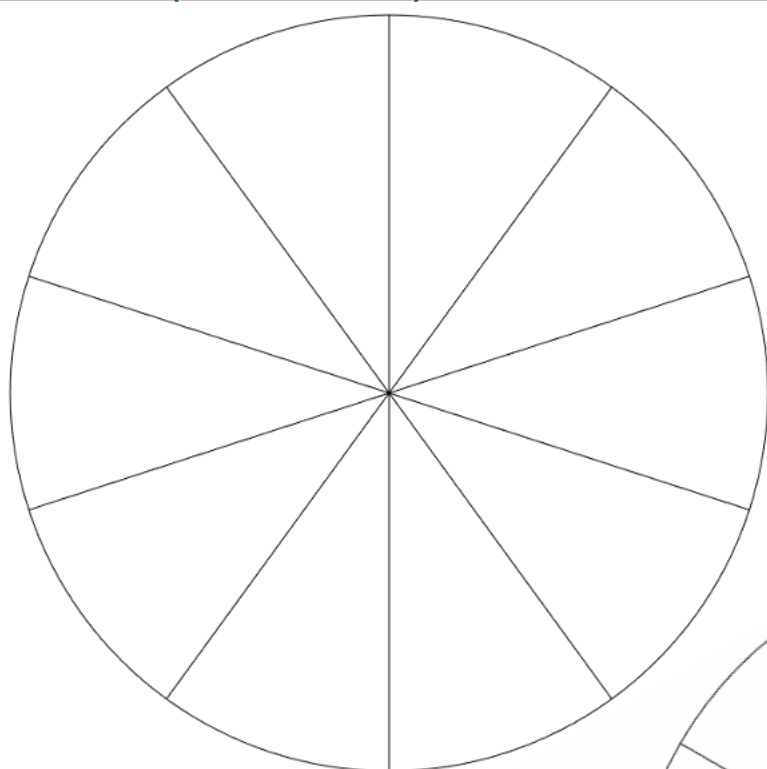
Circles (4, 6 and 8)



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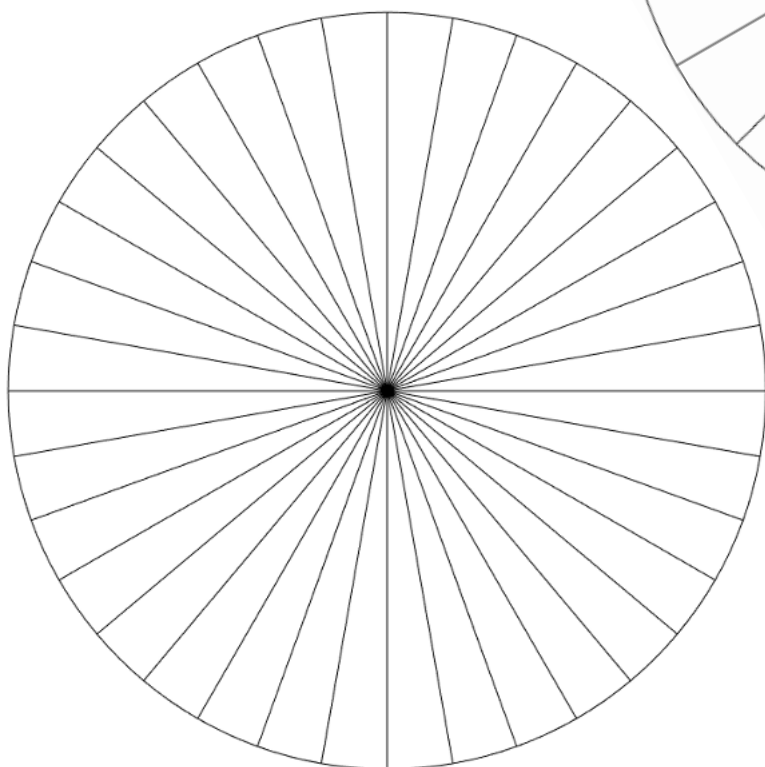
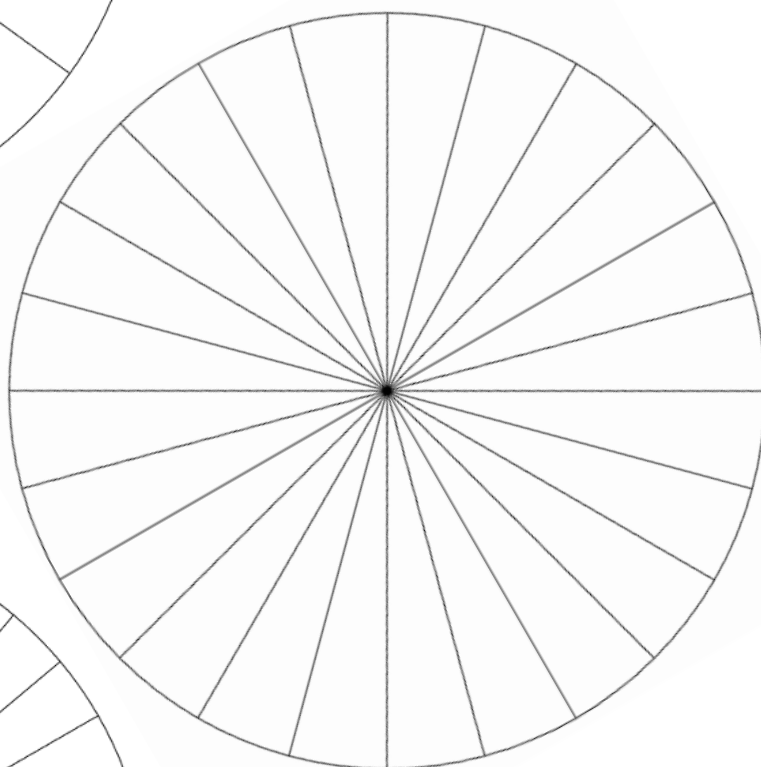
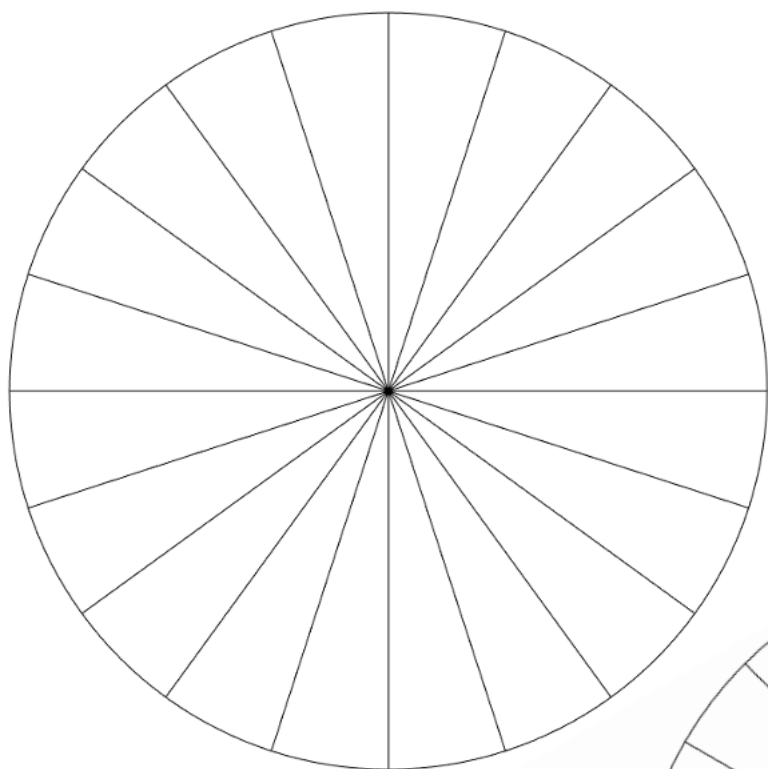
Circles (10, 12 and 18)



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Circles (20, 24 and 36)



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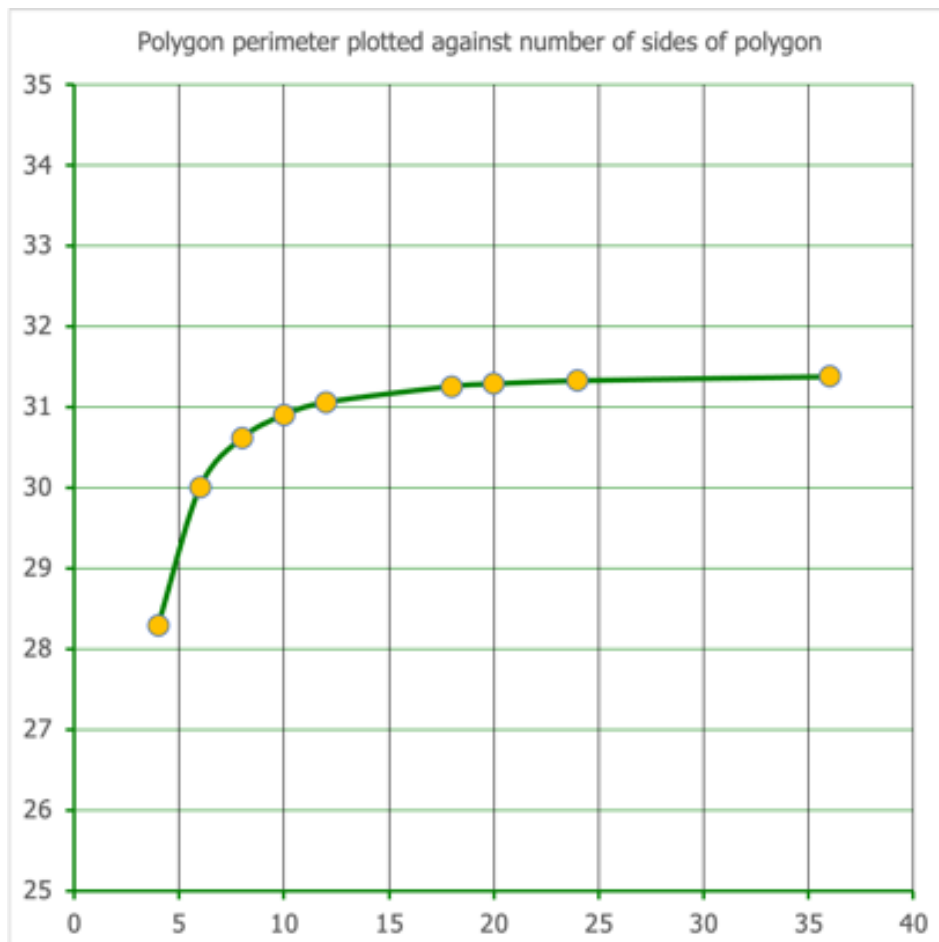
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Answers

Circles: Circumference Work

These are the calculated answers based on 10 cm diameter circles. Check on your photocopier that the diameter is 10 cm (if not increase/decrease copy size to e.g. 97% to 103%).

Number of spokes	Circle diameter (cm)	Side length (cm) (end of spoke joined to end of adjacent spoke)	Total polygon perimeter (number of spokes x side length)	Ratio of perimeter to diameter
4	10	7.071068	28.28427	2.828427
6	10	5	30	3
8	10	3.826834	30.61467	3.061467
10	10	3.09017	30.9017	3.09017
12	10	2.58819	31.05829	3.105829
18	10	1.736482	31.25667	3.125667
20	10	1.564345	31.28689	3.128689
24	10	1.305262	31.32629	3.132629
36	10	0.871557	31.37607	3.137607



An excel version is available where this can be plotted automatically, pupils just have to add the measurements.

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Possible Pupil Graph

This graph can arise from real measurements to nearest millimetre.

Number of spokes	Total polygon perimeter (number of spokes x side length)
4	28.4
6	30
8	30.4
10	31
12	31.2
18	30.6
20	32
24	31.2
36	32.4

