

GEOMETRY: AREA OF COMPOUND CIRCULAR SHAPES**Best Guess Mastery Worksheet (Target Grade 4/5)****I Do**

The diagram shows a plan of a patio.

The edge of the patio consists of two semicircles and two straight lines.

Each semicircle has centre O .

The diameter of the large semicircle is 10 m.

The diameter of the small semicircle is 6 m.

Paving Stones

£24 per m^2

Jo is going to cover the patio with paving stones.

Jo has a budget of £1200.

Has Jo got enough money to buy all the paving stones she needs?

You must show all your working.

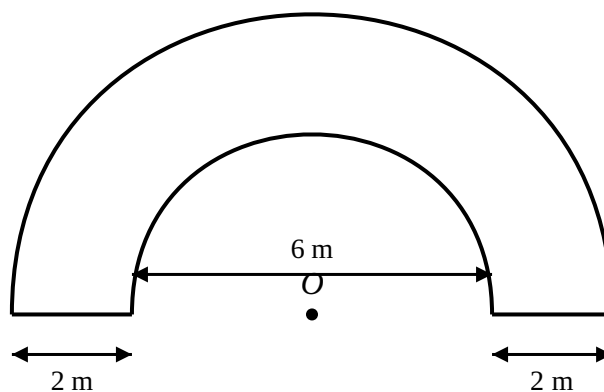


Diagram NOT
accurately drawn

GEOMETRY: AREA OF COMPOUND CIRCULAR SHAPES**Best Guess Mastery Worksheet (Target Grade 4/5)****We Do**

The diagram shows a circular park with a circular concrete stage in the middle.

The rest of the park is covered in grass.

The radius of the concrete stage is 3 m.

The radius of the entire park is 8 m.

Grass Seed

£3.50 per m²

Doug wants to re-seed the grass area of the park.

He has a budget of £650.

Does Doug have enough money to buy the grass seed?

You must show all your working.

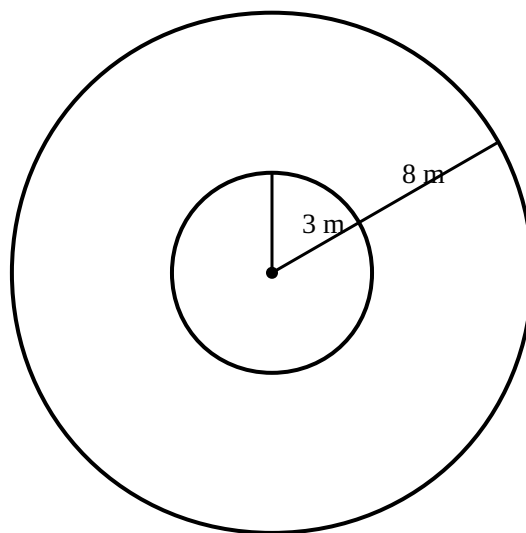


Diagram NOT
accurately drawn

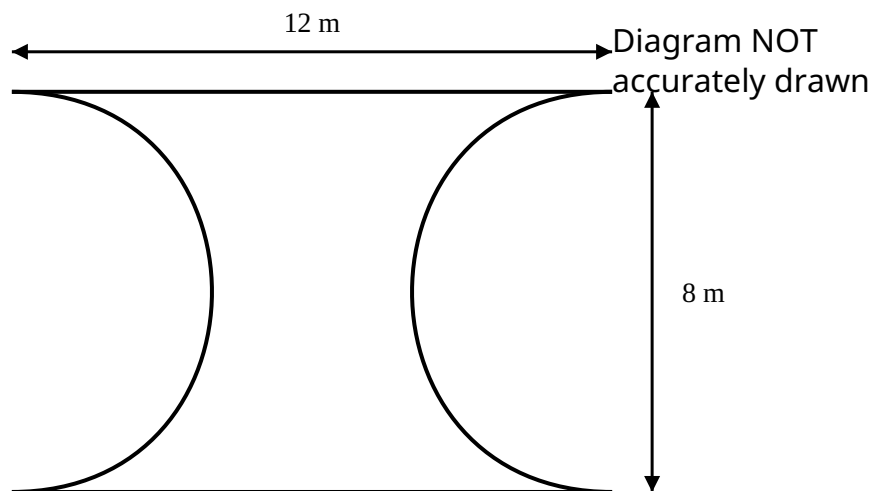
GEOMETRY: AREA OF COMPOUND CIRCULAR SHAPES**Best Guess Mastery Worksheet (Target Grade 4/5)****You Do 1**

The diagram shows a flat metal plate made by Fin.

The plate is made from a rectangle with two identical semicircles removed from the ends.

Calculate the area of the metal plate.

Give your answer correct to 1 decimal place.



Area = m²

GEOMETRY: AREA OF COMPOUND CIRCULAR SHAPES

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You Do 2

The diagram shows a geometric logo designed by Maia.

The logo is formed by taking a quarter of a circle and removing a smaller quarter circle from it.

Calculate the area of the logo.

Give your answer correct to 1 decimal place.

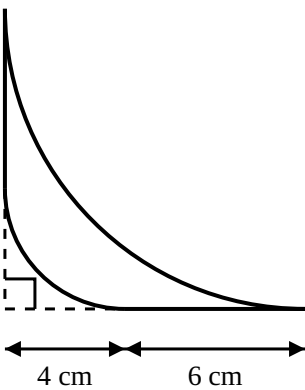


Diagram NOT
accurately drawn

Area = cm²

GEOMETRY: AREA & PERIMETER OF SECTORS

Best Guess Mastery Worksheet (Target Grade 4/5)

Challenge 1

The diagram shows a badge created by Sarah, made from a large sector of a circle with a smaller sector removed.

Both sectors have the same centre O .

Calculate the **total perimeter** of the badge.

Give your answer correct to 1 decimal place.

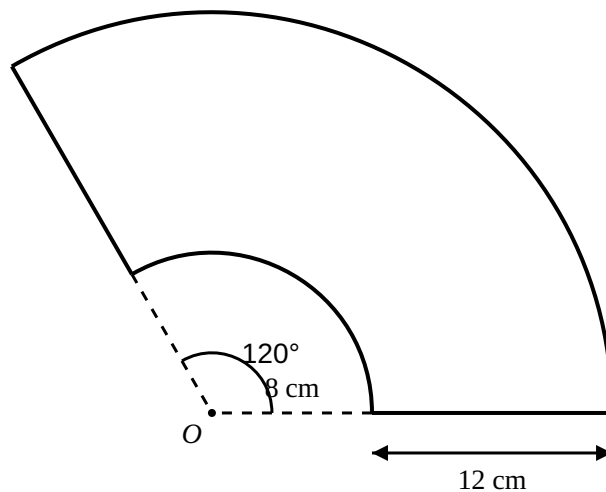


Diagram NOT
accurately drawn

Perimeter = cm

GEOMETRY: AREA & PERIMETER OF SECTORS**Best Guess Mastery Worksheet (Target Grade 4/5)****Challenge 2**

The diagram shows a sector of a circle being analysed by Don.

It has a centre O and radius 18 cm.

The area of the sector is $45\pi \text{ cm}^2$.

Form and solve a linear equation to find the value of the angle x .

Hence, calculate the arc length of the sector. Give your answer as a multiple of π .

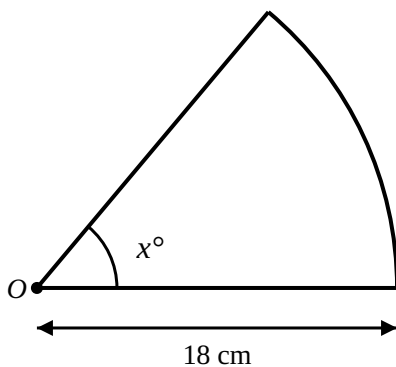


Diagram NOT
accurately drawn

$x = \dots\dots\dots^\circ$

Arc length = cm

Answers & Worked Solutions

I Do:

1. Large semicircle diameter = $2\text{m} + 6\text{m} + 2\text{m} = 10\text{m}$. Radius = 5m .
Area of large semicircle = $\frac{1}{2} \times \pi \times 5^2 = 12.5\pi$
2. Small semicircle diameter = 6m . Radius = 3m .
Area of small semicircle = $\frac{1}{2} \times \pi \times 3^2 = 4.5\pi$
3. Total Area = $12.5\pi - 4.5\pi = 8\pi \approx 25.133 \text{ m}^2$
4. Total Cost = $25.133 \times 24 = \text{£}603.19$
5. Conclusion: **Yes, Jo has enough money. She has £596.81 remaining.**

We Do:

1. Area of entire park (outer circle) = $\pi \times 8^2 = 64\pi$
2. Area of concrete stage (inner circle) = $\pi \times 3^2 = 9\pi$
3. Area of grass = $64\pi - 9\pi = 55\pi \approx 172.788 \text{ m}^2$
4. Total Cost = $172.788 \times 3.50 = \text{£}604.76$
5. Conclusion: **Yes, Doug has enough money (it is less than £650).**

You Do 1:

1. Area of full rectangle = $12 \times 8 = 96 \text{ m}^2$
2. The two semicircles make one full circle with diameter 8m (radius 4m).
3. Area of removed circle = $\pi \times 4^2 = 16\pi \approx 50.265 \text{ m}^2$
4. Area of plate = $96 - 50.265 = 45.734... \rightarrow \textbf{45.7 m}^2$

You Do 2:

1. Outer radius = $4 + 6 = 10 \text{ cm}$. Inner radius = 4 cm .
2. Area of large quarter circle = $\frac{1}{4} \times \pi \times 10^2 = 25\pi$
3. Area of small quarter circle = $\frac{1}{4} \times \pi \times 4^2 = 4\pi$
4. Area of logo = $25\pi - 4\pi = 21\pi \approx 65.973... \rightarrow \textbf{66.0 cm}^2$

Challenge 1:

1. Inner radius = 8 cm . Outer radius = $8 + 12 = 20 \text{ cm}$.
2. Outer arc length = $(120/360) \times \pi \times (2 \times 20) = (1/3) \times 40\pi = 40\pi/3 \approx 41.888 \text{ cm}$.
3. Inner arc length = $(120/360) \times \pi \times (2 \times 8) = (1/3) \times 16\pi = 16\pi/3 \approx 16.755 \text{ cm}$.
4. Straight edges = $12 + 12 = 24 \text{ cm}$.
5. Total Perimeter = $41.888 + 16.755 + 24 = 82.643... \rightarrow \textbf{82.6 cm}$

Challenge 2:

1. Formula for Area of Sector: $(x / 360) \times \pi \times r^2 = \text{Area}$
2. Substitute values: $(x / 360) \times \pi \times 18^2 = 45\pi$
3. Simplify and cancel π : $(x / 360) \times 324 = 45 \rightarrow 324x = 16200 \rightarrow x = 50^\circ$
4. Formula for Arc Length: $(x / 360) \times \pi \times D$
5. Arc Length = $(50 / 360) \times \pi \times 36 = (5/36) \times 36\pi = 5\pi \text{ cm}$