4.1 Geometry: Angles and Shapes: 2-hour Pack

Calculator allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A regular polygon has an exterior angle of 24 degrees.

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

.....

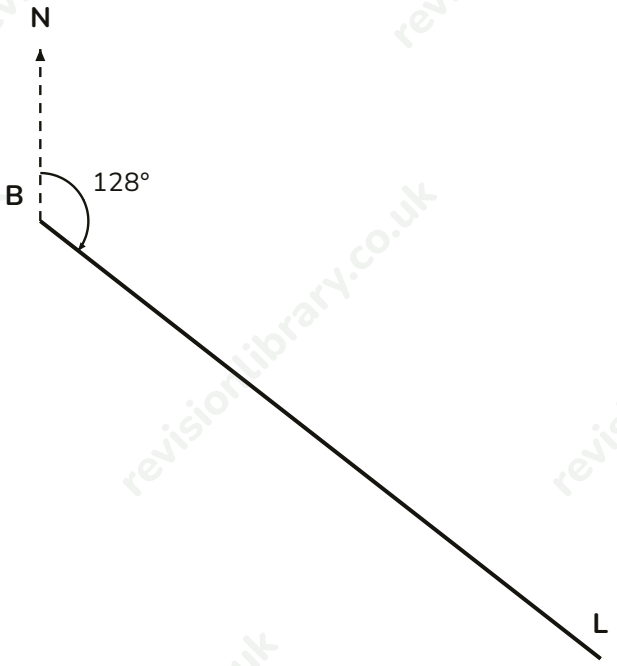
(b) Work out the size of one interior angle of this polygon. **(2)**

.....

© Revision Library | revisionlibrary.co.uk

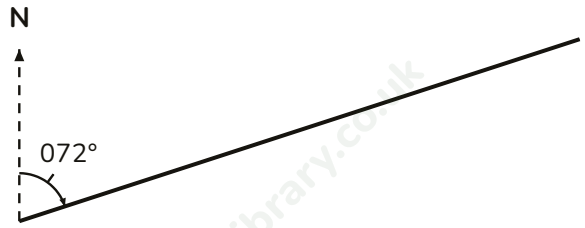
2 Bearings are always given as three-figure angles measured clockwise from north.

(a) The bearing of a lighthouse L from a boat B is 128 degrees. Work out the bearing of the boat B from the lighthouse L. **(2)**



.....

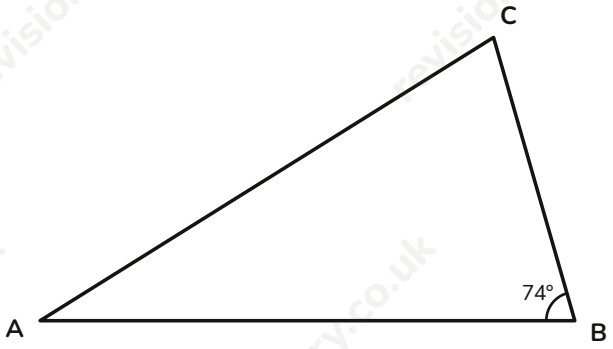
(b) A ship sails on a bearing of 072 degrees from port. State the three-figure bearing needed to sail directly back to port. **(1)**



© Revision Library | revisionlibrary.co.uk

3 Triangle ABC is isosceles with AB = AC. Angle ABC = 74°. Work out angle BAC.

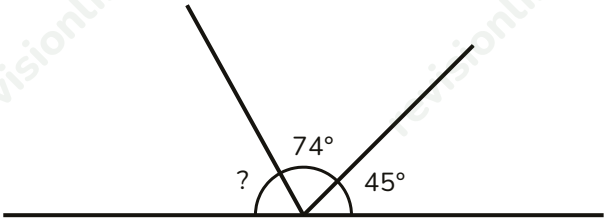
Diagram NOT accurately drawn



(3)

---

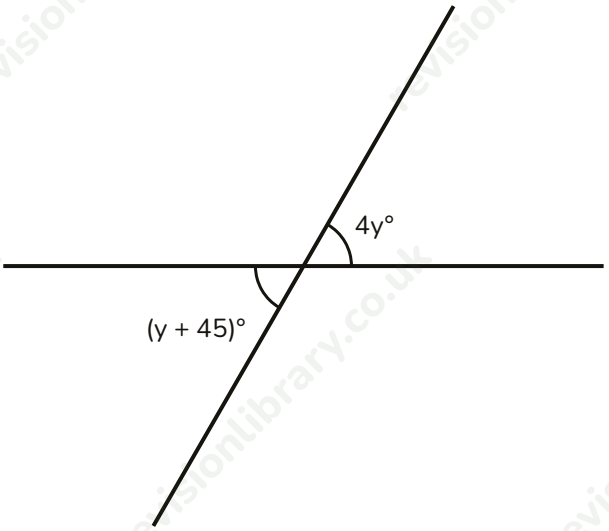
4 Three angles meet on a straight line. Two of them are 45° and 74°. Work out the third angle.



(2)

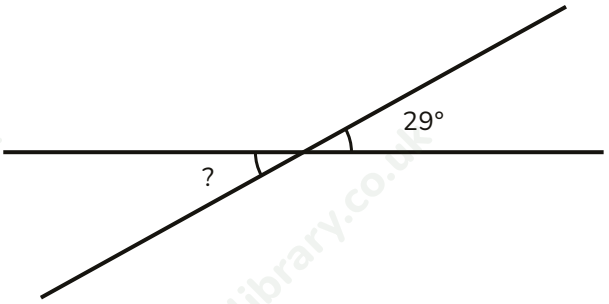
© Revision Library | revisionlibrary.co.uk

5 Two straight lines cross. Two opposite angles are 4y° and (y + 45)°. Work out the value of y and the size of each of these angles.



(3)

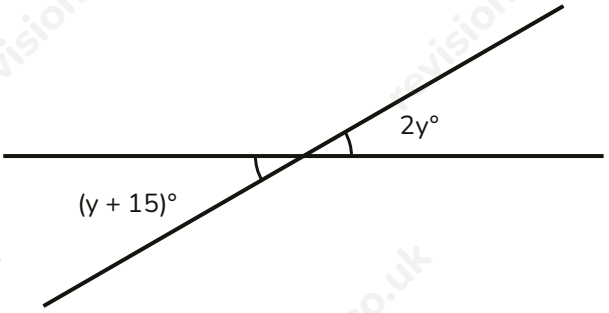
6 Two straight lines cross. One of the angles formed is 29°. Write down the size of the angle opposite it and give a reason.



(2)

© Revision Library | revisionlibrary.co.uk

7 Two straight lines cross. Two opposite angles are $2y°$ and $(y + 15)°$. Work out the value of y and the size of each of these angles.

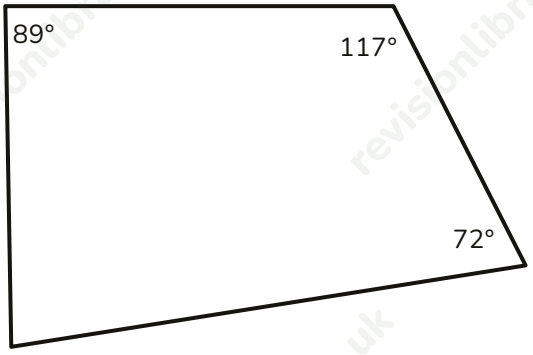


(3)

---

8 Three angles of a quadrilateral are 89°, 117° and 72°. Work out the fourth angle and say whether the quadrilateral could be a parallelogram.

Diagram NOT accurately drawn

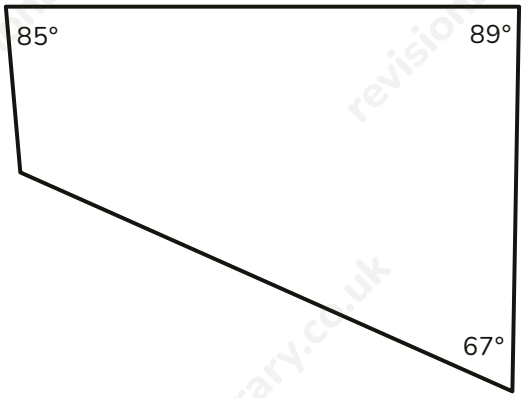


(3)

© Revision Library | revisionlibrary.co.uk

9 Three angles of a quadrilateral are 85°, 89° and 67°. Work out the fourth angle.

Diagram NOT accurately drawn



(2)

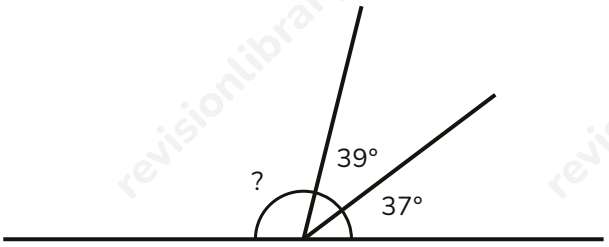
---

10 A triangle has angles 70° and 43°. Work out the third angle and describe the triangle using the words equilateral, isosceles or scalene, and acute-angled, right-angled or obtuse-angled.

(3)

---

11 Three angles meet on a straight line. Two of them are 37° and 39°. Work out the third angle.



(2)

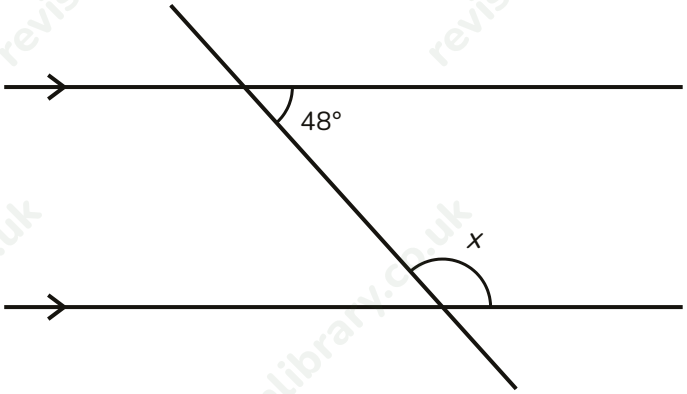
© Revision Library | revisionlibrary.co.uk

12 A triangle has angles 21° and 58°. Work out the third angle and describe the triangle using the words equilateral, isosceles or scalene, and acute-angled, right-angled or obtuse-angled.

(3)

© Revision Library | revisionlibrary.co.uk

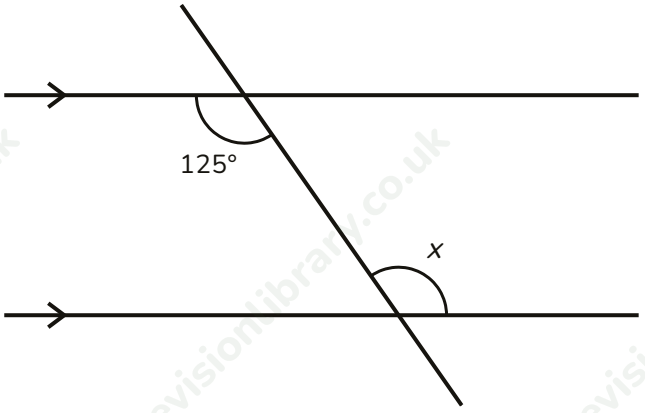
13 Two parallel lines are crossed by a third straight line. One angle is 48°. The angle marked x is between the parallel lines on the same side of the transversal (a C or U shape).
Work out the size of x, and give a reason for your answer.



(3)

---

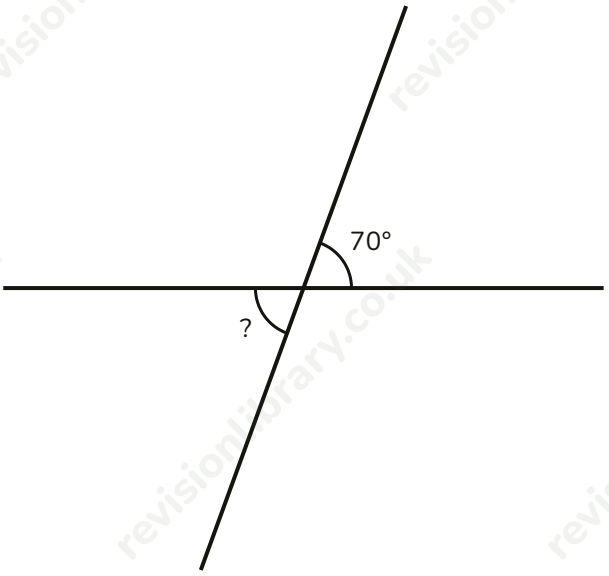
14 Two parallel lines are crossed by a third straight line. One angle is 125°. The angle marked x is on the opposite side of the transversal in between the parallel lines (a Z shape).
Work out the size of x, and give a reason for your answer.



(3)

© Revision Library | revisionlibrary.co.uk

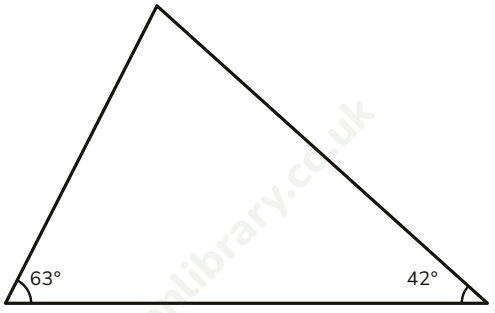
15 Two straight lines cross. One of the angles formed is 70°. Write down the size of the angle opposite it and give a reason.



(2)

16 Two angles in a triangle are 63° and 42°. Work out the third angle.

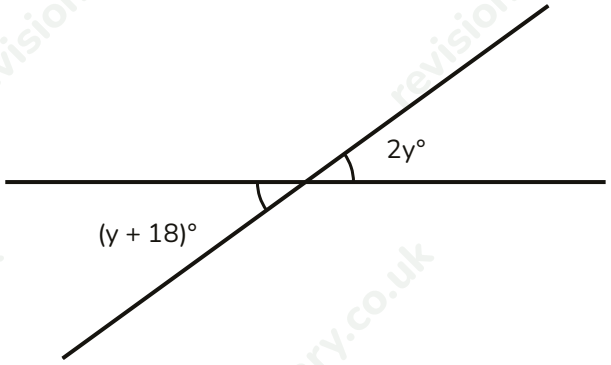
Diagram NOT accurately drawn



(2)

© Revision Library | revisionlibrary.co.uk

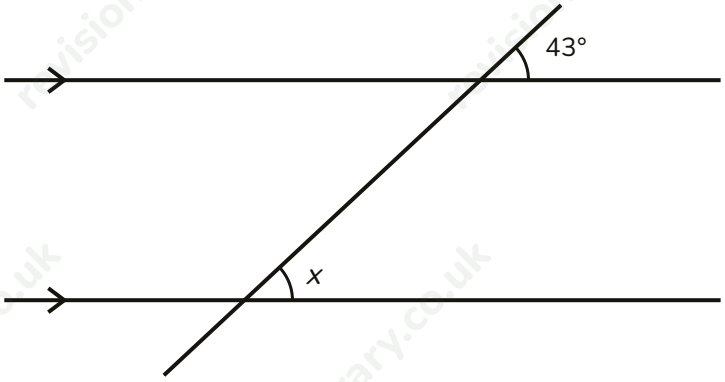
17 Two straight lines cross. Two opposite angles are 2y° and (y + 18)°. Work out the value of y and the size of each of these angles.



(3)

---

18 Two parallel lines are crossed by a third straight line. One angle is 43°. The angle marked x is in the same position at the other parallel line (an F shape).
Work out the size of x, and give a reason for your answer.

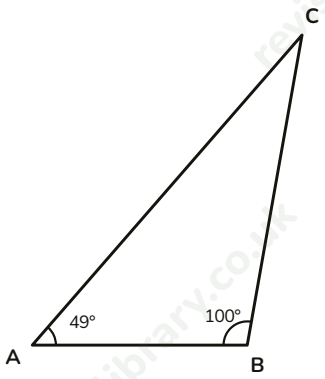


(3)

© Revision Library | revisionlibrary.co.uk

19 In triangle ABC, angle A = 49° and angle B = 100°. Work out angle C. Give a reason for your answer.

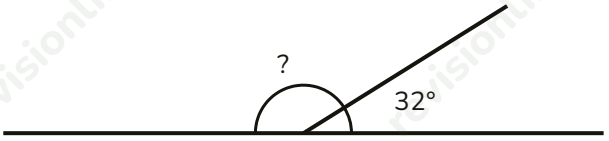
Diagram NOT accurately drawn



(3)

---

20 Angles on a straight line meet at a point. One angle is 32°. Work out the other angle.

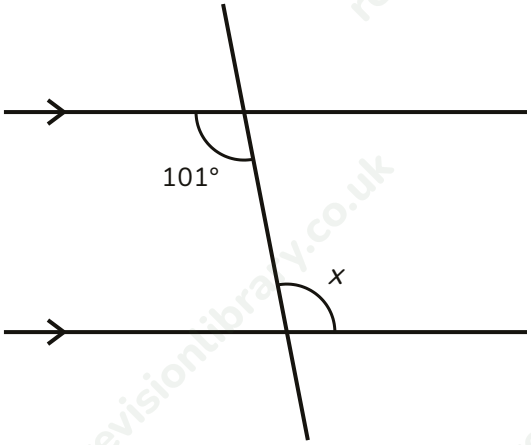


(2)

© Revision Library | revisionlibrary.co.uk

21 Two parallel lines are crossed by a third straight line. One angle is 101°. The angle marked x is on the opposite side of the transversal in between the parallel lines (a Z shape).

Work out the size of x, and give a reason for your answer.

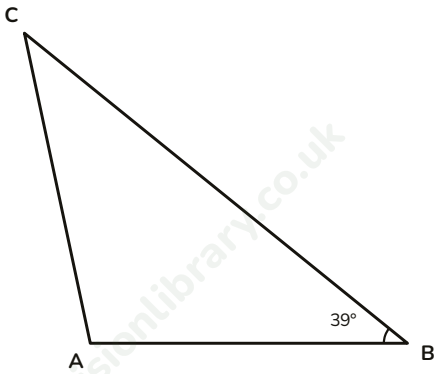


(3)

---

22 Triangle ABC is isosceles with AB = AC. Angle ABC = 39°. Work out angle BAC.

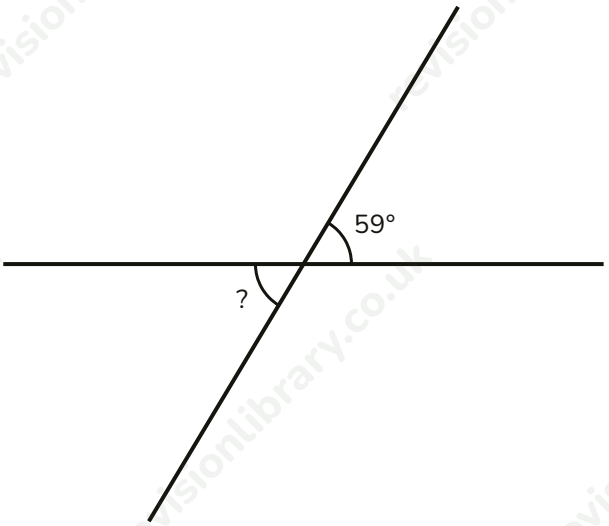
Diagram NOT accurately drawn



(3)

© Revision Library | revisionlibrary.co.uk

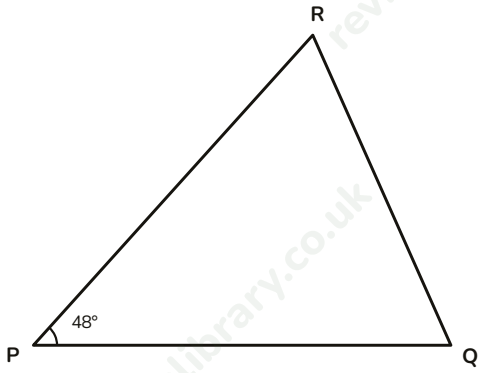
23 Two straight lines cross. One of the angles formed is 59°. Write down the size of the angle opposite it and give a reason.



(2)

24 Triangle PQR is isosceles with PQ = PR. Angle QPR = 48°. Work out angle PQR.

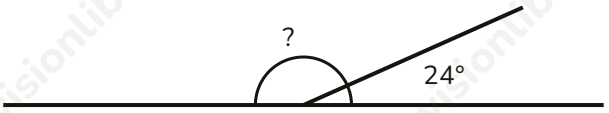
Diagram NOT accurately drawn



(3)

© Revision Library | revisionlibrary.co.uk

25 Angles on a straight line meet at a point. One angle is 24°. Work out the other angle.

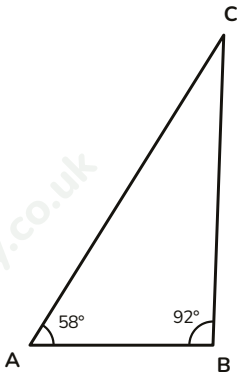


(2)

---

26 In triangle ABC, angle A = 58° and angle B = 92°. Work out angle C. Give a reason for your answer.

Diagram NOT accurately drawn



(3)

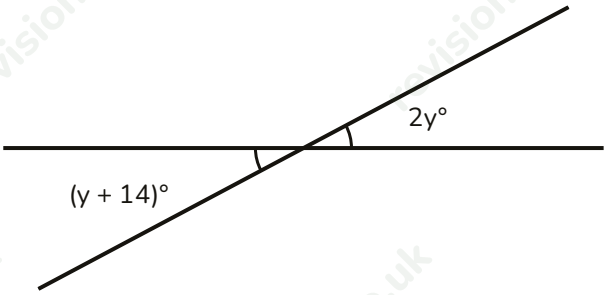
---

27 A triangle has angles 95° and 29°. Work out the third angle and describe the triangle using the words equilateral, isosceles or scalene, and acute-angled, right-angled or obtuse-angled.

(3)

© Revision Library | revisionlibrary.co.uk

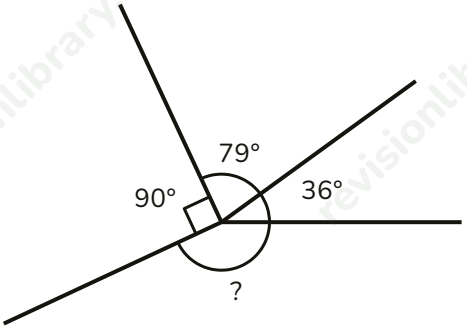
28 Two straight lines cross. Two opposite angles are $2y°$ and $(y + 14)°$. Work out the value of y and the size of each of these angles.



(3)

---

29 Four angles meet at a point. Three of them are 36°, 79° and 90°. Work out the fourth angle. Give a reason for your answer.

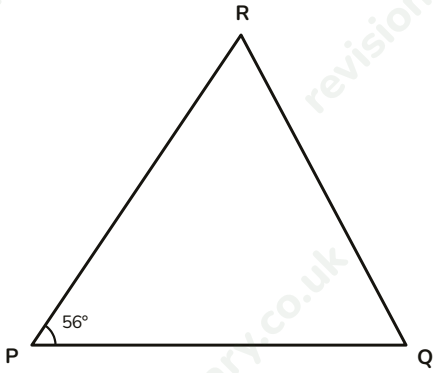


(3)

© Revision Library | revisionlibrary.co.uk

30 Triangle PQR is isosceles with PQ = PR. Angle QPR = 56°. Work out angle PQR.

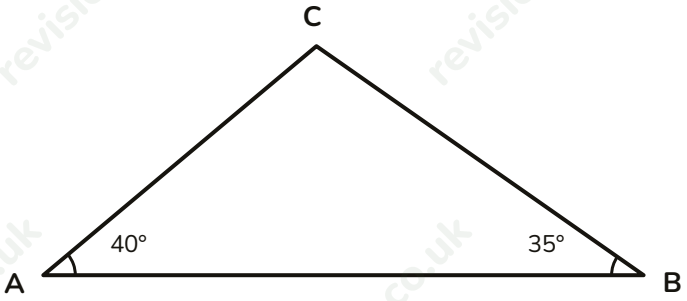
Diagram NOT accurately drawn



(3)

31 In triangle ABC, angle A = 40° and angle B = 35°. Work out angle C. Give a reason for your answer.

Diagram NOT accurately drawn

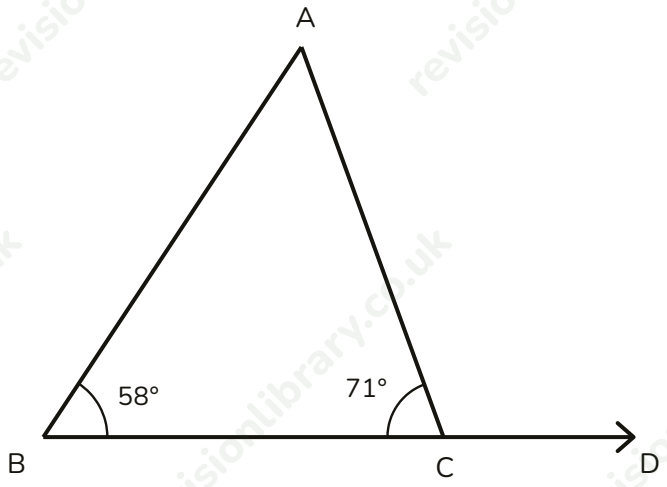


(3)

© Revision Library | revisionlibrary.co.uk

32 The side BC of triangle ABC is extended to a point D. Angle ABC = 58 degrees and angle BCA = 71 degrees.

Diagram NOT accurately drawn



(a) Work out the exterior angle, ACD. **(2)**

.....

(b) State the geometric fact about the exterior angle of a triangle that you could use to check your answer to part (a). **(1)**

© Revision Library | revisionlibrary.co.uk

33 The interior angle of a regular polygon is 156 degrees.

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

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

(c) A different regular polygon has n sides. Show that its interior angle can be written as ((n - 2) x 180) / n degrees, and use this to find the interior angle when n = 20. **(3)**

© Revision Library | revisionlibrary.co.uk

Mark scheme · 4.1 Geometry: Angles and Shapes: 2-hour Pack

Question 1

(a) 360 / 24 oe	M1
(a) 15 cao	A1
(a) Answer: **15 sides**	
(b) 180 - 24 oe	M1
(b) 156 cao	A1
(b) Answer: **156 degrees**	

Question 2

(a) 128 + 180 oe, since the given bearing is less than 180	M1
(a) 308 cao	A1
(a) Answer: **308 degrees**	
(b) 252 cao	B1
(b) Answer: **252 degrees**	

Question 3

angle ACB = 74° (base angles equal)	M1
180 - 2 x 74	M1
32° cao	A1
Answer: **32°**	

Question 4

180 - 45 - 74 or 180 - 119	M1
61° cao	A1
Answer: **61°**	

Question 5

4y = y + 45	M1
y = 15	A1
each angle is 60°	A1
Answer: **y = 15, angles are 60°**	

Question 6

29°	B1
vertically opposite angles are equal	B1
Answer: **29° (vertically opposite angles are equal)**	

Question 7

2y = y + 15	M1
y = 15	A1
each angle is 30°	A1
Answer: **y = 15, angles are 30°**	

Question 8

360 - 278	M1
82°	A1
concludes it cannot be a parallelogram because opposite angles must be equal and no two angles are equal	B1
Answer: **82°; it cannot be a parallelogram**	

Question 9

360 - 85 - 89 - 67 or 360 - 241	M1
119° cao	A1
Answer: **119°**	

Question 10

180 - 70 - 43	M1
67°	A1
scalene and acute-angled	B1
Answer: **67°; scalene, acute-angled**	

Question 11

180 - 37 - 39 or 180 - 76	M1
104° cao	A1
Answer: **104°**	

Question 12

180 - 21 - 58	M1
101°	A1
scalene and obtuse-angled	B1
Answer: **101°; scalene, obtuse-angled**	

Question 13

correct angle fact identified	M1
132° cao	A1
co-interior angles add up to 180 degrees	B1
Answer: **132° (co-interior angles add up to 180 degrees)**	

Question 14

correct angle fact identified	M1
125° cao	A1
alternate angles are equal	B1
Answer: **125° (alternate angles are equal)**	

Question 15

70°	B1
vertically opposite angles are equal	B1
Answer: **70° (vertically opposite angles are equal)**	

Question 16

180 - 63 - 42 or 180 - 105	M1
75° cao	A1
Answer: **75°**	

Question 17

2y = y + 18	M1
y = 18	A1
each angle is 36°	A1
Answer: **y = 18, angles are 36°**	

Question 18

correct angle fact identified	M1
43° cao	A1
corresponding angles are equal	B1
Answer: **43° (corresponding angles are equal)**	

© Revision Library | revisionlibrary.co.uk

Question 19

180 - 49 - 100	M1
31° cao	A1
angles in a triangle add up to 180 degrees	B1

Answer: **31° (angles in a triangle add up to 180°)**

Question 20

180 - 32	M1
148° cao	A1

Answer: **148°**

Question 21

correct angle fact identified	M1
101° cao	A1
alternate angles are equal	B1

Answer: **101° (alternate angles are equal)**

Question 22

angle ACB = 39° (base angles equal)	M1
180 - 2 x 39	M1
102° cao	A1

Answer: **102°**

Question 23

59°	B1
vertically opposite angles are equal	B1

Answer: **59° (vertically opposite angles are equal)**

Question 24

180 - 48	M1
(132) / 2	M1
66° cao	A1

Answer: **66°**

Question 25

180 - 24	M1
156° cao	A1

Answer: **156°**

Question 26

180 - 58 - 92	M1
30° cao	A1
angles in a triangle add up to 180 degrees	B1

Answer: **30° (angles in a triangle add up to 180°)**

Question 27

180 - 95 - 29	M1
56°	A1
scalene and obtuse-angled	B1

Answer: **56°; scalene, obtuse-angled**

Question 28

2y = y + 14	M1
y = 14	A1
each angle is 28°	A1

Answer: **y = 14, angles are 28°**

Question 29

360 - 36 - 79 - 90 or 360 - 205	M1
155° cao	A1
angles around a point add up to 360 degrees	B1

Answer: **155° (angles around a point add up to 360°)**

Question 30

180 - 56	M1
(124) / 2	M1
62° cao	A1

Answer: **62°**

Question 31

180 - 40 - 35	M1
105° cao	A1
angles in a triangle add up to 180 degrees	B1

Answer: **105° (angles in a triangle add up to 180°)**

Question 32

(a) 180 - 71 oe, or 180 - 58 - 71 then add 58	M1
(a) angle ACD = 109 cao	A1

(a) Answer: **Angle ACD = 109 degrees**

(b) the exterior angle of a triangle equals the sum of the two interior opposite angles (here angle BAC + angle ABC)	B1

(b) Answer: **The exterior angle equals the sum of the two interior opposite angles**

Question 33

(a) 24 cao	B1

(a) Answer: **24 degrees**

(b) 360 / 24 oe, ft from part (a)	M1
(b) 15 cao	A1

(b) Answer: **15 sides**

(c) correct reasoning that the sum of interior angles is (n-2) x 180, shared equally between the n equal angles of a regular polygon	M1
(c) cso: interior angle = ((n-2) x 180) / n stated	A1
(c) n = 20 gives 162 degrees, cao	A1

(c) Answer: **((n - 2) x 180) / n; when n = 20, interior angle = 162 degrees**

© Revision Library | revisionlibrary.co.uk