4.1 Geometry: Angles and Shapes: Test Pack

Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State whether an angle of 152 degrees is acute, right angle, obtuse, straight or reflex.

(1)

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2 Two parallel lines are cut by a transversal. One of the co-interior (allied) angles is 64 degrees. Work out the other co-interior angle.

(2)

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3 The three angles of a triangle are (2x + 15) degrees, (3x - 5) degrees and (x + 20) degrees. Find x, and hence work out the size of the largest angle in the triangle.

(3)

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4 Write down the number of lines of symmetry of a regular pentagon.

(1)

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5 Answer the following about quadrilaterals and their properties.

(a) A quadrilateral has exactly one pair of parallel sides and no equal angles. Name this quadrilateral. **(1)**

(b) A different quadrilateral has all four sides equal in length but no right angles. Name this quadrilateral and state its number of lines of symmetry. **(2)**

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6 For each shape, state the number of lines of symmetry and the order of rotational symmetry.

(a) A square **(2)**

(b) An isosceles triangle that is not equilateral **(2)**

(c) A regular pentagon **(2)**

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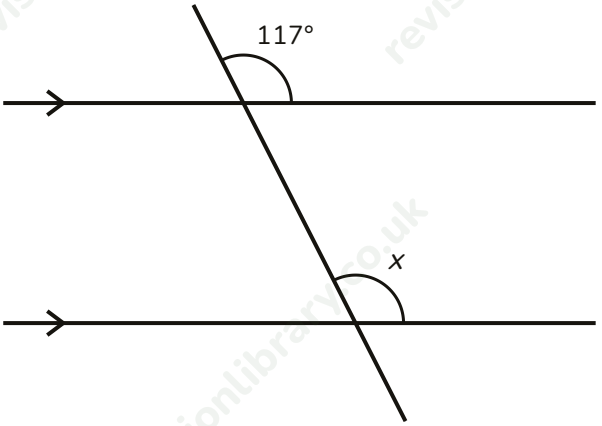
7 Sumaya says that regular pentagons will tessellate (fit together with no gaps or overlaps) because 360 is close to a multiple of their interior angle.

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

(b) Determine, with a reason, whether Sumaya is correct. **(2)**

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8 Two parallel lines are crossed by a third straight line. One angle is 117°. 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.

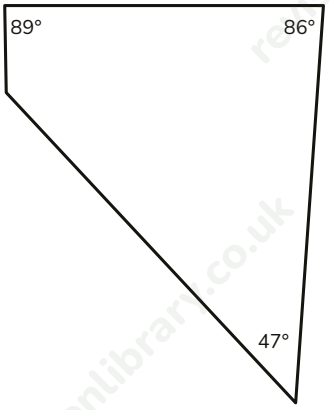


(3)

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9 Three angles of a quadrilateral are 89°, 86° and 47°. Work out the fourth angle.

Diagram NOT accurately drawn



(2)

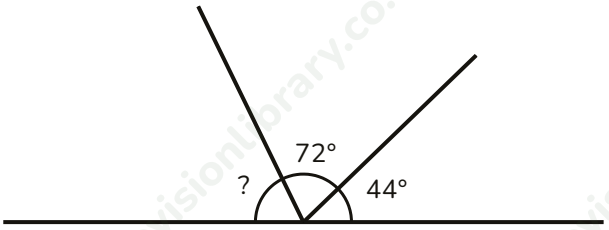
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10 A quadrilateral has no right angles and 2 lines of symmetry.
Write down the mathematical name of the quadrilateral.

(1)

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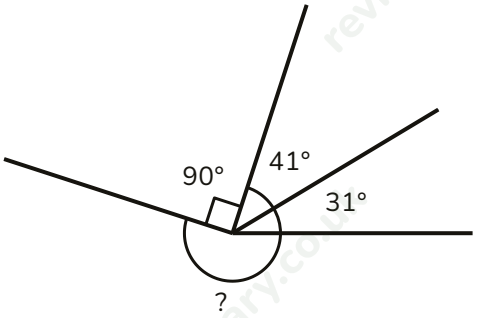
11 Three angles meet on a straight line. Two of them are 44° and 72°. Work out the third angle.



(2)

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12 Four angles meet at a point. Three of them are 31°, 41° and 90°. Work out the fourth angle. Give a reason for your answer.

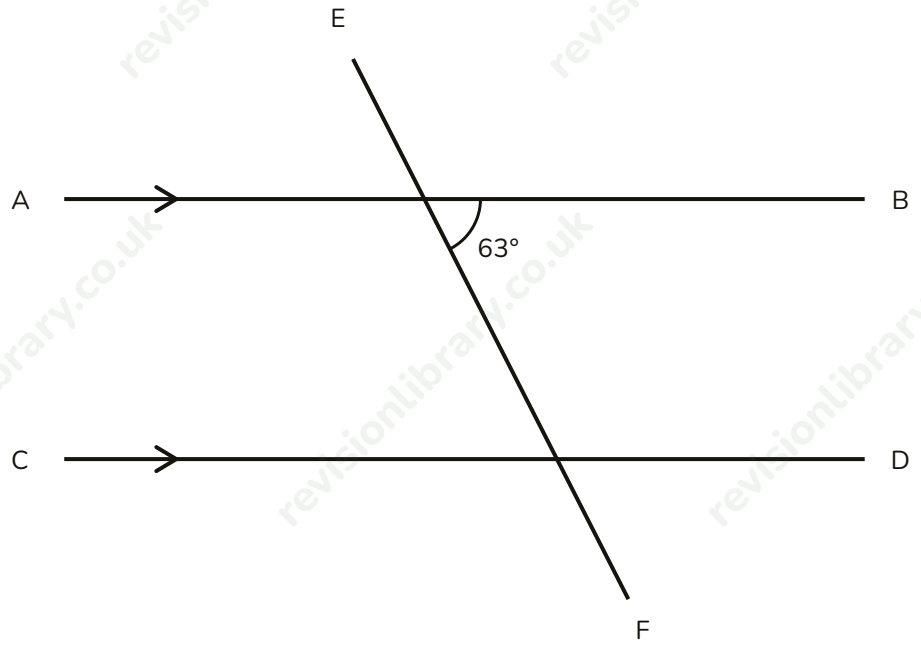


(3)

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13 Lines AB and CD are parallel, cut by a transversal EF. One angle formed at the intersection with AB is 63 degrees.

Diagram NOT accurately drawn



(a) Write down the size of the corresponding angle at the intersection with CD, giving a reason. **(2)**

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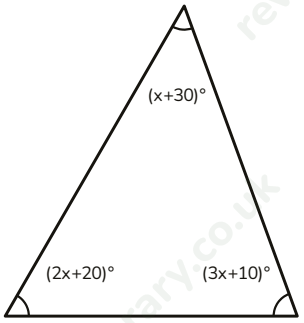
(b) Write down the size of the alternate angle at the intersection with CD, giving a reason. **(2)**

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14 The three angles of a triangle are (2x + 20) degrees, (3x + 10) degrees and (x + 30) degrees.

Diagram NOT accurately drawn



(a) Show that 6x + 60 = 180. **(2)**

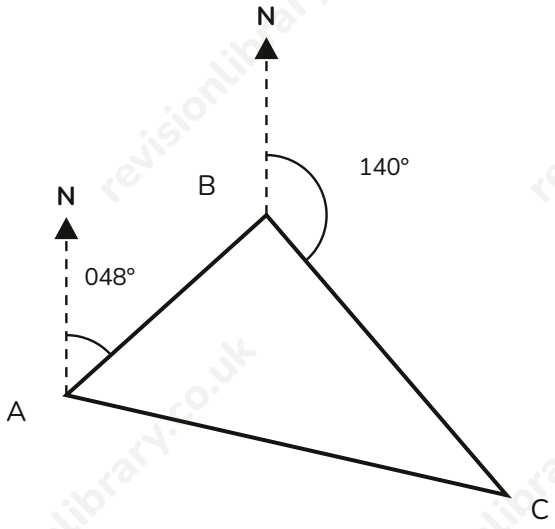
(b) Solve the equation to find x, and hence work out the size of the largest angle in the triangle. **(3)**

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15 A boat sails from point A to point B on a bearing of 048 degrees. At B, the boat changes course and sails to point C on a bearing of 140 degrees. Points A, B and C form a triangle.

Diagram NOT accurately drawn



(a) State the bearing of A from B. **(1)**

(b) Hence work out angle ABC, the interior angle of the triangle at B, using the bearing of C from B (140 degrees). **(2)**

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(c) Given that angle BAC = 55 degrees, work out angle ACB. **(2)**

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Mark scheme · 4.1 Geometry: Angles and Shapes: Test Pack

Question 1

obtuse cao — **B1**

Answer: **obtuse**

Question 2

recognise co-interior angles sum to 180 — **M1**

116 cao — **A1**

Answer: **116 degrees**

Question 3

form the equation (2x+15) + (3x-5) + (x+20) = 180, i.e. 6x + 30 = 180 — **M1**

solve to get x = 25 — **M1**

largest angle 70 degrees cao — **A1**

Answer: **x = 25; largest angle = 70 degrees**

Question 4

5 cao — **B1**

Answer: **5**

Question 5

(a) trapezium — **B1**

(a) Answer: **Trapezium**

(b) rhombus — **B1**

(b) 2 lines of symmetry — **B1**

(b) Answer: **Rhombus, 2 lines of symmetry**

Question 6

(a) 4 lines of symmetry — **B1**

(a) rotational symmetry of order 4 — **B1**

(a) Answer: **4 lines of symmetry, order 4**

(b) 1 line of symmetry — **B1**

(b) rotational symmetry of order 1 — **B1**

(b) Answer: **1 line of symmetry, order 1**

(c) 5 lines of symmetry — **B1**

(c) rotational symmetry of order 5 — **B1**

(c) Answer: **5 lines of symmetry, order 5**

Question 7

(a) (5 - 2) x 180 / 5 oe — **M1**

(a) 108 cao — **A1**

(a) Answer: **108 degrees**

(b) no, Sumaya is not correct — **B1**

(b) correct reason, e.g. 360 / 108 = 3.33 (not a whole number), so a whole number of pentagons cannot meet exactly at a point, leaving a gap — **B1**

(b) Answer: **No, Sumaya is not correct: 360 / 108 is not a whole number, so regular pentagons alone cannot tessellate**

Question 8

correct angle fact identified — **M1**

117° cao — **A1**

corresponding angles are equal — **B1**

Answer: **117° (corresponding angles are equal)**

Question 9

360 - 89 - 86 - 47 or 360 - 222 — **M1**

138° cao — **A1**

Answer: **138°**

Question 10

rhombus cao — **B1**

Answer: **rhombus**

Question 11

180 - 44 - 72 or 180 - 116 — **M1**

64° cao — **A1**

Answer: **64°**

Question 12

360 - 31 - 41 - 90 or 360 - 162 — **M1**

198° cao — **A1**

angles around a point add up to 360 degrees — **B1**

Answer: **198° (angles around a point add up to 360°)**

Question 13

(a) 63 degrees — **B1**

(a) reason: corresponding angles on parallel lines are equal — **B1**

(a) Answer: **63 degrees**

(b) 63 degrees — **B1**

(b) reason: alternate angles on parallel lines are equal — **B1**

(b) Answer: **63 degrees**

Question 14

(a) (2x + 20) + (3x + 10) + (x + 30) = 180 set up, using angle sum of a triangle — **M1**

(a) cso: correctly simplified to 6x + 60 = 180 — **A1**

(a) Answer: **6x + 60 = 180 (shown)**

(b) 6x = 120 — **M1**

(b) x = 20 — **A1**

(b) largest angle = 70 degrees, ft from their x — **A1**

(b) Answer: **x = 20, largest angle = 70 degrees**

Question 15

(a) 228 cao — **B1**

(a) Answer: **228 degrees**

(b) 228 - 140 oe, ft from part (a) — **M1**

(b) angle ABC = 88 cao — **A1**

(b) Answer: **Angle ABC = 88 degrees**

(c) 180 - 55 - 88 oe, ft from part (b) — **M1**

(c) angle ACB = 37 cao — **A1**

(c) Answer: **Angle ACB = 37 degrees**

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