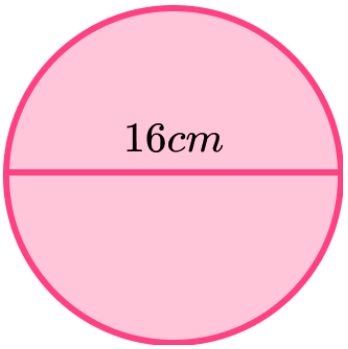
Circles, Arcs and Sectors - Worksheet

Skill

Group A - area and circumference of a circle

Give each answer to 3 significant figures

Use this diagram for questions 1-4



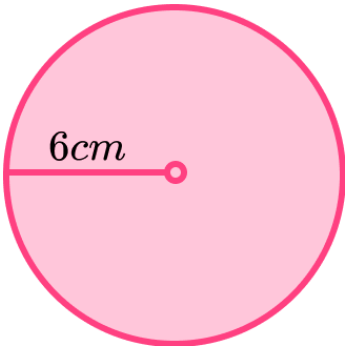
1) What is the radius of the circle?

2) What is the diameter of the circle?

3) What is the area of the circle?

4) What is the circumference of the circle?

Use this diagram for questions 5-8



5) What is the radius of the circle?

6) What is the diameter of the circle?

7) What is the area of the circle?

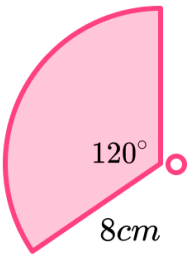
8) What is the circumference of the circle?

Group B - arc lengths and area of sectors

Shown below are all sectors with the centre of O.

Give each answer to 3 significant figures

Use this diagram for questions 1-3

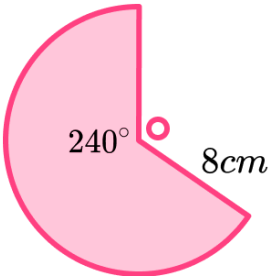


1) What is the length of the arc for the sector?

2) What is the area of the sector?

3) What is the perimeter of the sector?

Use this diagram for questions 4-6

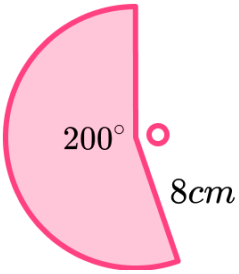


4) What is the length of the arc for the sector?

5) What is the area of the sector?

6) What is the perimeter of the sector?

Use this diagram for questions 7-9



7) What is the length of the arc for the sector?

8) What is the area of the sector?

9) What is the perimeter of the sector?

Group C - reversing the process

Work out:

Give each answer to 3 significant figures

A circle has a circumference of 100πcm^2
Find its:

1) Diameter **2)** Radius **3)** Area

A circle has a circumference of 70 cm^2
Find its:

4) Diameter **5)** Radius **6)** Area

A circle has an area of 100πcm^2
Find its:

7) Radius **8)** Diameter **9)** Circumference

A circle has an area of 70 cm^2
Find its:

10) Radius **11)** Diameter **12)** Circumference

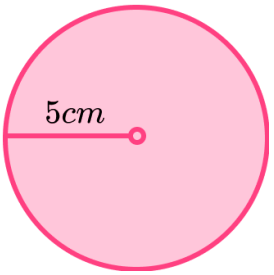
Circles, Arcs and Sectors - Worksheet

Applied

Give all answers to 3 significant figures

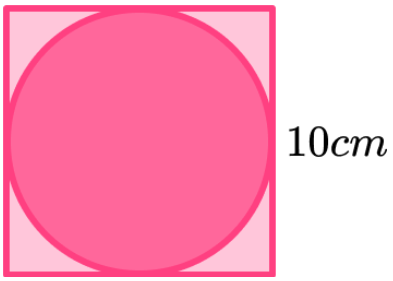
1) A semi circle has a perimeter of 90cm.
Calculate its diameter.

2)



What is the difference between the shape's area and circumference?

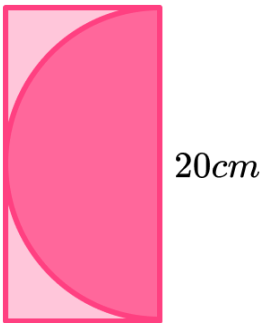
3) The shape below is made up of a square and a circle.
Each side of the square is 10cm



(a) What is the radius of the circle?

(b) Calculate the area of the shaded shape

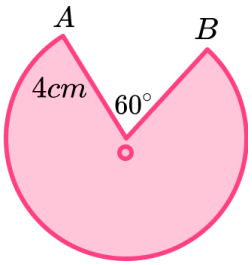
4) The shape below is made up of a semicircle and a rectangle. The diameter of the circle is 20cm



(a) What is the area of the shaded section?

Circles, Arcs and Sectors - Exam Questions

1)



AOB forms a sector with center O.
The acute angle at AOB is 60°.
AO = 4cm

(a) What is the area of sector AOB in terms of π?

.....cm^2
(3)

(b) What is the arc length of sector AOB?
Give your answer to 2 decimal places

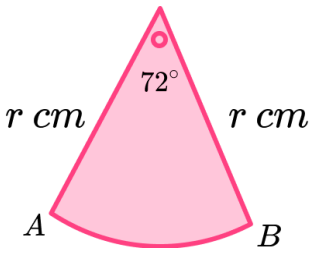
.....cm
(3)

(c) What is the perimeter of the sector AOB?
Give your answer to 3 significant figures.

.....cm
(2)

8 marks

2) **(a)**



AOB is a sector with angle 72°
The perimeter of AOB is 40cm
Find r.
Give your answer to 3 significant figures

.....
(4)

3) **(a)** The area of a circle is 49π.
What is the radius of the circle?

……cm
(1)

(b) What is the area of a semicircle with the same radius as (a)?
Give your answer in terms of pi.

……cm^2
(2)

(c) What is the perimeter of the semi circle in question (b)?
Give your answer to 3 significant figures

……cm
(5)
8 marks

Circles, Arcs and Sectors- Answers

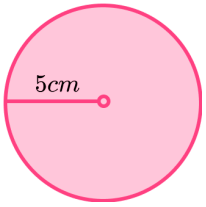
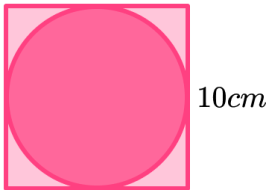
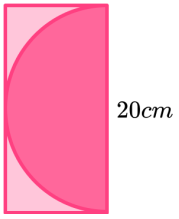
	Question	Answer
	Skill Questions	
Group A	**1)** What is the radius of the circle? **2)** What is the diameter of the circle? **3)** What is the area of the circle? **4)** What is the circumference of the circle? _____ **5)** What is the radius of the circle? **6)** What is the diameter of the circle? **7)** What is the area of the circle? **8)** What is the circumference of the circle?	**1) 8cm** **2) 16cm** **3) 201 cm^2** **4) 50.3cm** _____ **5) 6cm** **6) 12cm** **7) 113 cm^2** **8) 37.7cm**
Group B	Work out: **1)** What is the length of the arc for the sector? **2)** What is the area of the sector? **3)** What is the perimeter of the sector? _____ **4)** What is the length of the arc for the sector? **5)** What is the area of the sector? **6)** What is the perimeter of the sector? _____ **7)** What is the length of the arc for the sector? **8)** What is the area of the sector? **9)** What is the perimeter of the sector? _____	**1)16.8 cm** **2) 67.0cm^2** **3) 32.8cm** _____ **4) 33.5cm** **5) 134cm^2** **6) 49.5cm** _____ **7) 27.9cm** **8) 112cm^2** **9) 43.9cm** _____

Circles, Arcs and Sectors- Answers

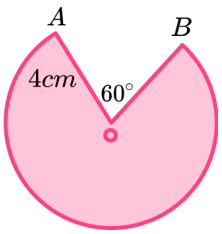
Group C	**A circle has a circumference of** 100π **cm**^{2}. **Find its:** **1)** Diameter **2)** Radius **3)** Area **A circle has a circumference of 70 cm**^{2} **Find its:** **4)** Diameter **5)** Radius **6)** Area **A circle has an area of** 100π**cm**^{2} **Find its:** **7)** Radius **8)** Diameter **9)** Circumference **A circle has an area of 70 cm**^{2} **Find its:** **10)** Radius **11)** Diameter **12)** Circumference	**1) 100cm** **2) 50cm** **3) 7850cm**^{2} **4)22.3 cm** **5)11.1cm (*accept 11.2*)** **6) 387cm**^{2} ***(accept 394)*** **7) 10cm** **8) 5cm** **9) 15.7cm** **10) 4.7cm** **11) 9.4cm** **12) 29.5cm**

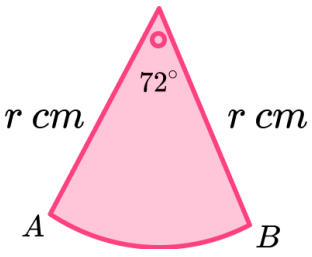
Circles, Arcs and Sectors- Answers

Applied- *Give all answers to 3 significant figures*

		Questions	Answers
1)		A semi circle has a perimeter of 90cm. Calculate its diameter.	**90=diameter + 0.5(πd)** **90= d + 0.5πd** **90= d(1+0.5π)** **d= 35**
2)			
	(a)	What is the difference between the shape's area and circumference?	**Area = 25π, Circumference = 10π** **Difference is = 15π = 47.1cm (3sf)**
3)		The shape below is made up of a square and a circle. Each side of the square is 10cm 	
	(a)	What is the radius of the circle?	**5cm**
	(b)	Calculate the area of the shaded shape	**Area of Square = 100cm^2** **Area of Circle = 25π** **Area of Shaded = 100-25π** **Area of Shaded =21.5 (3sf)cm^2**
4)		The shape below is made up of a semicircle and a rectangle. The diameter of the circle is 20cm 	
	(a)	What is the area of the shaded section?	**Area of Rectangle = 20 x 10 = 200** **Area of Semicircle = 0.5 x π x 10^2** **Area of Semicircle =50π** **Shaded= 200 - 50π = 42.9 (3sf) cm^2**

Circles, Arcs and Sectors - Mark Scheme

1)	 AOB forms a sector with centre O. The acute angle at AOB is 60°. AO = 4cm		
	(a) What is the area of sector AOB in terms of π?	300 seen $\frac{300}{360} \times \pi \times 4^2$ oe $\frac{40}{3}\pi$	**(1)** **(1)** **(1)**
	(b) What is the arc length of sector AOB? Give your answer to 2 decimal places	$\frac{300}{360} \times \pi \times 8$ oe 20.9439.. 20.94.	**(1)** **(1)** **(1)**
	(c) What is the perimeter of the sector AOB? Give your answer to 3 significant figures.	"20.9" + 8 oe 28.9	**(1)** **(1)**

2)	**(a)**  AOB is a sector with angle 72°. The perimeter of AOB is 40cm Find r. Give your answer to 3 significant figures	A correct equation created or implied e.g $40 = 2r + (\frac{72}{360} \times \pi \times 2r)$ Attempt to solve for r with at least 2 steps carried out correctly $40 = 2r + \frac{2r}{5}\pi$ $200 = 10r + 2r\pi$ $200 = r(10 + 2\pi)$ $12.282... = r$ 12.3 ft	**(1)** **(1)** **(1)** **(1)**

3)	**(a)**	The area of a circle is 49π. What is the radius of the circle?	7	**(1)**
	(b)	What is the area of a semicircle with the same radius as (a)? Give your answer in terms of pi.	$\frac{49}{2}\pi$	**(1)**
	(c)	What is the perimeter of the semi circle in question (b) Give your answer to 3 significant figures	Attempt to find the arc length Correct Arc length found 7π oe "7π" + 2("7") oe 35.9911 36.0	**(1)** **(1)** **(1)** **(1)** **(1)**