4.4 Angles: Lines, Points and Triangles: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Three angles of a quadrilateral are 71°, 63° and 60°. Work out the fourth angle and say whether the quadrilateral could be a parallelogram.

(3)

2 Two straight lines cross. One of the angles formed is 48°. Write down the size of the angle opposite it and give a reason.

(2)

3 In triangle ABC, angle A = 74° and angle B = 25°. Work out angle C. Give a reason for your answer.

(3)

4 Three angles of a quadrilateral are 108°, 67° and 40°. Work out the fourth angle and say whether the quadrilateral could be a parallelogram.

(3)

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5 Two straight lines cross. One of the angles formed is 72°. Write down the size of the angle opposite it and give a reason.

(2)

6 Three angles of a quadrilateral are 130°, 68° and 100°. Work out the fourth angle and say whether the quadrilateral could be a parallelogram.

(3)

7 Two straight lines cross. Two opposite angles are $4y°$ and $(y + 48)°$. Work out the value of y and the size of each of these angles.

(3)

8 Three angles of a quadrilateral are 126°, 92° and 64°. Work out the fourth angle.

(2)

9 In triangle ABC, angle A = 57° and angle B = 100°. Work out angle C. Give a reason for your answer.

(3)

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10 Three angles of a quadrilateral are 76°, 77° and 73°. Work out the fourth angle.

(2)

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11 Triangle PQR is isosceles with PQ = PR. Angle QPR = 74°. Work out angle PQR.

(3)

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12 Three angles of a quadrilateral are 82°, 117° and 42°. Work out the fourth angle.

(2)

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13 Triangle ABC is isosceles with AB = AC. Angle ABC = 60°. Work out angle BAC.

(3)

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14 A triangle has angles 49°, 49° and an unknown angle. Work out the unknown angle and name the type of triangle.

(3)

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15 Triangle PQR is isosceles with PQ = PR. Angle QPR = 122°. Work out angle PQR.

(3)

---

16 Four angles meet at a point. Three of them are 64°, 66° and 90°. Work out the fourth angle. Give a reason for your answer.

(3)

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17 Two straight lines cross. Two opposite angles are $3y°$ and $(y + 28)°$. Work out the value of y and the size of each of these angles.

(3)

---

18 Angles on a straight line meet at a point. One angle is 52°. Work out the other angle.

(2)

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19 In triangle ABC, angle A = 88° and angle B = 64°. The side AC is extended to D, beyond C. Work out the size of the exterior angle BCD.

(2)

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20 Two angles in a triangle are 57° and 58°. Work out the third angle.

(2)

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21 Three angles of a quadrilateral are 69°, 70° and 84°. Work out the fourth angle.

(2)

---

22 Angles on a straight line meet at a point. One angle is 40°. Work out the other angle.

(2)

---

23 Angles on a straight line meet at a point. One angle is 77°. Work out the other angle.

(2)

---

24 Two angles in a triangle are 80° and 22°. Work out the third angle.

(2)

---

25 Two straight lines cross. One angle is 2x degrees. The angle vertically opposite to it is 50 degrees. Work out x.

(2)

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26 Three angles meet on a straight line. Two of them are 74° and 41°. Work out the third angle.

(2)

---

27 At a point three adjacent angles are 3x degrees, x + 40 degrees and 2x + 20 degrees. Find x.

(3)

---

28 A straight line has one angle of 128 degrees on one side. Write down the angle on the other side of the straight line.

(1)

---

29 An exterior angle of a triangle is 130 degrees. This exterior angle equals the sum of the two opposite interior angles. One of the opposite interior angles is 55 degrees. Find the other.

(2)

---

30 On a straight line, three adjacent angles are x degrees, x + 30 degrees and 2x + 10 degrees. Find x.

(2)

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31 At a point, three adjacent angles are 4x degrees, 2x + 30 degrees and x + 50 degrees. Find x.

(3)

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32 In triangle PQR, angle P = (x + 15) degrees, angle Q = (2x - 5) degrees and angle R = 50 degrees. Work out x and then find angle Q.

(3)

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33 A road is straight. A path leaves the road, making an angle of (4x + 10) degrees with the road on one side and (2x + 20) degrees with the road on the other side. Find x.

(3)

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34 Stretch question. A large triangle has angles 55 degrees and 65 degrees. A line from the vertex between these two angles splits the third angle into two parts in the ratio 2:3. Find the size of each of the two parts.

(4)

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35 At a point, three angles are 95 degrees, 140 degrees and x degrees. Work out x.

(1)

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36 In triangle ABC, angle A = 35 degrees and angle B = 85 degrees. Work out angle C.

(2)

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37 A triangle has one interior angle of 50 degrees and another of 70 degrees. State the exterior angle at the third vertex.

(1)

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38 On a straight line, two adjacent angles are 3x degrees and 45 degrees. Find x.

(2)

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39 Two straight lines cross. One angle is 3x degrees. The angle vertically opposite to it is 57 degrees. Work out x.

(2)

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Mark scheme · 4.4 Angles: Lines, Points and Triangles: 2-hour Pack

Question 1

360 - 194	M1
166°	A1
parallelogram needs opposite angles equal; check pairs	B1

Answer: **166°; it cannot be a parallelogram**

Question 2

48°	B1
vertically opposite angles are equal	B1

Answer: **48° (vertically opposite angles are equal)**

Question 3

180 - 74 - 25	M1
81° cao	A1
angles in a triangle add up to 180 degrees	B1

Answer: **81° (angles in a triangle add up to 180°)**

Question 4

360 - 215	M1
145°	A1
parallelogram needs opposite angles equal; check pairs	B1

Answer: **145°; it cannot be a parallelogram**

Question 5

72°	B1
vertically opposite angles are equal	B1

Answer: **72° (vertically opposite angles are equal)**

Question 6

360 - 298	M1
62°	A1
parallelogram needs opposite angles equal; check pairs	B1

Answer: **62°; it cannot be a parallelogram**

Question 7

4y = y + 48	M1
y = 16	A1
each angle is 64°	A1

Answer: **y = 16, angles are 64°**

Question 8

360 - 126 - 92 - 64 or 360 - 282	M1
78° cao	A1

Answer: **78°**

Question 9

180 - 57 - 100	M1
23° cao	A1
angles in a triangle add up to 180 degrees	B1

Answer: **23° (angles in a triangle add up to 180°)**

Question 10

360 - 76 - 77 - 73 or 360 - 226	M1
134° cao	A1

Answer: **134°**

Question 11

180 - 74	M1
(106) ÷ 2	M1
53° cao	A1

Answer: **53°**

Question 12

360 - 82 - 117 - 42 or 360 - 241	M1
119° cao	A1

Answer: **119°**

Question 13

angle ACB = 60° (base angles equal)	M1
180 - 2 x 60	M1
60° cao	A1

Answer: **60°**

Question 14

180 - 2 x 49	M1
82°	A1
isosceles	B1

Answer: **82°, isosceles**

Question 15

180 - 122	M1
(58) ÷ 2	M1
29° cao	A1

Answer: **29°**

Question 16

360 - 64 - 66 - 90 or 360 - 220	M1
140° cao	A1
angles around a point add up to 360 degrees	B1

Answer: **140° (angles around a point add up to 360°)**

Question 17

3y = y + 28	M1
y = 14	A1
each angle is 42°	A1

Answer: **y = 14, angles are 42°**

Question 18

180 - 52	M1
128° cao	A1

Answer: **128°**

Question 19

88 + 64 or 180 - 28	M1
152° cao	A1

Answer: **152°**

Question 20

180 - 57 - 58 or 180 - 115	M1
65° cao	A1

Answer: **65°**

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Question 21

360 - 69 - 70 - 84 or 360 - 223	M1
137° cao	A1

Answer: **137°**

Question 22

180 - 40	M1
140° cao	A1

Answer: **140°**

Question 23

180 - 77	M1
103° cao	A1

Answer: **103°**

Question 24

180 - 80 - 22 or 180 - 102	M1
78° cao	A1

Answer: **78°**

Question 25

uses vertically opposite angles equal so 2x = 50	M1
x = 25 cao	A1

Answer: **25**

Question 26

180 - 74 - 41 or 180 - 115	M1
65° cao	A1

Answer: **65°**

Question 27

forms equation 3x + (x+40) + (2x+20) = 360 or equivalent	M1
correctly simplifies to 6x + 60 = 360 and obtains 6x = 300	M1
x = 50 cao	A1

Answer: **50**

Question 28

52 degrees cao	B1

Answer: **52 degrees**

Question 29

uses exterior angle = sum of the two opposite interior angles: missing = 130 - 55	M1
75 degrees cao	A1

Answer: **75 degrees**

Question 30

forms equation x + (x+30) + (2x+10) = 180	M1
x = 35 cao	A1

Answer: **35**

Question 31

forms equation 4x + (2x+30) + (x+50) = 360 or equivalent	M1
simplifies to 7x + 80 = 360 and obtains 7x = 280	M1
x = 40 cao	A1

Answer: **40**

Question 32

forms equation (x+15) + (2x-5) + 50 = 180	M1
simplifies to 3x + 60 = 180 and solves x = 40	M1
angle Q = 75 degrees cao	A1

Answer: **x = 40, angle Q = 75 degrees**

Question 33

sets up (4x+10) + (2x+20) = 180	M1
simplifies to 6x + 30 = 180 and obtains 6x = 150	M1
x = 25 cao	A1

Answer: **25**

Question 34

finds the third angle: 180 - (55 + 65) = 60 degrees	M1
recognises the third angle splits into 5 equal ratio parts	M1
finds one part = 60 / 5 = 12 degrees	M1
the two parts are 24 degrees and 36 degrees cao	A1

Answer: **24 degrees and 36 degrees**

Question 35

x = 125 degrees cao	B1

Answer: **125 degrees**

Question 36

uses sum of angles in a triangle = 180 oe	M1
angle C = 60 degrees cao	A1

Answer: **60 degrees**

Question 37

120 degrees cao (exterior angle = sum of the two remote interior angles)	B1

Answer: **120 degrees**

Question 38

sets up 3x + 45 = 180 or equivalent	M1
x = 45 cao	A1

Answer: **45**

Question 39

uses vertically opposite angles equal so 3x = 57	M1
x = 19 cao	A1

Answer: **19**

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