

## Sectors Exam Questions

**Q1.**

The diagram shows sector  $OAB$  of a circle, centre  $O$ .

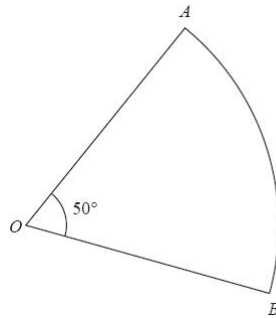


Diagram NOT  
accurately drawn

Angle  $AOB = 50^\circ$   
Sector  $OAB$  has area  $20\pi \text{ cm}^2$

Calculate the perimeter of sector  $OAB$ .  
Give your answer correct to 3 significant figures.

..... cm

**(Total for question = 5 marks)**

**Q2.**

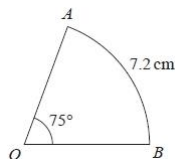


Diagram NOT  
accurately drawn

The diagram shows a sector  $OAB$  of a circle, centre  $O$ .

Angle  $AOB = 75^\circ$   
Length of arc  $AB = 7.2 \text{ cm}$

Calculate the area of the sector.  
Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

**(Total for question = 4 marks)**

**Q3.**

The diagram shows a sector  $OAPB$  of a circle, centre  $O$ .

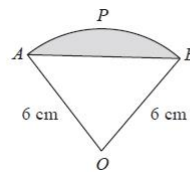


Diagram NOT  
accurately drawn

$AB$  is a chord of the circle.  
 $OA = OB = 6$  cm.

The area of sector  $OAPB$  is  $5\pi$  cm<sup>2</sup>

Calculate the perimeter of the shaded segment.  
Give your answer correct to 3 significant figures.

(Total for question = 6 marks)

## Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
	$\frac{50}{360} \times \pi \times r^2 = 20\pi$ oe	34.5	5	M1 A correct equation for area of sector
	$r^2 = \frac{360 \times 20}{50}$ or $\frac{360 \times 20\pi}{50\pi}$ oe (=144)		M1 Correct rearrangement in terms of $r^2$	
	$r = 12$		A1 $r = 12$	
	(perimeter =) $12 + 12 + \frac{50}{360} \times 2 \times 12 \times \pi$ (= $24 + \frac{20\pi}{3}$ ) (=24 + 10.47...)		M1ft (ft dep on M2) for arc length $\frac{50}{360} \times 2 \times '12' \times \pi$ (=10.47...) Or $l = \frac{20\pi}{12 \times 0.5}$ oe	
				A1 Accept 34.4 - 34.5
				<b>Total 5 marks</b>
	<i>Misread of 20 for 20π</i>			
	$\frac{50}{360} \times \pi \times r^2 = 20$			M1 Equation for area of sector using 20
	$r^2 = \frac{360 \times 20}{50\pi}$ (=45.8...)		M1 Correct rearrangement in terms of $r^2$	
	$r = 6.77$		A0	
	(perimeter =) $6.77 + 6.77 + \frac{50}{360} \times 2 \times 6.77 \times \pi$ (=19.4...)			M1ft (ft dep on M2) for arc length $\frac{50}{360} \times 2 \times 6.77 \times \pi$ (=5.91...)
				A0
				(Misread maximum 3 marks)

Q2.

Question	Working	Answer	M	Notes
	$\frac{75}{360} \times \pi \times d (2r) = 7.2$	19.8	4	M1 for a correct equation linking the angle and arc length  NB: 0.208(3...) may be used in place of $\frac{75}{360}$ or 4.8 in place of $\frac{360}{75}$
	$\frac{7.2 \times 360}{75 \times \pi}$ oe or $\frac{7.2 \times 360}{75 \times 2 \times \pi}$ oe or $d = 11(0...)$ or $r = 5.5(0...)$		M1 for a complete method to find the radius or diameter.	
	$\frac{75}{360} \times \pi \times \left(\frac{11}{2}\right)^2$ or $\frac{75}{360} \times \pi \times 5.5^2$ or $\frac{75}{360} \times 95(04...)$		M1 dep on previous M1	
				A1 for answer in range 19.8 – 19.82
				<b>Total 4 marks</b>

Q3.

Q	Working	Answer	Mark	Notes
	$\frac{x}{360} \times \pi \times r^2 = 5\pi$ $x = 50$		6	M1 for this mark only condone an incorrect value for $r$ A1 cao for angle $AOB = 50$
	$(AB^2 =) 6^2 + 6^2 - 2 \times 6 \times 6 \times \cos(^{\circ}50)$ $(AB =) \sqrt{25.7...}$ or $5.07...$			M1 dep on first M1 or $6 \times \sin(^{\circ}50/2)$   M2 for $(AB =)$ M1 dep or $2 \times 6 \times \sin(^{\circ}50/2)$   $\sqrt{25.7...}$ or $5.07...$ or $2 \times 6 \times \sin^{\circ}50/2$
	$\frac{50}{360} \times 2 \times \pi \times 6$ or $\frac{5\pi \times 2\pi \times 6}{\pi \times 6^2}$ or $\frac{5}{3}\pi$ or $5.23...$			M1 dep on first M1 if " $50$ " used but indep if angle not used
		10.3		A1 for answer in range 10.2 – 10.31
				<b>Total 6 marks</b>