2.93 Angles on Lines, at Points and in Triangles: Test Pack

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A straight line contains two adjacent angles. One angle measures 65 degrees and the other is x degrees. What is x?

- ☐ A) 65
- ☐ B) 115
- ☐ C) 125
- ☐ D) 55
- ☐ E) 180

---

2 Angles on a straight line are 15° and 60° and x. What is the size of angle x?

- ☐ A) 15°
- ☐ B) 285°
- ☐ C) 115°
- ☐ D) 105°
- ☐ E) 75°

---

3 Two angles on a straight line are 150° and x. What is the size of angle x?

- ☐ A) 210°
- ☐ B) 40°
- ☐ C) 60°
- ☐ D) 30°
- ☐ E) 150°

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4 Angles around a point are 140°, 100° and 25° and x. What is the size of angle x?

- ☐ A) 265°
- ☐ B) 95°
- ☐ C) 105°
- ☐ D) 85°
- ☐ E) 175°

---

5 Angles on a straight line are 90° and 60° and x. What is the size of angle x?

- ☐ A) 30°
- ☐ B) 210°
- ☐ C) 150°
- ☐ D) 40°
- ☐ E) 60°

---

6 Angles around a point are 100° and 200° and x. What is the size of angle x?

- ☐ A) 210°
- ☐ B) 300°
- ☐ C) 70°
- ☐ D) 60°
- ☐ E) 50°

---

7 Give a brief reason why the three interior angles of any triangle add up to 180 degrees.

(1)

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8 An isosceles triangle has an angle of 70° between its two equal sides. What is the size of each of the other two angles?

- ☐ A) 70°
- ☐ B) 145°
- ☐ C) 110°
- ☐ D) 56°
- ☐ E) 55°

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9 An isosceles triangle has two equal base angles of 52° each. What is the third angle?

- ☐ A) 77°
- ☐ B) 104°
- ☐ C) 76°
- ☐ D) 75°
- ☐ E) 128°

---

10 Two angles in a triangle are 45° and 95°. What is the third angle?

- ☐ A) 30°
- ☐ B) 140°
- ☐ C) 40°
- ☐ D) 45°
- ☐ E) 220°

---

11 An isosceles triangle has two equal base angles of 32° each. What is the third angle?

- ☐ A) 115°
- ☐ B) 116°
- ☐ C) 296°
- ☐ D) 148°
- ☐ E) 64°

---

12 Two angles in a triangle are 75° and 40°. What is the third angle?

- ☐ A) 75°
- ☐ B) 65°
- ☐ C) 115°
- ☐ D) 245°
- ☐ E) 15°

---

13 In a right-angled triangle one acute angle is 45 degrees. What is the other acute angle?

- ☐ A) 35
- ☐ B) 45
- ☐ C) 55
- ☐ D) 90
- ☐ E) 135

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14 Three angles in a quadrilateral are 50°, 40° and 125°. What is the fourth angle?

- ☐ A) 155°
- ☐ B) 215°
- ☐ C) 135°
- ☐ D) 35°
- ☐ E) 145°

---

15 The angles around a point are x°, x°, 2x°. What is the value of x?

- ☐ A) 180
- ☐ B) 45
- ☐ C) 91
- ☐ D) 90
- ☐ E) 270

---

16 The angles around a point are x°, 2x°, 3x°. What is the size of the smallest angle?

- ☐ A) 61°
- ☐ B) 120°
- ☐ C) 60°
- ☐ D) 59°
- ☐ E) 300°

---

17 The angles around a point are x°, 4x°, 5x°. What is the value of x?

- ☐ A) 72
- ☐ B) 324
- ☐ C) 180
- ☐ D) 36
- ☐ E) 18

---

18 Angles around a point are 165° and 35° and x. What is the size of angle x?

- ☐ A) 150°
- ☐ B) 170°
- ☐ C) 110°
- ☐ D) 200°
- ☐ E) 160°

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19 Two angles on a straight line are 75° and x. What is the size of angle x?

- [ ] A) 285°
- [ ] B) 115°
- [ ] C) 105°
- [ ] D) 15°
- [ ] E) 75°

---

20 Two angles in a triangle are 20° and 35°. What is the third angle?

- [ ] A) 135°
- [ ] B) 305°
- [ ] C) 55°
- [ ] D) 125°
- [ ] E) 70°

---

21 Angles around a point are 85° and 165° and x. What is the size of angle x?

- [ ] A) 110°
- [ ] B) 160°
- [ ] C) 100°
- [ ] D) 250°
- [ ] E) 120°

---

22 Three angles in a quadrilateral are 45°, 50° and 55°. What is the fourth angle?

- [ ] A) 210°
- [ ] B) 30°
- [ ] C) 220°
- [ ] D) 150°
- [ ] E) 265°

---

23 Three angles in a quadrilateral are 75°, 90° and 130°. What is the fourth angle?

- [ ] A) 55°
- [ ] B) 195°
- [ ] C) 65°
- [ ] D) 295°
- [ ] E) 115°

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24 Angles around a point are 95° and 180° and x. What is the size of angle x?

- [ ] A) 95°
- [ ] B) 75°
- [ ] C) 275°
- [ ] D) 85°
- [ ] E) 185°

---

25 Angles around a point are 155°, 35° and 70° and x. What is the size of angle x?

- [ ] A) 100°
- [ ] B) 110°
- [ ] C) 170°
- [ ] D) 260°
- [ ] E) 90°

---

26 An isosceles triangle has an angle of 68° between its two equal sides. What is the size of each of the other two angles?

- [ ] A) 146°
- [ ] B) 55°
- [ ] C) 68°
- [ ] D) 112°
- [ ] E) 56°

---

27 An isosceles triangle has two equal base angles of 24° each. What is the third angle?

- [ ] A) 24°
- [ ] B) 312°
- [ ] C) 48°
- [ ] D) 156°
- [ ] E) 132°

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28 Three angles in a quadrilateral are 100°, 115° and 60°. What is the fourth angle?

- ☐ A) 75°
- ☐ B) 145°
- ☐ C) 95°
- ☐ D) 85°
- ☐ E) 275°

---

29 Three angles in a quadrilateral are 75°, 105° and 55°. What is the fourth angle?

- ☐ A) 55°
- ☐ B) 180°
- ☐ C) 235°
- ☐ D) 135°
- ☐ E) 125°

---

30 The angles on a straight line are 2x°, 3x°, 4x°. What is the size of the largest angle?

- ☐ A) 80°
- ☐ B) 20°
- ☐ C) 79°
- ☐ D) 100°
- ☐ E) 40°

---

31 The angles around a point are x°, 4x°, 5x°. What is the size of the smallest angle?

- ☐ A) 72°
- ☐ B) 36°
- ☐ C) 324°
- ☐ D) 37°
- ☐ E) 120°

---

32 The angles on a straight line are 2x°, 3x°, 4x°. What is the value of x?

- ☐ A) 45
- ☐ B) 19
- ☐ C) 21
- ☐ D) 160
- ☐ E) 20

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33 Angles around a point are 230° and 75° and x. What is the size of angle x?

- [ ] A) 45°
- [ ] B) 305°
- [ ] C) 215°
- [ ] D) 65°
- [ ] E) 55°

---

34 Two angles in a triangle are 40° and 25°. What is the third angle?

- [ ] A) 295°
- [ ] B) 115°
- [ ] C) 50°
- [ ] D) 125°
- [ ] E) 65°

---

35 An isosceles triangle has two equal base angles of 22° each. What is the third angle?

- [ ] A) 137°
- [ ] B) 44°
- [ ] C) 158°
- [ ] D) 136°
- [ ] E) 316°

---

36 Angles on a straight line are 10° and 125° and x. What is the size of angle x?

- [ ] A) 55°
- [ ] B) 225°
- [ ] C) 35°
- [ ] D) 45°
- [ ] E) 135°

---

37 Three angles in a quadrilateral are 100°, 95° and 45°. What is the fourth angle?

- [ ] A) 120°
- [ ] B) 165°
- [ ] C) 110°
- [ ] D) 60°
- [ ] E) 240°

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38 An isosceles triangle has an angle of 98° between its two equal sides. What is the size of each of the other two angles?

- [ ] A) 40°
- [ ] B) 98°
- [ ] C) 82°
- [ ] D) 8°
- [ ] E) 41°

---

39 Angles on a straight line are 30° and 85° and x. What is the size of angle x?

- [ ] A) 245°
- [ ] B) 75°
- [ ] C) 115°
- [ ] D) 65°
- [ ] E) 55°

---

40 The angles around a point are 2x°, 3x°, 4x°. What is the size of the smallest angle?

- [ ] A) 40°
- [ ] B) 120°
- [ ] C) 280°
- [ ] D) 81°
- [ ] E) 80°

---

41 Three angles in a quadrilateral are 80°, 115° and 105°. What is the fourth angle?

- [ ] A) 165°
- [ ] B) 120°
- [ ] C) 60°
- [ ] D) 300°
- [ ] E) 50°

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42 The angles on a straight line are x°, x°, 2x°. What is the value of x?

- [ ] A) 45
- [ ] B) 135
- [ ] C) 46
- [ ] D) 60
- [ ] E) 90

---

43 The angles on a straight line are 2x°, 3x°. What is the size of the largest angle?

- [ ] A) 109°
- [ ] B) 107°
- [ ] C) 72°
- [ ] D) 108°
- [ ] E) 36°

---

44 The angles around a point are 3x°, 4x°, 5x°. What is the size of the smallest angle?

- [ ] A) 150°
- [ ] B) 90°
- [ ] C) 30°
- [ ] D) 270°
- [ ] E) 91°

---

45 The angles around a point are x°, 2x°. What is the size of the smallest angle?

- [ ] A) 60°
- [ ] B) 120°
- [ ] C) 240°
- [ ] D) 180°
- [ ] E) 121°

---

46 The angles around a point are x°, 2x°, 3x°, 4x°. What is the size of the smallest angle?

- [ ] A) 90°
- [ ] B) 144°
- [ ] C) 37°
- [ ] D) 36°
- [ ] E) 324°

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47 The angles on a straight line are x°, x°, 2x°. What is the size of the largest angle?

- [ ] A) 90°
- [ ] B) 180°
- [ ] C) 89°
- [ ] D) 45°
- [ ] E) 60°

---

48 The angles around a point are 2x°, 3x°. What is the size of the largest angle?

- [ ] A) 144°
- [ ] B) 180°
- [ ] C) 72°
- [ ] D) 216°
- [ ] E) 108°

---

49 The angles on a straight line are x°, 5x°. What is the size of the smallest angle?

- [ ] A) 90°
- [ ] B) 60°
- [ ] C) 36°
- [ ] D) 150°
- [ ] E) 30°

---

50 The angles around a point are x°, 4x°, 5x°. What is the size of the largest angle?

- [ ] A) 181°
- [ ] B) 72°
- [ ] C) 90°
- [ ] D) 36°
- [ ] E) 180°

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51 An isosceles triangle has its apex angle equal to 36 degrees. What is the size of each base angle?

- [ ] A) 72
- [ ] B) 82
- [ ] C) 54
- [ ] D) 144
- [ ] E) 36

---

52 Two angles on a straight line are 145° and x. What is the size of angle x?

- [ ] A) 35°
- [ ] B) 215°
- [ ] C) 45°
- [ ] D) 55°
- [ ] E) 145°

---

53 Angles around a point are 115°, 155° and 25° and x. What is the size of angle x?

- [ ] A) 65°
- [ ] B) 205°
- [ ] C) 295°
- [ ] D) 75°
- [ ] E) 55°

---

54 Angles around a point are 90°, 20° and 35° and x. What is the size of angle x?

- [ ] A) 55°
- [ ] B) 215°
- [ ] C) 35°
- [ ] D) 225°
- [ ] E) 145°

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55 Angles on a straight line are 115° and 15° and x. What is the size of angle x?

- ☐ A) 130°
- ☐ B) 40°
- ☐ C) 60°
- ☐ D) 230°
- ☐ E) 50°

---

56 Two angles on a straight line are 130° and x. What is the size of angle x?

- ☐ A) 60°
- ☐ B) 130°
- ☐ C) 50°
- ☐ D) 40°
- ☐ E) 230°

---

57 Give the size of angle C and state a reason for your answer.

(2)

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58 Find the three interior angles of the triangle.

(3)

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Question 1

correct option B (115) cao **B1**

Answer: B) 115 degrees, because 65 + 115 = 180 (straight line). (Answer: 115 degrees.)

Question 2

correct option D (105°) cao **B1**

Answer: D) 105°

Question 3

correct option D (30°) cao **B1**

Answer: D) 30°

Question 4

correct option B (95°) cao **B1**

Answer: B) 95°

Question 5

correct option A (30°) cao **B1**

Answer: A) 30°

Question 6

correct option D (60°) cao **B1**

Answer: D) 60°

Question 7

reference to drawing a parallel through a vertex and using alternate interior angles to show sum 180, or statement 'straight line = 180 and alternate interior angles show two angles add to a straight line' oe **B1**

Answer: Because if a line is drawn through one vertex parallel to the opposite side the two alternate interior angles plus the vertex angle make a straight line (180 degrees).

Question 8

correct option E (55°) cao **B1**

Answer: E) 55°

Question 9

correct option C (76°) cao **B1**

Answer: C) 76°

Question 10

correct option C (40°) cao **B1**

Answer: C) 40°

Question 11

correct option B (116°) cao **B1**

Answer: B) 116°

Question 12

correct option B (65°) cao **B1**

Answer: B) 65°

Question 13

correct option B (45) cao **B1**

Answer: B) 45 degrees (90 - 45 = 45).

Question 14

correct option E (145°) cao **B1**

Answer: E) 145°

Question 15

correct option D (90) cao **B1**

Answer: D) 90

Question 16

correct option C (60°) cao **B1**

Answer: C) 60°

Question 17

correct option D (36) cao **B1**

Answer: D) 36

Question 18

correct option E (160°) cao **B1**

Answer: E) 160°

Question 19

correct option C (105°) cao **B1**

Answer: C) 105°

Question 20

correct option D (125°) cao **B1**

Answer: D) 125°

Question 21

correct option A (110°) cao **B1**

Answer: A) 110°

Question 22

correct option A (210°) cao **B1**

Answer: A) 210°

Question 23

correct option C (65°) cao **B1**

Answer: C) 65°

Question 24

correct option D (85°) cao **B1**

Answer: D) 85°

Question 25

correct option A (100°) cao **B1**

Answer: A) 100°

Question 26

correct option E (56°) cao **B1**

Answer: E) 56°

Question 27

correct option E (132°) cao **B1**

Answer: E) 132°

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Question 28

correct option D (85°) cao **B1**

Answer: D) 85°

Question 29

correct option E (125°) cao **B1**

Answer: E) 125°

Question 30

correct option A (80°) cao **B1**

Answer: A) 80°

Question 31

correct option B (36°) cao **B1**

Answer: B) 36°

Question 32

correct option E (20) cao **B1**

Answer: E) 20

Question 33

correct option E (55°) cao **B1**

Answer: E) 55°

Question 34

correct option B (115°) cao **B1**

Answer: B) 115°

Question 35

correct option D (136°) cao **B1**

Answer: D) 136°

Question 36

correct option D (45°) cao **B1**

Answer: D) 45°

Question 37

correct option A (120°) cao **B1**

Answer: A) 120°

Question 38

correct option E (41°) cao **B1**

Answer: E) 41°

Question 39

correct option D (65°) cao **B1**

Answer: D) 65°

Question 40

correct option E (80°) cao **B1**

Answer: E) 80°

Question 41

correct option C (60°) cao **B1**

Answer: C) 60°

Question 42

correct option A (45) cao **B1**

Answer: A) 45

Question 43

correct option D (108°) cao **B1**

Answer: D) 108°

Question 44

correct option B (90°) cao **B1**

Answer: B) 90°

Question 45

correct option B (120°) cao **B1**

Answer: B) 120°

Question 46

correct option D (36°) cao **B1**

Answer: D) 36°

Question 47

correct option A (90°) cao **B1**

Answer: A) 90°

Question 48

correct option D (216°) cao **B1**

Answer: D) 216°

Question 49

correct option E (30°) cao **B1**

Answer: E) 30°

Question 50

correct option E (180°) cao **B1**

Answer: E) 180°

Question 51

correct option A (72) cao **B1**

Answer: A) 72 degrees ((180 - 36)/2 = 72).

Question 52

correct option A (35°) cao **B1**

Answer: A) 35°

Question 53

correct option A (65°) cao **B1**

Answer: A) 65°

Question 54

correct option B (215°) cao **B1**

Answer: B) 215°

Question 55

correct option E (50°) cao **B1**

Answer: E) 50°

Question 56

correct option C (50°) cao **B1**

Answer: C) 50°

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Question 57

Angle C = 58 degrees cao	**B1**
reason: angles opposite equal sides are equal (or 'base angles are equal')	**B1**

Answer: Angle C = 58 degrees. Reason: angles opposite equal sides are equal (base angles equal in an isosceles triangle).

Question 58

use exterior angle = sum of opposite interior angles and set up equations (let base angle = b, vertex = v and use v + b = 110 and v + 2b = 180 or equivalent)	**M1**
solve to find b = 70 and v = 40 (or show correct substitution)	**M1**
angles 40, 70, 70 degrees cao	**A1**

Answer: Angles are 40 degrees (vertex), 70 degrees and 70 degrees (base angles).

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