4.11 Angles in Polygons: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Find the sum of the interior angles of a pentagon.

(Total for Question 1 is 2 marks)

2 The interior angles of a polygon add up to 1440 degrees.
Work out the number of sides of the polygon.

(Total for Question 2 is 3 marks)

3 A polygon has 16 sides.
Calculate the sum of its interior angles.

(Total for Question 3 is 2 marks)

4 Find the sum of the interior angles of a regular 12-gon.

(Total for Question 4 is 3 marks)

© Revision Library | revisionlibrary.co.uk

5 A quadrilateral has angles x degrees, (x + 10) degrees, (x + 20) degrees and (x + 30) degrees.

(a) Form and solve an equation to find the value of x. **(3)**

.....

(b) Work out the size of the largest angle in the quadrilateral. **(1)**

.....

(Total for Question 5 is 4 marks)

© Revision Library | revisionlibrary.co.uk

6 A regular polygon has each interior angle equal to 156 degrees.
Show that the polygon has 15 sides.

(Total for Question 6 is 3 marks)

---

7 A classroom display shows three regular polygons side by side: a regular decagon (10 sides), a regular heptagon (7 sides) and a regular 18-sided polygon. Use the display to answer the parts below.

(a) Work out the interior angle of the regular decagon. **(2)**

.....

(b) Work out the interior angle of the regular heptagon (7 sides). Give your answer to 1 decimal place. **(3)**

.....

(c) The class teacher asks the students to find the difference between the interior angles of the 18-sided polygon and the heptagon. Find this difference and give the answer to 1 decimal place. **(5)**

.....

(Total for Question 7 is 10 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 4.11 Angles in Polygons: 30-minute Pack

Question 1

use formula (n - 2) x 180 with n = 5 **M1**

540 degrees cao **A1**

Answer: 540 degrees

Question 2

1440 / 180 (= 8) oe **M1**

n = their 8 + 2 **M1**

n = 10 cao **A1**

Answer: 10 sides

Question 3

(16 - 2) * 180 oe **M1**

2520 (degrees) cao **A1**

Answer: 2520 degrees

Question 4

use sum = (n - 2) * 180 with n = 12 **M1**

compute (12 - 2) * 180 = 10 * 180 **M1**

1800 degrees cao **A1**

Answer: 1800 degrees, since (12 - 2) * 180 = 10 * 180 = 1800 degrees.

Question 5

(a) x + (x + 10) + (x + 20) + (x + 30) = 360 oe **M1**

(a) 4x + 60 = 360 leading to 4x = 300 **M1**

(a) x = 75 cao **A1**

(a) Answer: x = 75

(b) 105 (degrees) ft their x + 30 **B1**

(b) Answer: 105 degrees

Question 6

exterior angle = 180 - 156 = 24 oe **M1**

360 / 24 **M1**

= 15 cso (answer given, full working must be shown) **A1**

Answer: 15 sides (shown)

Question 7

(a) use interior = 180 - 360/n with n = 10 or (n-2)*180/n **M1**

(a) 144 degrees cao **A1**

(a) Answer: 144 degrees

(b) use interior = 180 - 360/7 **M1**

(b) compute 360/7 = 51.428571... and interior = 128.571428... **M1**

(b) 128.6 degrees awrt (1 dp) **A1**

(b) Answer: 128.6 degrees

(c) find interior of 18-sided polygon: interior = 180 - 360/18 = 180 - 20 = 160 **M1**

(c) find interior of heptagon from part (b) 128.571428... (use ft) **M1**

(c) compute difference 160 - 128.571428... = 31.428571... **M1**

(c) round to required 1 dp **M1**

(c) 31.4 degrees awrt (1 dp) **A1**

(c) Answer: 31.4 degrees

© Revision Library | revisionlibrary.co.uk