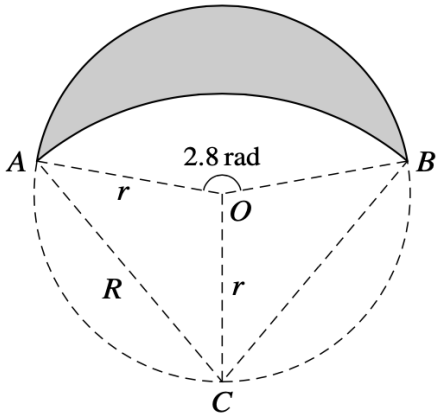
Q1 (10)

10



The diagram shows points A, B and C lying on a circle with centre O and radius r. Angle AOB is 2.8 radians. The shaded region is bounded by two arcs. The upper arc is part of the circle with centre O and radius r. The lower arc is part of a circle with centre C and radius R.

(a) State the size of angle ACO in radians. [1]

(b) Find R in terms of r. [1]

(c) Find the area of the shaded region in terms of r. [7]

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Question	Answer	Marks	Guidance
10(a)	Angle $ACO = 0.7$	**B1**	Don't allow AWRT 0.7 .
		1	
10(b)	$[R =]$ $1.53\,r$	**B1**	Allow AWRT $1.53r$.
		1	
10(c)	Sector $OAB = \frac{1}{2}r^2 \times 2.8$ $[= 1.4r^2]$	**B1**	
	Sector $CAB = \frac{1}{2}(their\ R)^2 \times 2 \times their\ 0.7$	***M1**	
	$1.638\,r^2$	**A1**	Allow AWRT $1.64\,r^2$.
	$[2] \times \frac{1}{2}r^2 \sin(\pi - 1.4)$ OR $[2] \times \frac{1}{2} r \times their R \sin 0.7$	***M1**	
	$2 \times 0.4927r^2$	**A1**	Allow AWRT $0.98\,r^2$ to $0.99\,r^2$.
	$1.4r^2 - (their\ 1.638r^2 - their\ 0.985r^2)$	**DM1**	
	$0.747r^2$ to $0.748r^2$	**A1**	
		7	