PEARSON EDEXCEL INTERNATIONAL GCSE MATHEMATICS A (4MA1) · HIGHER TIER

Quadrilaterals and Symmetry: exam questions

10 questions · 27 marks · mark schemes at the end

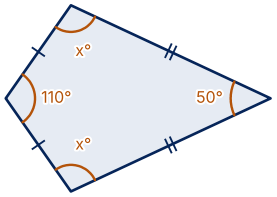
Name _____ Date _____ Score / 27

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/quadrilaterals-and-symmetry

1. **2 marks**

A kite has angles $110°$, $x°$, $50°$ and $x°$.

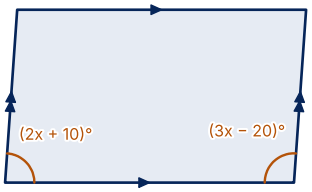
Work out the value of x.



2. **3 marks**

Two angles next to each other in a parallelogram are $(2x + 10)°$ and $(3x - 20)°$.

Work out the size of each angle.



3. **2 marks**

For a regular hexagon, write down

(a) the number of lines of symmetry **(1)**

(b) the order of rotational symmetry. **(1)**

4. **3 marks**

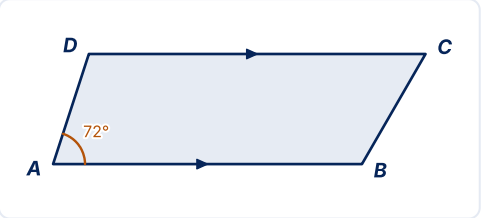
The diagonals of a rhombus are 10 cm and 24 cm long.

Work out the perimeter of the rhombus.

5. **3 marks**

$ABCD$ is a trapezium with AB parallel to DC. Angle $DAB = 72°$ and angle ABC is twice angle BCD.

Work out the sizes of angles ADC, ABC and BCD.



6. **2 marks**

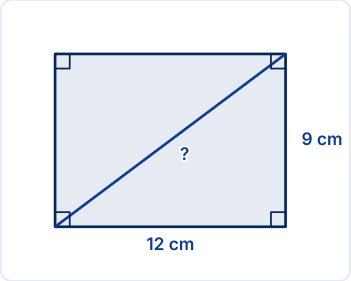
Name the quadrilateral described.

(a) Its diagonals are equal in length and cross at right angles, and it has four lines of symmetry. **(1)**

(b) It has exactly one pair of parallel sides. **(1)**

7. **4 marks**

A rectangle is 12 cm long and 9 cm wide.



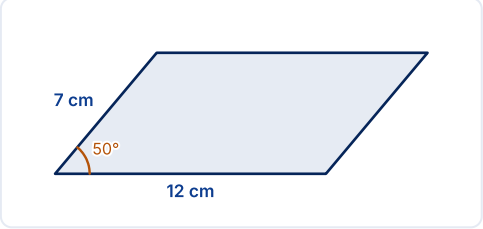
(a) Work out the length of a diagonal. **(2)**

(b) Work out the angle between a diagonal and a longer side. **(2)**

8. **2 marks**

A parallelogram has sides of 12 cm and 7 cm. The angle between them is $50°$.

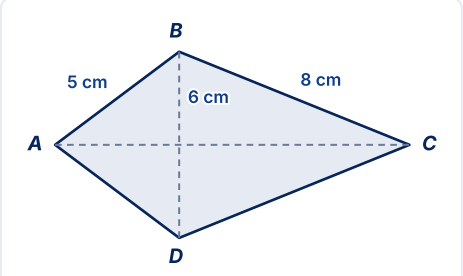
Work out the area of the parallelogram.



9. **4 marks**

$ABCD$ is a kite with $AB = AD = 5$ cm and $CB = CD = 8$ cm. The diagonal BD is 6 cm.

Work out the length of the diagonal AC. Give your answer correct to 3 significant figures.



10. **2 marks**

(a) A quadrilateral has rotational symmetry of order 2 and no lines of symmetry. Name the quadrilateral. **(1)**

(b) How many lines of symmetry does a rhombus that is not a square have? **(1)**

Answers and worked solutions

Question 1 — 2 marks

M1 $2x = 360 - 160$

A1 $x = 100$

Answer: $x = 100$

Question 2 — 3 marks

M1 $2x + 10 + 3x - 20 = 180$

A1 $x = 38$

A1 $86°$ and $94°$

Answer: $86°$ and $94°$

Question 3 — 2 marks

(a)

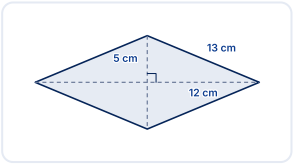
B1 6

(b)

B1 6

Answer: (a) 6; (b) 6

Question 4 — 3 marks



M1 the diagonals bisect at right angles: half-lengths 5 cm and 12 cm

M1 side $\sqrt{5^2 + 12^2} = 13$ cm

A1 52 cm

Answer: 52 cm

Question 5 — 3 marks

B1 angle $ADC = 108°$ (co-interior angles add to $180°$)

M1 $2y + y = 180$

A1 angle $BCD = 60°$, angle $ABC = 120°$

Answer: $108°$, $120°$, $60°$

Question 6 — 2 marks

(a)

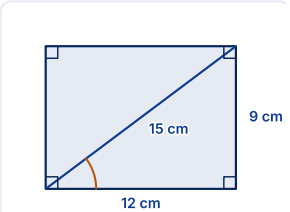
B1 square

(b)

B1 trapezium

Answer: (a) square; (b) trapezium

Question 7 — 4 marks



(a)

M1 $\sqrt{12^2 + 9^2}$

A1 15 cm

(b)

M1 $\tan^{-1}\left(\frac{9}{12}\right)$

A1 $36.9°$

Answer: (a) 15 cm; (b) $36.9°$

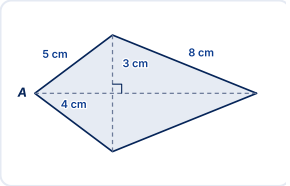
Question 8 — 2 marks

M1 $12 \times 7 \times \sin 50°$

A1 $64.3\,\text{cm}^2$

Answer: $64.3\,\text{cm}^2$

Question 9 — 4 marks



M1 the diagonals cross at right angles at M, the midpoint of BD, with $BM = 3$ cm

M1 $AM = \sqrt{5^2 - 3^2} = 4$

M1 $CM = \sqrt{8^2 - 3^2} = \sqrt{55}$

A1 $4 + 7.416\ldots = 11.4$ cm

Answer: 11.4 cm

Question 10 — 2 marks

(a)

B1 parallelogram

(b)

B1 2

Answer: (a) parallelogram; (b) 2

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/quadrilaterals-and-symmetry
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