

Number-Shape Practice

Diagrams, patterns and grids · Calculator allowed

Name: _____ Date: _____ Total: **26 marks**

Instructions

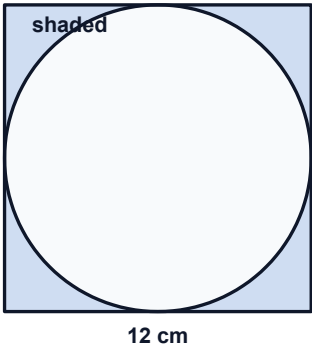
- Answer all questions in the spaces provided.
- Show all working. Marks may be awarded for method.
- Diagrams are not drawn to scale.
- Calculators may be used unless a question says otherwise.

1

Shaded regions

3 marks

A circle is drawn inside a square of side 12 cm so that it touches all four sides. Work out the area of the shaded region. Give your answer in terms of π .

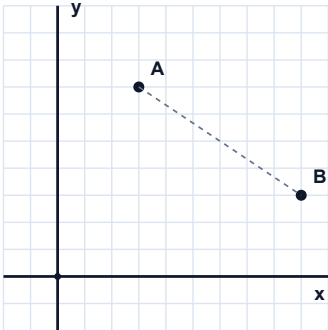


2

Midpoints

2 marks

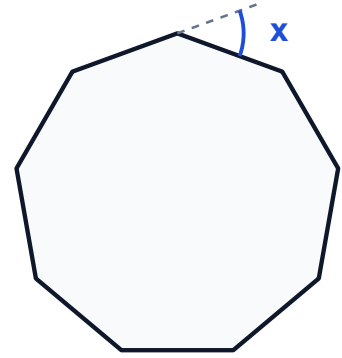
A is the point (3, 7) and B is the point (9, 3). Work out the coordinates of the midpoint of AB.



3 Angles in polygons

2 marks

Work out the size of an exterior angle of a regular polygon with 9 sides.



4 Matchstick patterns

3 marks

A pattern of squares is made from matchsticks. Figure 1 uses 4 matchsticks, Figure 2 uses 7 and Figure 3 uses 10.

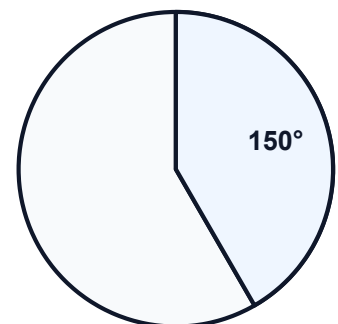
- (a) How many matchsticks are used in Figure 5?
 (b) Write an expression, in terms of n , for the number of matchsticks in Figure n .



5 Pie charts

2 marks

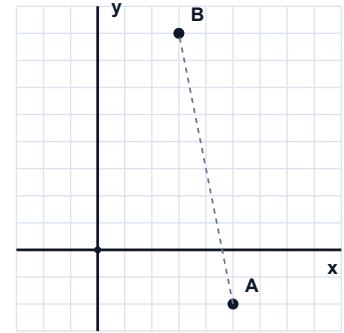
The pie chart shows the pets owned by 84 students. The sector for a cat has an angle of 150° . Work out the number of students who own a cat.



6 Midpoints

2 marks

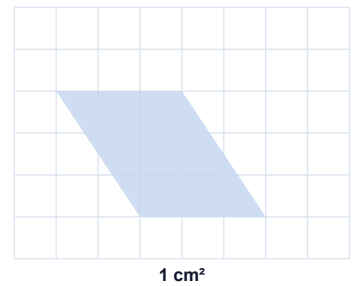
A is the point $(5, -2)$ and B is the point $(3, 8)$. Work out the coordinates of the midpoint of AB.



7 Area on a grid

3 marks

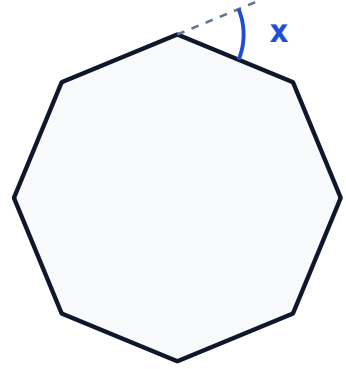
The shape is drawn on a square grid. Each small square is 1 cm by 1 cm. Work out the area of the shape.



8 Angles in polygons

3 marks

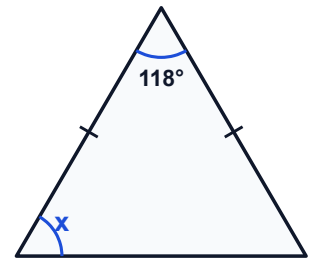
Work out the size of an interior angle of a regular polygon with 8 sides.



9 Angles in triangles

3 marks

The diagram shows an isosceles triangle. The apex angle is 118° . Work out the size of one of the two equal base angles.



10 Shaded regions

3 marks

A circle is drawn inside a square of side 14 cm so that it touches all four sides. Work out the area of the shaded region. Give your answer in terms of π .

