4.1 Geometry: Angles and Shapes: 1-hour Pack

Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A kite has one pair of equal angles of 108 degrees each. Work out the size of each of the other pair of equal angles.

(3)

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2 Lines AB and CD are parallel, cut by a transversal EF. Angle P, where the transversal meets AB, is 115 degrees. Angle Q, at AB, is vertically opposite angle P. Angle R, at CD, is alternate to angle P. Angle S, at CD, is co-interior to angle P. Work out angles Q, R and S.

(3)

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3 The interior angle of a regular polygon is 165 degrees.

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

.....

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

.....

(c) Work out the sum of the interior angles of this polygon. **(1)**

.....

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4 Two parallel lines are cut by a transversal. One angle is 84 degrees. Write down the size of its corresponding angle.

(1)

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5 A straight line is split into three angles: 35 degrees, 68 degrees and x. Work out x.

(2)

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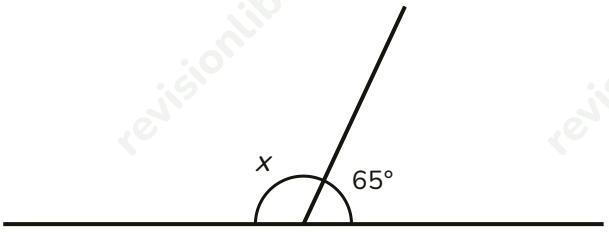
6 Four angles meet at a point. Three of the angles are 82 degrees, 77 degrees and 95 degrees. Work out the fourth angle, x.

(2)

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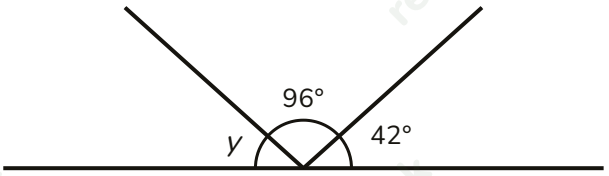
7 Angles on a straight line always add up to 180 degrees.

(a) A straight line is split into two angles by a ray. One angle is 65 degrees. Work out the size of the other angle, x. **(2)**



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(b) A straight line is split into three angles: 42 degrees, 96 degrees and y degrees. Work out y. **(2)**

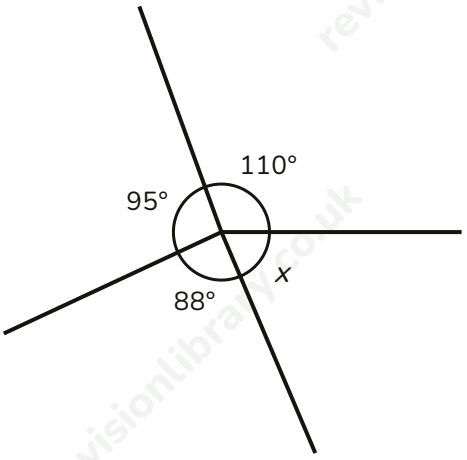


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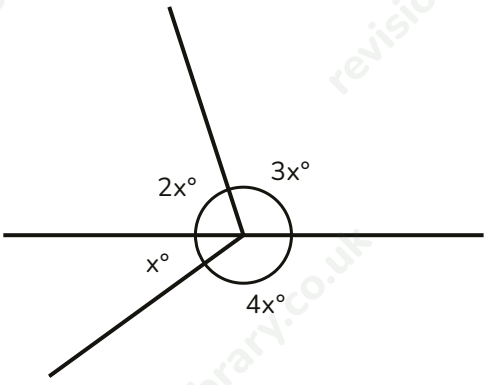
8 Angles that meet at a single point always add up to 360 degrees.

(a) Four angles meet at a point. Three of the angles are 110 degrees, 95 degrees and 88 degrees. Work out the fourth angle, x. **(2)**



.....

(b) At a different point, four angles of 3x, 2x, x and 4x degrees meet, with no other angles present. Find x, and hence work out the size of the largest angle. **(3)**



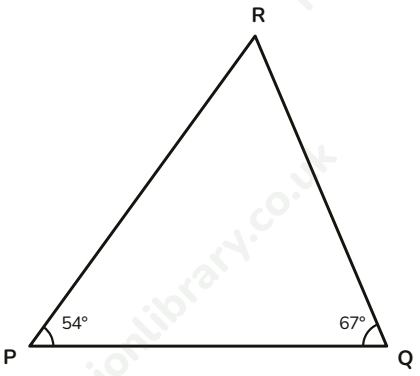
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9 The angles in any triangle add up to 180 degrees.

(a) In triangle PQR, angle P = 54 degrees and angle Q = 67 degrees. Work out angle R. **(2)**

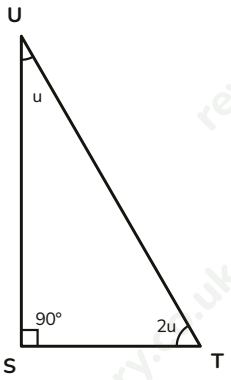
Diagram NOT accurately drawn



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(b) Triangle STU is right angled at S. Angle T is twice the size of angle U. Work out angle U. **(3)**

Diagram NOT accurately drawn



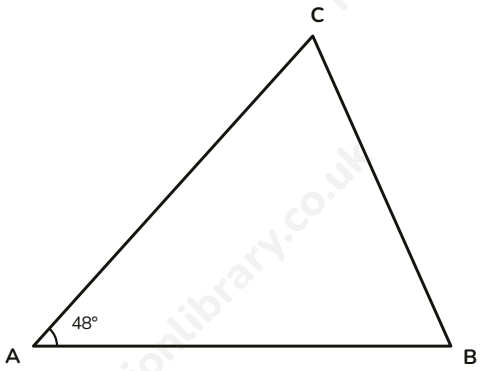
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10 In an isosceles triangle, the two base angles are equal.

(a) Triangle ABC is isosceles with AB = AC. Angle BAC = 48 degrees. Work out angle ABC. **(2)**

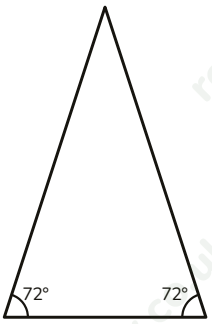
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(b) A different isosceles triangle has a base angle of 72 degrees. Work out the size of the apex angle. **(2)**

Diagram NOT accurately drawn



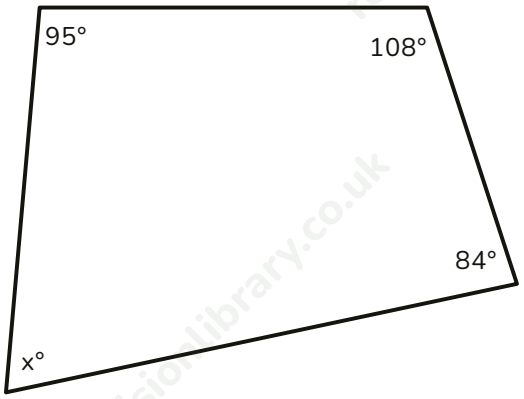
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11 The angles in any quadrilateral add up to 360 degrees.

(a) A quadrilateral has angles of 95 degrees, 108 degrees, 84 degrees and x degrees. Work out x. **(2)**

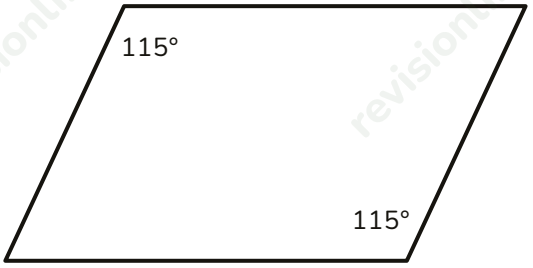
Diagram NOT accurately drawn



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(b) A parallelogram has one pair of opposite angles of 115 degrees each. Work out the size of each of the other pair of opposite angles. **(2)**

Diagram NOT accurately drawn

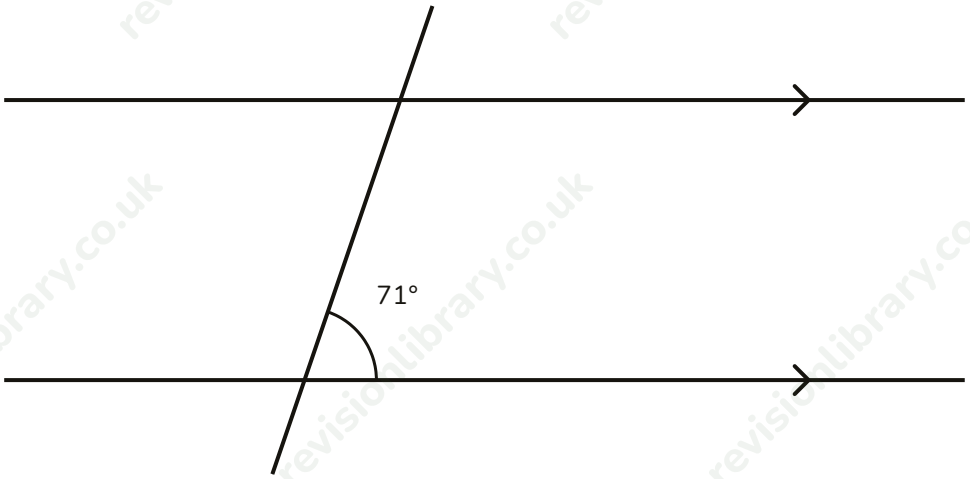


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12 Two parallel lines are cut by a transversal. One of the co-interior (allied) angles is 71 degrees.

Diagram NOT accurately drawn



(a) Work out the other co-interior angle. **(2)**

.....

(b) Explain why co-interior angles between parallel lines always sum to 180 degrees. **(1)**

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13 The sum of the interior angles of a polygon with n sides is given by (n - 2) x 180 degrees.

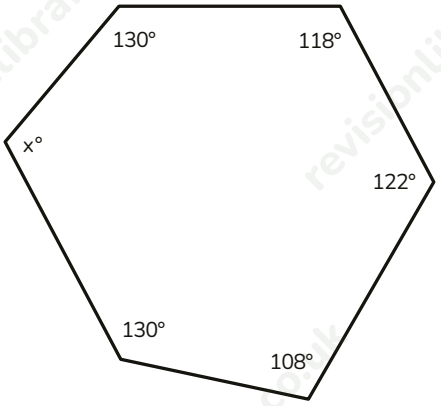
(a) Use the formula to work out the sum of the interior angles of a hexagon. **(2)**

Diagram NOT accurately drawn



(b) A hexagon has interior angles 130, 118, 122, 108, 130 and x degrees. **(2)**
Work out x.

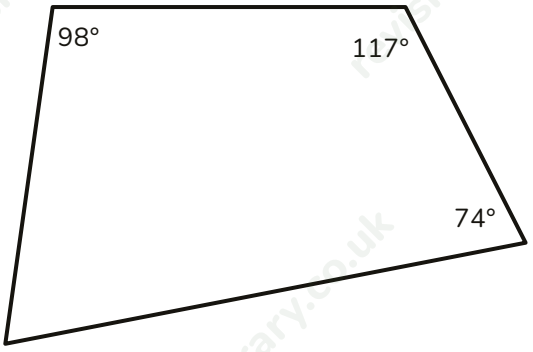
Diagram NOT accurately drawn



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14 Three angles of a quadrilateral are 98°, 117° and 74°. Work out the fourth angle and say whether the quadrilateral could be a parallelogram.

Diagram NOT accurately drawn



(3)

15 A quadrilateral has 2 pairs of parallel sides, no right angles and diagonals that cross at right angles.
Write down the mathematical name of the quadrilateral.

(1)

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Mark scheme · 4.1 Geometry: Angles and Shapes: 1-hour Pack

Question 1

form 360 - 2(108) or equivalent method	M1
correctly evaluate 360 - 216 = 144	M1
72 cao	A1

Answer: **72 degrees**

Question 2

Q = 115 (vertically opposite angles are equal)	B1
R = 115 (alternate angles between parallel lines are equal)	B1
S = 65 (co-interior angles between parallel lines sum to 180)	B1

Answer: **Q = 115 degrees, R = 115 degrees, S = 65 degrees**

Question 3

(a) 15 cao	B1

(a) Answer: **15 degrees**

(b) 360 / 15 or equivalent method	M1
(b) 24 cao	A1

(b) Answer: **24**

(c) 3960 cao	B1

(c) Answer: **3960 degrees**

Question 4

84 cao	B1

Answer: **84 degrees**

Question 5

set up 180 - 35 - 68 or equivalent method	M1
77 cao	A1

Answer: **77 degrees**

Question 6

set up 360 - 82 - 77 - 95 or equivalent method	M1
106 cao	A1

Answer: **106 degrees**

Question 7

(a) 180 - 65 oe	M1
(a) x = 115 cao	A1

(a) Answer: **x = 115 degrees**

(b) 180 - 42 - 96 oe	M1
(b) y = 42 cao	A1

(b) Answer: **y = 42 degrees**

Question 8

(a) 360 - 110 - 95 - 88 oe	M1
(a) x = 67 cao	A1

(a) Answer: **x = 67 degrees**

(b) 3x + 2x + x + 4x = 360, i.e. 10x = 360	M1
(b) x = 36	A1
(b) largest angle = 144, ft from their x	A1

(b) Answer: **x = 36, largest angle = 144 degrees**

Question 9

(a) 180 - 54 - 67 oe	M1
(a) angle R = 59 cao	A1

(a) Answer: **Angle R = 59 degrees**

(b) angle T + angle U = 90 (since angle S = 90)	M1
(b) 2u + u = 90 oe, using T = 2U	M1
(b) angle U = 30 cao	A1

(b) Answer: **Angle U = 30 degrees**

Question 10

(a) (180 - 48) / 2 oe	M1
(a) angle ABC = 66 cao	A1

(a) Answer: **Angle ABC = 66 degrees**

(b) 180 - 72 - 72 oe	M1
(b) apex angle = 36 cao	A1

(b) Answer: **Apex angle = 36 degrees**

Question 11

(a) 360 - 95 - 108 - 84 oe	M1
(a) x = 73 cao	A1

(a) Answer: **x = 73 degrees**

(b) (360 - 2 x 115) / 2 oe	M1
(b) 65 cao	A1

(b) Answer: **65 degrees each**

Question 12

(a) 180 - 71 oe	M1
(a) 109 cao	A1

(a) Answer: **109 degrees**

(b) correct explanation, e.g. the co-interior angle is supplementary to the corresponding angle, and the corresponding angle sits on a straight line with the other co-interior angle, so together they total 180 degrees	B1

(b) Answer: **A co-interior angle and the corresponding angle to its partner lie on a straight line together, and a straight line totals 180 degrees, so co-interior angles are supplementary**

Question 13

(a) (6 - 2) x 180 oe	M1
(a) 720 cao	A1

(a) Answer: **720 degrees**

(b) 720 - 130 - 118 - 122 - 108 - 130 oe, ft from part (a)	M1
(b) x = 112 cao	A1

(b) Answer: **x = 112 degrees**

Question 14

360 - 289	M1
71°	A1
concludes it cannot be a parallelogram because opposite angles must be equal and no two angles are equal	B1

Answer: **71°; it cannot be a parallelogram**

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Question 15

rhombus cao **B1**

Answer: **rhombus**

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