Question Number	Scheme	Marks
6.(a)	Sets $4x+c=x(x-3)$ and attempts to write as a 3TQ	M1
	Uses $b^2=4ac$ for their $x^2-7x-c=0$	dM1
	Correct equation $49=-4c$ or $49+4c=0$	A1
	$c=-12.25$ oe	A1
		(4)
(b)	Attempt to solve $x^2-7x-c=0$ with their c	M1
	Attempt to find the y coordinate for their x coordinate	dM1
	$\left(\frac{7}{2},\frac{7}{4}\right)$ oe	A1
		(3)
		(7 marks)

(a)

M1 Sets $4x+c=x(x-3)$ and attempts to write as a 3TQ. All terms don't need to be on the same side of the equation and you should condone slips

dM1 Attempts to use $b^2=4ac$ or $b^2-4ac=0$ for their 3TQ. This may be implied by later work.
For a correct 3TQ, errors on "c" will be common, so condone $\pm 49\pm 4c=0$ oe

A1 Correct equation formed in 'c'

A1 Correct solution $c=-12.25$ oe

(b)

M1 Attempts to solve their $x^2-7x-c=0$ with their c $\left(c\neq 0\right)$
Allow usual methods. If a calculator is used then the answer(s) must be correct for their 3TQ
Incorrect values of c may produce two values of x

dM1 Attempt to find the y coordinate from their x coordinate. It is dependent upon the previous M
If there are two coordinates they only need to find the y value for one of their x values to score this mark.

A1 Correct coordinate given $\left(\frac{7}{2},\frac{7}{4}\right)$ or exact equivalent. Allow written separately $x=3.5, y=1.75$

If c is correct allow the answer to score all 3 marks as long as no incorrect working is seen.

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Alternative to (a) by using gradients

M1 Attempts to set $\frac{\mathrm{d}}{\mathrm{d}x}\left(x^2-3x\right)=4\Rightarrow 2x-3=4\Rightarrow x=\ldots.$

dM1 Attempts to find the y coordinate by substituting this answer in $y=x(x-3)$

A1 Correct equation in c Eg $\frac{7}{4}=4\times\frac{7}{2}+c$

A1 Correct solution $c=-12.25$ oe

Note: Using this method the answer to (b) is found before (a). Some candidates will not realise this however. For the marks in (b) to be awarded there must be a statement somewhere in the solution to the effect that they know that they have solved part (b). This could be simply

(b) $\left(3.5,1.75\right)$ or coordinates of point of intersection is $\left(\frac{7}{2},\frac{7}{4}\right)$

Question Number	Scheme	Marks
7.(a)	Attempts to use $\frac{1}{2}r^2\theta$ with $r=6$ and any allowable angle θ	M1
	Full method to find area $\frac{1}{2}\times6^2\times(2\pi-0.7)$ or $\pi\times6^2-\frac{1}{2}\times6^2\times0.7$	M1
	$=100.5\,\text{cm}^2$ (awrt)	A1
		(3)
(b)	Attempts $\frac{\sin\angle ADO}{6}=\frac{\sin 0.7}{5}\Rightarrow \sin\angle ADO=0.77...$	M1 A1
	$\angle ADO=2.258$ (awrt)	A1
		(3)
(c)	Attempts arc length $ABC=6\times(2\pi-0.7)$ 33.50	M1
	Attempts length OD $\frac{\sin(\pi-0.7-"2.258")}{OD}=\frac{\sin 0.7}{5}\Rightarrow OD=...$ 1.42	M1
	Full method to find perimeter = "33.50"+5+ 6−"1.42"	ddM1
	= 43.1 cm	A1
		(4)
		(10 marks)
Alt (c)	Alternative for arc length $ABC=12\pi-6\times0.7$	M1
	Alternative for finding OD using the cosine rule $OD^2=6^2+5^2-2\times6\times5\cos(\pi-0.7-"2.258")\Rightarrow OD$	M1
	Solutions where candidate changes to degrees	
	Look for angle AOD = awrt $40°$ to score M marks	
7.(a)	Attempts to use $\frac{\theta}{360}\pi r^2$ with $r=6$ and angle $\theta=$ awrt 40 or 320	M1
	Full method to find area $\frac{(360-\text{awrt }40)}{360}\times\pi6^2$ or $\pi\times6^2-\frac{\text{awrt }40}{360}\times\pi6^2$	M1
	$=100.5\,\text{cm}^2$ (awrt)	A1
		(3)
(b)	Attempts $\frac{\sin\angle ADO}{6}=\frac{\sin 40°}{5}\Rightarrow \sin\angle ADO=0.77...$	M1 A1
	$\angle ADO=129.4°$ (awrt)	A1
		(3)
(c)	Attempts arc length $ABC=\frac{(360-40)}{360}\times2\pi6$ 33.50	M1
	Attempts length OD $\frac{\sin(180-40-"129.4")}{OD}=\frac{\sin 40}{5}\Rightarrow OD=...$ 1.42	M1
	Full method to find perimeter = "33.50"+5+ 6−"1.42"	ddM1
	= 43.1 cm	A1
		(4)
		(10 marks)