



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Area & Perimeter (including Circles) · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☐ Secure

☒ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Area & Perimeter (including Circles)

Total marks available: 104

● Area & Perimeter (including Circles)

✓39.2m

Q1 · ● Developing · 4 marks

METHOD

An L-shape's perimeter equals its bounding rectangle's perimeter.

$$\text{Perimeter} = 2 \times (10.1 + 9.5) = 39.2\text{m}$$

✓20.7cm

Q2 · ● Developing · 3 marks

METHOD

$$\text{Circumference} = \pi d = \pi \times 6.6 = 20.7\text{cm}$$

✓158m²

Q3 · ● Developing · 3 marks

METHOD

$$\text{Area} = \pi r^2 = \pi \times 50.41 = 158\text{m}^2$$

✓65.4m

Q4 · ● Developing · 4 marks

METHOD

An L-shape's perimeter equals its bounding rectangle's perimeter.

$$\text{Perimeter} = 2 \times (23.9 + 8.8) = 65.4\text{m}$$

✓573m²

Q5 · ● Developing · 3 marks

METHOD

$$\text{Area} = \pi r^2 = \pi \times 182.25 = 573\text{m}^2$$

✓55.8cm

Q6 · ● Developing · 4 marks

METHOD

An L-shape's perimeter equals its bounding rectangle's perimeter.

$$\text{Perimeter} = 2 \times (19.5 + 8.4) = 55.8\text{cm}$$

✓183m²

Q7 · ● Developing · 4 marks

METHOD

Area = (full rectangle) - (notch)

$$\text{Area} = (19.8 \times 10.8) - (6.2 \times 4.9)$$

$$\text{Area} = 213.84 - 30.38 = 183\text{m}^2$$

✓995m²

Q8 · ● Developing · 3 marks

METHOD

$$\text{Area} = \pi r^2 = \pi \times 316.84 = 995\text{m}^2$$

✓63.6cm²

Q9 · ● Developing · 3 marks

METHOD

$$\text{Area} = \pi r^2 = \pi \times 20.25 = 63.6\text{cm}^2$$

✓36.3m²

Q10 · ● Developing · 3 marks

METHOD

$$\text{Area} = \pi r^2 = \pi \times 11.56 = 36.3\text{m}^2$$

✓28.0m

Q11 · ● Secure · 3 marks

METHOD

$$\text{Arc length} = (\theta/360) \times 2\pi r$$

$$\text{Arc length} = (150/360) \times 2 \times \pi \times 10.7 = 28.0\text{m}$$

✓18.2m

Q12 · ● Secure · 3 marks

METHOD

$$\text{Arc length} = (\theta/360) \times 2\pi r$$

$$\text{Arc length} = (120/360) \times 2 \times \pi \times 8.7 = 18.2\text{m}$$

✓17.4m

Q13 · ● Secure · 3 marks

METHOD

$$\text{Arc length} = (\theta/360) \times 2\pi r$$

$$\text{Arc length} = (135/360) \times 2 \times \pi \times 7.4 = 17.4\text{m}$$

✓49.0cm²

Q14 · ● Secure · 3 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\text{Area} = (90/360) \times \pi \times 62.41 = 49.0\text{cm}^2$$

✓20.9cm

Q15 · ● Secure · 3 marks

METHOD

$$\text{Arc length} = (\theta/360) \times 2\pi r$$

$$\text{Arc length} = (120/360) \times 2 \times \pi \times 10.0 = 20.9\text{cm}$$

✓ 42.5cm²

Q16 · ● Secure · 3 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\text{Area} = (150/360) \times \pi \times 32.49 = 42.5\text{cm}^2$$

✓ 3.46m

Q17 · ● Secure · 3 marks

METHOD

$$\text{Arc length} = (\theta/360) \times 2\pi r$$

$$\text{Arc length} = (30/360) \times 2 \times \pi \times 6.6 = 3.46\text{m}$$

✓ 33.5m

Q18 · ● Secure · 3 marks

METHOD

$$\text{Arc length} = (\theta/360) \times 2\pi r$$

$$\text{Arc length} = (135/360) \times 2 \times \pi \times 14.2 = 33.5\text{m}$$

✓ 93.1m²

Q19 · ● Secure · 3 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\text{Area} = (45/360) \times \pi \times 237.16 = 93.1\text{m}^2$$

✓ 35.6cm²

Q20 · ● Secure · 3 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\text{Area} = (135/360) \times \pi \times 30.25 = 35.6\text{cm}^2$$

✓100.0°

Q21 · ● Greater Depth · 4 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\theta = (\text{Area} \div \pi r^2) \times 360$$

$$\theta = (101.8 \div 366.44) \times 360 = 100.0^\circ$$

✓40.0°

Q22 · ● Greater Depth · 4 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\theta = (\text{Area} \div \pi r^2) \times 360$$

$$\theta = (15.2 \div 136.85) \times 360 = 40.0^\circ$$

✓5.0cm

Q23 · ● Greater Depth · 4 marks

METHOD

$$A = \pi r^2$$

$$r^2 = A \div \pi = 78.5 \div \pi = 24.987$$

$$r = \sqrt{24.987} = 5.0\text{cm}$$

✓3.0m

Q24 · ● Greater Depth · 4 marks

METHOD

$$A = \pi r^2$$

$$r^2 = A \div \pi = 28.3 \div \pi = 9.008$$

$$r = \sqrt{9.008} = 3.0\text{m}$$

✓9.9m

Q25 · ● Greater Depth · 4 marks

METHOD

$$A = \pi r^2$$

$$r^2 = A \div \pi = 307.9 \div \pi = 98.008$$

$$r = \sqrt{98.008} = 9.9\text{m}$$

✓9.7m

Q26 · ● Greater Depth · 4 marks

METHOD

$$A = \pi r^2$$

$$r^2 = A \div \pi = 295.6 \div \pi = 94.092$$

$$r = \sqrt{94.092} = 9.7\text{m}$$

✓100.0°

Q27 · ● Greater Depth · 4 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\theta = (\text{Area} \div \pi r^2) \times 360$$

$$\theta = (15.4 \div 55.42) \times 360 = 100.0^\circ$$

✓6.0cm

Q28 · ● Greater Depth · 4 marks

METHOD

$$A = \pi r^2$$

$$r^2 = A \div \pi = 113.1 \div \pi = 36.001$$

$$r = \sqrt{36.001} = 6.0\text{cm}$$

✓40.0°

Q29 · ● Greater Depth · 4 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\theta = (\text{Area} \div \pi r^2) \times 360$$

$$\theta = (33.5 \div 301.72) \times 360 = 40.0^\circ$$

✓40.1°

Q30 · ● Greater Depth · 4 marks

METHOD

$$\text{Area} = (\theta/360) \times \pi r^2$$

$$\theta = (\text{Area} \div \pi r^2) \times 360$$

$$\theta = (12.6 \div 113.1) \times 360 = 40.1^\circ$$