



**eClassroom**

GCSE Mathematics

# **Area & Perimeter**

**Worked Solutions**

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Pearson Edexcel GCSE & iGCSE Mathematics



## Section A — Foundation — Worked Solutions

### [Fluency] Question 1

$$\text{Area} = 8 \times 5 = 40 \text{ cm}^2$$

$$\text{Perimeter} = 2(8+5) = 26 \text{ cm}$$

$$\therefore \text{Area} = 40 \text{ cm}^2, \text{ Perimeter} = 26 \text{ cm}$$

### [Fluency] Question 2

$$\frac{1}{2} \times 10 \times 7$$

$$\therefore 35 \text{ cm}^2$$

### [Fluency] Question 3

$$\frac{1}{2}(6 + 10) \times 4 = \frac{1}{2} \times 16 \times 4$$

$$\therefore 32 \text{ cm}^2$$

### [Fluency] Question 4

$$12 \times 5$$

$$\therefore 60 \text{ cm}^2$$

### [Fluency] Question 5

$$(a) \text{ Area} = \pi \times 6^2 = 36\pi \approx 113.1 \text{ cm}^2$$

$$(b) \text{ Circumference} = 2\pi \times 6 = 12\pi \approx 37.7 \text{ cm}$$

$$\therefore (a) 36\pi \approx 113.1 \text{ cm}^2 \quad (b) 12\pi \approx 37.7 \text{ cm}$$

### [Reasoning] Question 6

Total rectangle  $10 \times 8 = 80 \text{ cm}^2$ , cut out  $3 \times 4 = 12 \text{ cm}^2$

$$\therefore 68 \text{ cm}^2$$

### [Reasoning] Question 7

$$\text{Area} = \frac{1}{2}\pi r^2 = \frac{25\pi}{2} \text{ cm}^2$$

$$\text{Perimeter} = \pi r + 2r = 5\pi + 10 \text{ cm}$$

$$\therefore 25\pi/2 \text{ cm}^2 \quad 5\pi+10 \text{ cm}$$



**[Reasoning] Question 8**

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$$\text{Area} = \frac{60}{360} \times \pi \times 81 = \frac{81\pi}{6} = \frac{27\pi}{2} \approx 42.4 \text{ cm}^2$$

$$\text{Arc} = \frac{60}{360} \times 2\pi \times 9 = 3\pi \approx 9.4 \text{ cm}$$

$$\therefore \text{Area} \approx 42.4 \text{ cm}^2 \quad \text{Arc} \approx 9.4 \text{ cm}$$

**[Problem Solving] Question 9**

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$$\pi(8^2 - 5^2) = \pi(64 - 25) = 39\pi$$

$$\therefore 39\pi \text{ cm}^2$$

**[Problem Solving] Question 10**

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Two rectangles:  $14 \times 6 = 84 \text{ cm}^2$  and  $7 \times 5 = 35 \text{ cm}^2$

$$\therefore 119 \text{ cm}^2$$



## Section B — Higher — Worked Solutions

### [Fluency] Question 1

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$$\text{Area} = \frac{135}{360} \pi (12)^2 = \frac{3}{8} \times 144\pi = 54\pi \text{ cm}^2$$

$$\text{Arc} = \frac{135}{360} \times 2\pi(12) = 9\pi \text{ cm}$$

$$\text{Perimeter} = 9\pi + 24 \text{ cm}$$

$$\therefore \text{Area} = 54\pi \text{ cm}^2, \text{ Perimeter} = (9\pi+24) \text{ cm}$$

### [Fluency] Question 2

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$$r = \sqrt{\frac{75}{\pi}}$$

$$\therefore r \approx 4.89 \text{ cm}$$

### [Fluency] Question 3

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$$\pi(10^2 - 6^2) = \pi(100 - 36) = 64\pi$$

$$\therefore 64\pi \text{ cm}^2$$

### [Reasoning] Question 4

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$$\theta = \frac{l}{r} = \frac{15}{9} \text{ rad} = \frac{15}{9} \times \frac{180}{\pi}$$

$$\therefore \theta \approx 95.5^\circ$$

### [Reasoning] Question 5

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$$\text{Arc} = 40 - 2 \times 12 = 16 \text{ cm}$$

$$\theta = \frac{16}{12} \text{ rad} = \frac{16}{12} \times \frac{180}{\pi}$$

$$\therefore \theta \approx 76.4^\circ$$

### [Reasoning] Question 6

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$$\text{Area} = \frac{1}{2} \times 8 \times 10 \times \sin 35^\circ$$

$$\therefore \approx 22.9 \text{ cm}^2$$



**[Problem Solving] Question 7**

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$$\text{Sector} = \frac{80}{360}\pi(100) = \frac{200\pi}{9} \approx 69.8 \text{ cm}^2$$

$$\text{Triangle} = \frac{1}{2}(100)\sin 80^\circ \approx 49.2 \text{ cm}^2$$

$$\text{Segment} = 69.8 - 49.2$$

$$\therefore \approx \mathbf{20.6 \text{ cm}^2}$$

**[Problem Solving] Question 8**

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$$\text{Rectangle} = 15 \times 8 = 120 \text{ cm}^2$$

$$\text{Semicircle} = \frac{1}{2}\pi(7.5)^2 \approx 88.4 \text{ cm}^2$$

$$\therefore \approx \mathbf{208.4 \text{ cm}^2}$$

**[Problem Solving] Question 9**

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$$\text{Inner dimensions} = (20-3) \times (15-3) = 17 \times 12 = 204 \text{ m}^2$$

$$\text{Outer} = 300 \text{ m}^2. \text{ Path} = 300 - 204$$

$$\therefore \mathbf{96 \text{ m}^2}$$

**[Problem Solving] Question 10**

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$$\text{Area} = \frac{1}{2}d_1d_2 = \frac{1}{2} \times 10 \times 16$$

$$\therefore \mathbf{80 \text{ cm}^2}$$

