2.10 Angles: 2-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 120 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Three of the angles in a quadrilateral are 108 degrees, 96 degrees and 66 degrees. Work out the fourth angle. Give a reason for your answer.

(Total for Question 1 is 3 marks)

---

2 Triangle ABC is isosceles with AB = AC. Angle ABC = 80 degrees. Work out the size of angle BAC.

(Total for Question 2 is 3 marks)

---

3 Angles on a point are 38 degrees, 68 degrees, 66 degrees and x degrees (with no other angles). Work out the value of x. Give a reason for your answer.

(Total for Question 3 is 3 marks)

© Revision Library | revisionlibrary.co.uk

4 Three of the angles in a quadrilateral are 84 degrees, 117 degrees and 80 degrees. Work out the fourth angle. Give a reason for your answer.

(Total for Question 4 is 3 marks)

---

5 Angles on a straight line are 62 degrees, 27 degrees, 72 degrees and x degrees (with no other angles). Work out the value of x. Give a reason for your answer.

(Total for Question 5 is 3 marks)

---

6 Three of the angles in a quadrilateral are 119 degrees, 80 degrees and 113 degrees. Work out the fourth angle. Give a reason for your answer.

(Total for Question 6 is 3 marks)

---

7 Three of the angles in a quadrilateral are 91 degrees, 117 degrees and 105 degrees. Work out the fourth angle. Give a reason for your answer.

(Total for Question 7 is 3 marks)

© Revision Library | revisionlibrary.co.uk

8 Three of the angles in a quadrilateral are 75 degrees, 92 degrees and 114 degrees. Work out the fourth angle. Give a reason for your answer.

(Total for Question 8 is 3 marks)

---

9 Three of the angles in a quadrilateral are 72 degrees, 81 degrees and 85 degrees. Work out the fourth angle. Give a reason for your answer.

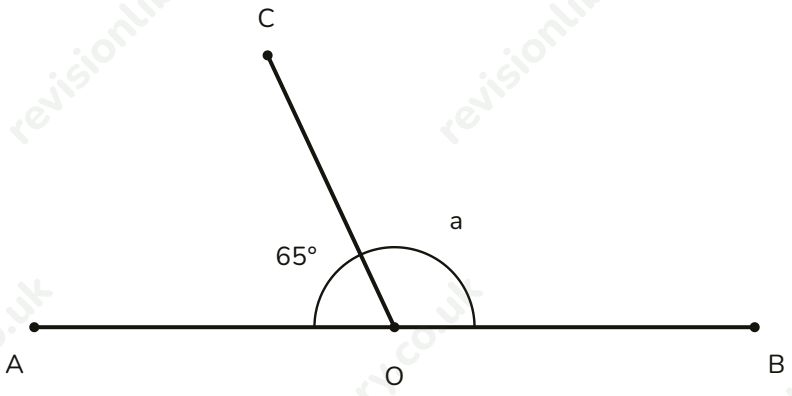
(Total for Question 9 is 3 marks)

---

10 AOB is a straight line. C is a point above the line. Angle AOC = 65 degrees. Angle COB = a.

Work out the size of angle a.

Diagram NOT accurately drawn



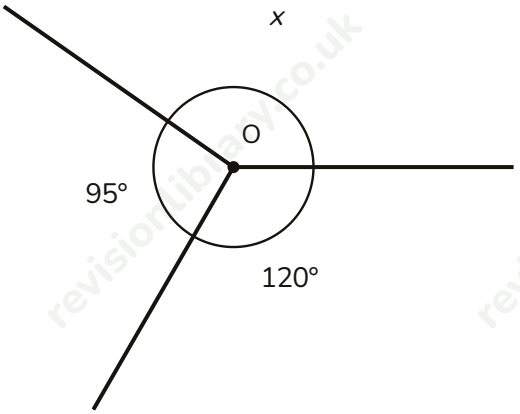
(Total for Question 10 is 2 marks)

© Revision Library | revisionlibrary.co.uk

11 Three angles meet at point O: 120 degrees, 95 degrees and x.

Work out the size of angle x.

Diagram NOT accurately drawn

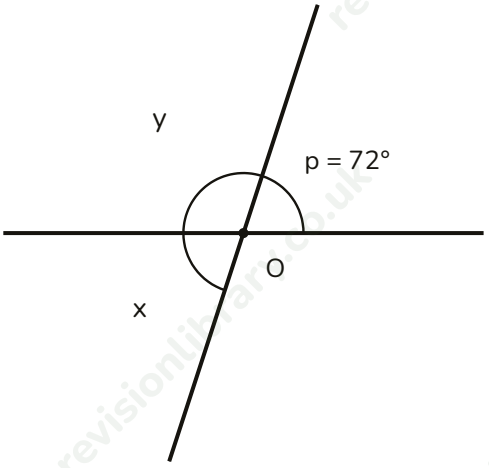


(Total for Question 11 is 2 marks)

© Revision Library | revisionlibrary.co.uk

12 Two straight lines cross at point O, forming four angles. One of the angles is marked p = 72 degrees. Angle x is vertically opposite angle p. Angle y is adjacent to angle p on a straight line.

Diagram NOT accurately drawn



(a) Write down the size of angle x. Give a reason for your answer. **(2)**

(b) Work out the size of angle y. **(2)**

(Total for Question 12 is 4 marks)

13 A quadrilateral-shaped sign has angles in the ratio 2 : 3 : 4 : 6.

Work out the size of the smallest angle.

(Total for Question 13 is 3 marks)

© Revision Library | revisionlibrary.co.uk

14 ABCDEFGH is a regular octagon.

(a) Work out the size of each exterior angle of the octagon. **(2)**

.....

(b) Work out the size of each interior angle of the octagon. **(1)**

.....

(Total for Question 14 is 3 marks)

---

15 Angles e and f are supplementary. Angle e is three times the size of angle f.

Work out the size of angle f.

(Total for Question 15 is 2 marks)

---

16 A cyclist rides on a bearing of 048 degrees. She then turns and continues on a bearing of 132 degrees.

Work out the size of the angle through which she has turned.

(Total for Question 16 is 2 marks)

---

17 Two straight lines cross at point O, forming four angles. One of the angles is 63 degrees.

Work out the sizes of the other three angles.

(Total for Question 17 is 3 marks)

© Revision Library | revisionlibrary.co.uk

18 At a roundabout, four roads meet, splitting the full turn around the roundabout into four angles. Three of the angles are equal, each measuring y, and the fourth measures 60 degrees.

Work out the size of angle y.

(Total for Question 18 is 2 marks)

---

19 Triangle XYZ has XY = XZ, so the triangle is isosceles. Angle Y = 72 degrees.

(a) Write down the size of angle Z. Give a reason for your answer. **(2)**

(b) Work out the size of angle X. **(2)**

(Total for Question 19 is 4 marks)

---

20 Triangle ABC has angle A = 50 degrees and angle B = 60 degrees.

(a) Work out the size of angle C. **(1)**

(b) Give a reason for your answer to part (a). **(1)**

(Total for Question 20 is 2 marks)

---

21 The angles in a triangle are x, 2x and 3x. Work out the value of x.

(Total for Question 21 is 2 marks)

© Revision Library | revisionlibrary.co.uk

22 Two straight lines cross. One angle is 128 degrees. Work out the size of the adjacent angle that forms a linear pair with the 128 degree angle.

(Total for Question 22 is 1 mark)

---

23 Angle m and angle n are supplementary. Angle m = 112 degrees. Work out the size of angle n.

(Total for Question 23 is 1 mark)

---

24 A triangle has one angle of 90 degrees and one angle of 34 degrees. Work out the size of the third angle.

(Total for Question 24 is 1 mark)

---

25 Each interior angle of a regular polygon is 156 degrees.

(a) Work out the size of one exterior angle of the polygon. **(1)**

.....

(b) Work out the number of sides of the polygon. **(2)**

.....

(c) Write down the mathematical name of a polygon with this number of sides. **(1)**

.....

(Total for Question 25 is 4 marks)

---

26 The angles in a triangle are in the ratio 2: 3: 4. Work out the size of each angle.

(Total for Question 26 is 2 marks)

© Revision Library | revisionlibrary.co.uk

27 In triangle ABC an exterior angle at C is 110 degrees. Work out the sum of angles A and B.

(Total for Question 27 is 1 mark)

---

28 AOB is a straight line. Angle AOC = 4x degrees and angle COB = (2x + 30) degrees. Work out the value of x.

(Total for Question 28 is 2 marks)

---

29 Triangle XYZ is isosceles, with XY = XZ. Angle X = 48 degrees.

(a) Work out the size of angle Y. **(1)**

.....

(b) Give a reason for your answer to part (a). **(1)**

.....

(Total for Question 29 is 2 marks)

---

30 In triangle GHI, the side HI is extended to a point J. The exterior angle GIJ = 132 degrees. Angle H = 58 degrees. Work out the size of angle G.

(Total for Question 30 is 1 mark)

---

31 In triangle PQR the angles are 2x, 3x - 10 and 40 degrees. Work out x.

(Total for Question 31 is 2 marks)

© Revision Library | revisionlibrary.co.uk

32 In triangle ABC angle A is twice angle B and angle C = 30 degrees. Work out the size of angles A and B.

(Total for Question 32 is 3 marks)

---

33 Two straight lines intersect. One angle is 3x + 10 degrees and the vertically opposite angle is 2x + 20 degrees. Work out the value of x and the size of the angle adjacent to 3x + 10.

(Total for Question 33 is 3 marks)

---

34 In triangle ABC the exterior angle at C is 2x + 20 degrees. The interior opposite angles are x + 10 and 3x - 5. Work out the value of x.

(Total for Question 34 is 3 marks)

© Revision Library | revisionlibrary.co.uk

35 The three angles in a triangle are (x + 30) degrees, 2x degrees and (3x + 18) degrees.

(a) Work out the value of x. **(2)**

.....

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

.....

(Total for Question 35 is 3 marks)

---

36 Two straight lines AB and CD intersect at point O. Angle AOC = (2x + 15) degrees and angle AOD = (3x - 5) degrees. Angles AOC and AOD lie on the straight line CD, so they are supplementary.

(a) Work out the value of x. **(2)**

.....

(b) Angle BOC is vertically opposite angle AOD. Work out the size of angle BOC. **(1)**

.....

(Total for Question 36 is 3 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 2.10 Angles: 2-hour Pack

Question 1

360 - (108 + 96 + 66) **M1**
90 degrees cao **A1**
angles in a quadrilateral add up to 360 degrees **B1**
Answer: 90 degrees

Question 2

80 + 80 or 2 x 80 **M1**
20 degrees cao **A1**
angles in a triangle add up to 180 **B1**
Answer: 20 degrees

Question 3

360 - 172 **M1**
x = 188 cao **A1**
Angles around a point add up to 360 degrees **B1**
Answer: x = 188; angles around a point add up to 360 degrees

Question 4

360 - (84 + 117 + 80) **M1**
79 degrees cao **A1**
angles in a quadrilateral add up to 360 degrees **B1**
Answer: 79 degrees

Question 5

180 - 161 **M1**
x = 19 cao **A1**
Angles on a straight line add up to 180 degrees **B1**
Answer: x = 19; angles on a straight line add up to 180 degrees

Question 6

360 - (119 + 80 + 113) **M1**
48 degrees cao **A1**
angles in a quadrilateral add up to 360 degrees **B1**
Answer: 48 degrees

Question 7

360 - (91 + 117 + 105) **M1**
47 degrees cao **A1**
angles in a quadrilateral add up to 360 degrees **B1**
Answer: 47 degrees

Question 8

360 - (75 + 92 + 114) **M1**
79 degrees cao **A1**
angles in a quadrilateral add up to 360 degrees **B1**
Answer: 79 degrees

Question 9

360 - (72 + 81 + 85) **M1**
122 degrees cao **A1**
angles in a quadrilateral add up to 360 degrees **B1**
Answer: 122 degrees

Question 10

180 - 65 **M1**
a = 115 cao **A1**
Answer: a = 115 degrees

Question 11

360 - 120 - 95 **M1**
x = 145 cao **A1**
Answer: x = 145 degrees

Question 12

(a) x = 72 cao **B1**
(a) correct reason given, e.g. vertically opposite angles are equal oe **B1**
(a) Answer: x = 72 degrees
(b) 180 - 72 **M1**
(b) y = 108 cao **A1**
(b) Answer: y = 108 degrees

Question 13

states angles in a quadrilateral sum to 360 (degrees) oe **B1**
360 / 15 (2 + 3 + 4 + 6 = 15 parts) oe **M1**
48 cao **A1**
Answer: 48 degrees

Question 14

(a) 360 / 8 **M1**
(a) 45 cao **A1**
(a) Answer: 45 degrees
(b) 135, ft their exterior angle **B1**
(b) Answer: 135 degrees

Question 15

e + f = 180 and e = 3f combined, e.g. 4f = 180 oe **M1**
f = 45 cao **A1**
Answer: f = 45 degrees

Question 16

132 - 48 **M1**
84 cao **A1**
Answer: 84 degrees

Question 17

63 (degrees), the angle vertically opposite the given angle **B1**
117 (degrees), one of the two angles adjacent to the given angle on a straight line **B1**
117 (degrees) ft, the remaining angle, vertically opposite the other 117 degree angle **B1**
Answer: 63 degrees, 117 degrees and 117 degrees

Question 18

3y + 60 = 360 oe, or 3y = 300 **M1**
y = 100 cao **A1**
Answer: y = 100 degrees

© Revision Library | revisionlibrary.co.uk

Question 19

(a) Z = 72 cao **B1**

(a) correct reason given, e.g. base angles of an isosceles triangle are equal oe **B1**

(a) Answer: Z = 72 degrees

(b) 180 - 72 - 72 **M1**

(b) X = 36 cao **A1**

(b) Answer: X = 36 degrees

Question 20

(a) 70 degrees cao **B1**

(a) Answer: 70 degrees

(b) angles in a triangle sum to 180 degrees oe **B1**

(b) Answer: Angles in a triangle add to 180 degrees.

Question 21

form x + 2x + 3x = 180 or 6x = 180 oe **M1**

x = 30 degrees cao **A1**

Answer: 30 degrees

Question 22

52 degrees cao **B1**

Answer: 52 degrees

Question 23

68 degrees cao **B1**

Answer: 68 degrees

Question 24

56 degrees cao **B1**

Answer: 56 degrees

Question 25

(a) 24 cao **B1**

(a) Answer: 24 degrees

(b) 360 / 24 **M1**

(b) 15 cao **A1**

(b) Answer: 15

(c) pentadecagon oe (15-sided polygon) **B1**

(c) Answer: Pentadecagon (a 15-sided polygon)

Question 26

form 2k + 3k + 4k = 180 or 9k = 180 oe **M1**

angles 40, 60 and 80 degrees cao **A1**

Answer: 40 degrees, 60 degrees and 80 degrees

Question 27

110 degrees cao **B1**

Answer: 110 degrees

Question 28

form 4x + (2x + 30) = 180 or 6x + 30 = 180 oe **M1**

x = 25 cao **A1**

Answer: x = 25

Question 29

(a) 66 degrees cao **B1**

(a) Answer: 66 degrees

(b) base angles of an isosceles triangle are equal oe **B1**

(b) Answer: Base angles in an isosceles triangle are equal.

Question 30

74 degrees cao **B1**

Answer: 74 degrees

Question 31

form 2x + (3x - 10) + 40 = 180 oe **M1**

x = 30 degrees cao **A1**

Answer: 30 degrees

Question 32

form 2x + x + 30 = 180 oe **M1**

3x = 150 oe **M1**

x = 50 and angles A = 100, B = 50 cao **A1**

Answer: Angle A = 100 degrees, Angle B = 50 degrees, Angle C = 30 degrees (x = 50 degrees).

Question 33

equate vertically opposite angles: 3x + 10 = 2x + 20 **M1**

x = 10 cao **A1**

adjacent angle = 180 - (3x + 10) = 140 degrees cao **A1**

Answer: x = 10, adjacent angle = 140 degrees

Question 34

use exterior angle theorem: 2x + 20 = (x + 10) + (3x - 5) **M1**

simplify to 2x + 20 = 4x + 5 then rearrange to 2x = 15 **M1**

x = 15/2 (or 7.5) cao **A1**

Answer: x = 15/2 (7.5)

Question 35

(a) form (x + 30) + 2x + (3x + 18) = 180 or 6x + 48 = 180 oe **M1**

(a) x = 22 cao **A1**

(a) Answer: x = 22

(b) 84 degrees ft from their x, using 3x + 18 **B1**

(b) Answer: 84 degrees

Question 36

(a) form (2x + 15) + (3x - 5) = 180 or 5x + 10 = 180 oe **M1**

(a) x = 34 cao **A1**

(a) Answer: x = 34

(b) 97 degrees ft from their x, using angle AOD = 3x - 5 **B1**

(b) Answer: 97 degrees

© Revision Library | revisionlibrary.co.uk