

Exercise walk-through

4.2.3

Plane Area

AQA · GCSE · Mathematics

80. Circle parts and geometric definitions · Foundation

Circle parts and geometric definitions · Foundation

For centre O and radius 5 cm, every circumference point is 5 cm from O and the diameter is 10 cm. A chord 3 cm from O has half-length $\sqrt{(5^2-3^2)}=4$ cm, so its whole length is 8 cm. The perpendicular from O meets the chord at its midpoint. Joining the two chord endpoints to O creates a sector; the smaller region between chord and arc is a segment. At the rightmost circumference point, the vertical touching line is tangent and the horizontal radius is perpendicular to it. The circumference is a length, $2\pi r=10\pi$ cm, rather than an area.

125. Areas, perimeters and composite plane shapes · Foundation

Areas, perimeters and composite plane shapes · Foundation

A triangle with base 8 cm and height 5 cm has area 20 cm^2 ; a parallelogram with the same base/height has area 40 cm^2 . A trapezium with parallel sides 6 and 10 cm and height 4 cm has area $(6+10) \times 4 / 2 = 32 \text{ cm}^2$. A rectangular 8 by 6 cm sheet with a 3 by 2 cm corner removed has area $48 - 6 = 42 \text{ cm}^2$. Its perimeter is still 28 cm: the two removed outside segments total 5 cm and the two new notch edges also total 5 cm. This perimeter equality depends on a corner rectangular cut; an internal hole adds a separate boundary. Rearranging triangle area gives $h = 2A/b$.

164. Sine rule, cosine rule and triangle area · Higher

Sine rule, cosine rule and triangle area · Higher

With sides 6 and 8 enclosing 60° , $c^2 = 36 + 64 - 96 \times (1/2) = 52$, hence $c = 2\sqrt{13}$. Its area is $(1/2) \times 6 \times 8 \times \sin 60^\circ = 12\sqrt{3}$. For $a=4$ opposite $A=30^\circ$ and $B=45^\circ$, $b=4 \sin 45^\circ / \sin 30^\circ = 4\sqrt{2}$. If sides $a=7, b=5, c=6$, $\cos A = (25 + 36 - 49) / (2 \times 5 \times 6) = 1/5$, so $A \approx 78.5^\circ$. To find an angle from area 12 with enclosing sides 6 and 8, $\sin C = 24/48 = 1/2$; C could be 30° or 150° until the remaining data selects a shape. Label opposite pairs and check triangle inequalities to reject impossible side combinations.

Exercises 2.1·2.3

2.1 (Foundation) Find the trapezium area for parallel sides 6,10 and height 4.

2.2 (Foundation) Find area of 8×6 rectangle with 3×2 corner removed.

2.3 (Foundation) Find the perimeter of that corner-cut shape.

3 Exam-style questions

Exercises 2.1·2.3

2.1 (Foundation) Find the trapezium area for parallel sides 6,10 and height 4.

$$2.1 \quad (6+10) \times 4 / 2 = 32.$$

2.2 (Foundation) Find area of 8×6 rectangle with 3×2 corner removed.

$$2.2 \quad 8 \times 6 - 3 \times 2 = 42.$$

2.3 (Foundation) Find the perimeter of that corner-cut shape.

3 Exam-style questions

2.3 Count the six outside edges; the notch replaces equal total lengths.

Exercise 3.1

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: The sloping side of a parallelogram is always its perpendicular height.

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3.1 False. A parallelogram with base 8, sloping side 5 and perpendicular height 4 has area $8 \times 4 = 32$, not $8 \times 5 = 40$. Use the perpendicular separation of parallel sides.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.