Angles in Polygons

Grade 4 topic · Foundation and Higher · Edexcel and AQA

How to use this pack
20 questions that get harder as you go. Foundation students: aim for Questions 1–15 (44 marks) and have a go at the rest. Higher students: complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 69 marks.

Warm-up

1 Work out the sum of the interior angles of a polygon with 14 sides. **[2 marks]**

Answer _____

2 The sum of the exterior angles of any polygon is always...? Write down the number. **[1 mark]**

Answer _____

3 Work out the size of one exterior angle of a regular polygon with 9 sides. **[2 marks]**

Answer _____

4 Work out the size of one interior angle of a regular polygon with 6 sides. **[3 marks]**

Answer _____

5 Work out the sum of the interior angles of a hexagon. **[2 marks]**

Answer _____

Core

6 A regular polygon has exterior angles of 30°. How many sides does it have? **[3 marks]**

Answer _____

7 A regular polygon has interior angles of 162°. How many sides does it have? **[3 marks]**

Answer _____

8 Three interior angles of a quadrilateral are 85°, 95° and 110°. Work out the fourth angle. **[2 marks]**

Answer _____

9 A regular polygon has 12 sides. Work out the sum of its interior angles. **[2 marks]**

Answer _____

10 Four of the five interior angles of a pentagon are 100°, 110°, 120° and 95°. Work out the fifth angle. **[3 marks]**

Answer _____

Stretch

11 The interior angles of a pentagon are x°, (x + 20)°, (x + 40)°, 2x° and (2x − 10)°. Work out x. **[5 marks]**

Answer _____

12 A regular polygon has an interior angle of 156°. How many sides does it have? **[4 marks]**

Answer _____

13 The interior angle of a regular polygon is 4 times the exterior angle. How many sides? **[5 marks]**

Answer _____

14 Work out the size of each interior angle of a regular octagon. **[3 marks]**

Answer _____

15 A regular polygon has an exterior angle of 18°. Work out the sum of its interior angles. **[4 marks]**

Answer _____

Challenge

16 A regular hexagon and a regular octagon share a side. Work out the angle between them at a shared vertex (the angle outside both polygons). **[5 marks]**

Answer _____

17 Show that the interior angle of a regular polygon with n sides is 180 − 360/n. **[5 marks]**

Answer _____

18 A regular pentagon and an equilateral triangle share a side. Work out the angle outside both at a shared vertex. **[5 marks]**

Answer _____

19 The ratio of the interior to exterior angle of a regular polygon is 5 : 1. How many sides does it have? **[5 marks]**

Answer _____

20 Work out the number of diagonals of a regular decagon (10 sides). **[5 marks]**

Answer _____