4.5 Properties of 2D Shapes: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Name the shape with 3 straight sides and 3 angles.

(1)

2 Draw a regular hexagon. State how many lines of symmetry it has.

(2)

3 A regular pentagon has internal angle 108 degrees. Explain briefly why all internal angles are 108 degrees.

(2)

4 Classify this quadrilateral: it has one pair of parallel sides, opposite sides not equal, and no right angles. Give the name of the quadrilateral and a brief reason.

(2)

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5 A regular hexagon is a six sided polygon. Work out its interior angle and state how many lines of symmetry a regular hexagon has.

(3)

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6 In a quadrilateral the angles are 85 degrees, 95 degrees, x degrees and y degrees. Given that x = y, find x and y.

(3)

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7 A triangle has angles 50° and 32°. 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)

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8 Write down (a) the number of lines of symmetry and (b) the order of rotational symmetry of a equilateral triangle.

(2)

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9 A triangle has angles 90° and 75°. 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)

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10 A triangle has angles 32° and 50°. 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)

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11 What is the name of a polygon with 7 sides?

(1)

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12 A quadrilateral has two pairs of adjacent equal sides (but not all four sides equal) and diagonals that cross at right angles.
Write down the mathematical name of the quadrilateral.

(1)

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13 A square is a quadrilateral with four equal sides and four right angles. How many of its interior angles are right angles?

(1)

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14 A quadrilateral has opposite sides equal, four right angles and diagonals that do not cross at right angles.
Write down the mathematical name of the quadrilateral.

(1)

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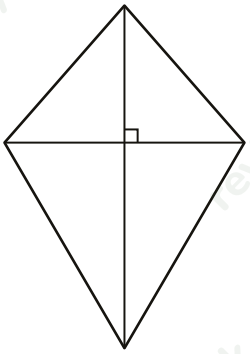
15 A triangle has angles 92° and 63°. Work out the third angle and describe the triangle using the words equilateral, isosceles or scalene, and acute-angled, right-angled or obtuse-angled.

(3)

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16 A kite has diagonals of length 14 cm and 20 cm, meeting at right angles. Calculate the area of the kite.

Diagram NOT accurately drawn



Horizontal diagonal = 14 cm

Vertical diagonal = 20 cm

(2)

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17 Triangle GHI is isosceles with GH = HI. Angle GHI (the angle between the equal sides) is 36 degrees. Find angles HGI and HIG.

(3)

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18 Stretch question. A regular polygon has an interior angle that is 8 times the size of its exterior angle. Work out the number of sides of the polygon.

(4)

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19 Give the missing interior angle of a triangle. The other two angles are 72 degrees and 55 degrees.

(2)

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20 Triangle DEF is isosceles with DE = DF. Angle DEF is 48 degrees. Find angles DFE and EDF.

(2)

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Mark scheme · 4.5 Properties of 2D Shapes: Test Pack

Question 1

triangle cao — **B1**

Answer: **triangle**

Question 2

reasonable regular hexagon drawn with six equal sides and roughly equal angles — **M1**

6 lines of symmetry for a regular hexagon stated cao — **A1**

Answer: **6**

Question 3

states regular means all sides and angles equal or states interior angle formula for n-gon = (n-2)*180/n oe — **M1**

substitutes n = 5 to get 540/5 = 108 degrees cao — **A1**

Answer: **Because regular means all angles equal and (5-2)*180/5 = 540/5 = 108 degrees**

Question 4

identifies trapezium or says trapezium cao — **B1**

gives reason: one pair of parallel sides oe — **B1**

Answer: **trapezium**

Question 5

uses interior angle formula (n-2)*180/n or states it oe — **M1**

calculates (6-2)*180/6 = 720/6 = 120 oe — **M1**

states 6 lines of symmetry for a regular hexagon cao — **A1**

Answer: **interior angle 120 degrees; 6 lines of symmetry**

Question 6

uses sum of angles 360 and computes 85 + 95 = 180 so x + y = 180 oe — **M1**

uses x = y to set 2x = 180 or similar oe — **M1**

x = 90 degrees, y = 90 degrees cao — **A1**

Answer: **x = 90 degrees; y = 90 degrees**

Question 7

180 - 50 - 32 — **M1**

98° — **A1**

scalene and obtuse-angled — **B1**

Answer: **98°; scalene, obtuse-angled**

Question 8

(a) 3 — **B1**

(b) 3 — **B1**

Answer: **(a) 3, (b) 3**

Question 9

180 - 90 - 75 — **M1**

15° — **A1**

scalene and right-angled — **B1**

Answer: **15°; scalene, right-angled**

Question 10

180 - 32 - 50 — **M1**

98° — **A1**

scalene and obtuse-angled — **B1**

Answer: **98°; scalene, obtuse-angled**

Question 11

heptagon cao — **B1**

Answer: **heptagon**

Question 12

kite cao — **B1**

Answer: **kite**

Question 13

4 cao — **B1**

Answer: **4**

Question 14

rectangle cao — **B1**

Answer: **rectangle**

Question 15

180 - 92 - 63 — **M1**

25° — **A1**

scalene and obtuse-angled — **B1**

Answer: **25°; scalene, obtuse-angled**

Question 16

uses area of kite = (d1 x d2) / 2 — **M1**

140 cm² cao — **A1**

Answer: **140 cm^2**

Question 17

recognises base angles HGI and HIG are equal — **M1**

uses 180 - 36 = 144 then divides by 2 — **M1**

angle HGI = angle HIG = 72 degrees cao — **A1**

Answer: **72 degrees each**

Question 18

uses interior + exterior = 180 with interior = 8 x exterior — **M1**

forms 9 x exterior = 180 — **M1**

exterior = 20 degrees — **M1**

number of sides = 360 / 20 = 18 cao — **A1**

Answer: **18 sides**

Question 19

uses angle sum of a triangle = 180 oe — **M1**

53 degrees cao — **A1**

Answer: **53 degrees**

Question 20

uses base angles equal (DE = DF so angle DEF = angle DFE): angle DFE = 48 degrees — **M1**

angle EDF = 84 degrees cao — **A1**

Answer: **Angle DFE = 48 degrees, angle EDF = 84 degrees**

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