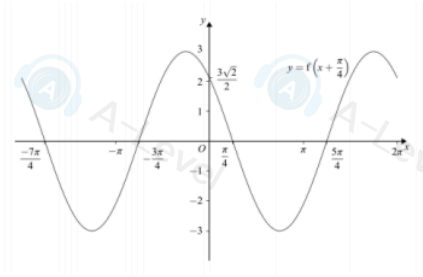
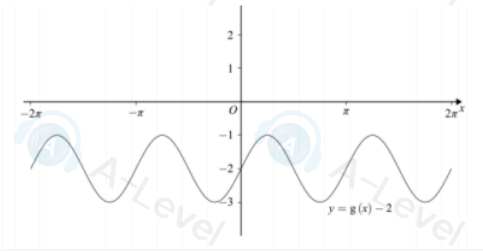
Question Number	Scheme	Marks
9(a)	$(A=)-3$	B1
		(1)
(b)	$y=3$	B1
	eg $x=30+5\times180$ or $x=210+720$ or $x=180+2\times360+30$	M1
	$x=930$	A1
		(3)
		Total 4

Question Number	Scheme	Marks
4. (a)	Area $ABCD$ is 40 cm^2 $\Rightarrow 40=6\times10\times\sin\theta$ oe	M1
	$\sin\theta=\frac{2}{3}\Rightarrow\theta=180°-41.8°$	M1
	$\angle DAB=$ awrt $138.19°$	A1
		(3)
(b)	Attempts $DB^2=10^2+6^2-2\times10\times6\cos"138.19°"$	M1
	$DB=$ awrt 15.0 (cm)	A1
		(2)
		(5 marks)

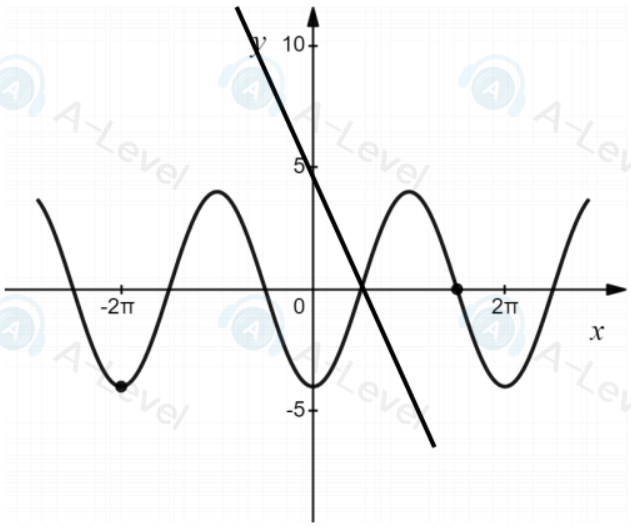
Question Number	Scheme	Marks
6 (a)	$\frac{\sin CAO}{17}=\frac{\sin 0.6}{15}\Rightarrow CAO=0.6944...$	M1
	Angle $COA=\pi-0.6-"0.6944"=1.847$ *	dM1, A1*
		(3)
(b)	Attempts $\frac{1}{2}r^2\theta=\frac{1}{2}\times15^2\times\theta$ where $\theta=(2\pi-1.847)$ or just 1.847 OR	M1
	attempts $\frac{1}{2}ab\sin C=\frac{1}{2}\times15\times17\sin(1.847)$	
	Attempts $\frac{1}{2}r^2\theta=\frac{1}{2}\times15^2\times(2\pi-1.847)(\approx499)$ AND	dM1
	$\frac{1}{2}ab\sin C=\frac{1}{2}\times15\times17\sin(1.847)(\approx122.7)$ AND adds	
	(awrt) 622 m^2	A1
		(3)
(c)	$r\theta=15\times\theta$ where $\theta=(2\pi-1.847)$ or just 1.847 OR	M1
	$(AC^2=)15^2+17^2-2\times15\times17\cos(1.847)(\approx653)$	
	Attempts $r\theta=15\times(2\pi-1.847)(=66.54)$ AND	dM1
	$\{AC=\}\sqrt{15^2+17^2-2\times15\times17\cos(1.847)}$	
	92.1 + 2 = (awrt) 94.1 m	A1
		(3)
		(9 marks)

Question Number	Scheme	Marks
9(a)	$\left(CQ^2 =\right)0.5^2+1.84^2-2\times0.5\times1.84\cos0.8$	M1
	(Radius =) $CQ=1.534\,\text{m}$	A1
		(2)
(b)	$\dfrac{\sin PCQ}{0.5}=\dfrac{\sin 0.8}{"1.534"}$ or $0.5^2="1.534"^2+1.84^2-2\times"1.534"\times1.84\cos PCQ$	M1
	$\Rightarrow \sin PCQ=\dfrac{0.5\sin0.8}{"1.534"}(=0.233....)\Rightarrow PCQ=0.236*$ or $\cos PCQ=\dfrac{"1.534"^2+1.84^2-0.5^2}{2\times"1.534"\times1.84}(=0.972...)\Rightarrow PCQ=0.236*$	A1*
		(2)
(c)	$\dfrac{1}{2}r^2\theta=\dfrac{1}{2}\times"1.534"^2\times\left(2\pi-0.236\right)$ oe e.g. $\pi"1.534"^2-\dfrac{1}{2}\times"1.534"^2\times0.236$ $(=7.114\ldots)$ OR $\dfrac{1}{2}ab\sin C=\dfrac{1}{2}\times0.5\times1.84\sin\left(0.8\right)$ or $\dfrac{1}{2}\times"1.534"\times1.84\sin\left(0.236\right)\left(=0.3299...\right)$	M1
	Attempts $\dfrac{1}{2}r^2\theta=\dfrac{1}{2}\times"1.534"^2\times\left(2\pi-0.236\right)$ **AND** $\dfrac{1}{2}ab\sin C=\dfrac{1}{2}\times0.5\times1.84\sin\left(0.8\right)$ **AND** adds	dM1
	(awrt) 7.4 (m^2)	A1
		(3)
(d)	Attempts $r\theta="1.534"\times\left(2\pi-0.236\right)\left(=9.276...\right)$	M1
	Perimeter = $"1.534"\times\left(2\pi-0.236\right)+0.5+\left(1.84-1.534\right)=10.1$ (m)	A1
		(2)
		(9 marks)

Question	Scheme		Marks
9(i)(a)	$(y=)3\cos(x)$		M1 A1
			(2)
(b)		Same shape translated left or right	B1
		All x intercepts labelled correctly.	B1
		Correct y intercept $\frac{3\sqrt{2}}{2}$	B1
			(3)
(ii)(a)	$(y=)\sin(2x)$		M1 A1
			(2)
(b)		Same shape translated down below the x-axis.	B1
		Correct y intercept -2 labelled.	B1
			(2)
			(9 marks)

Question Number	Scheme	Marks
5(a)	$\angle BOD = \pi - 2\times 0.7 = 1.742*$	B1*
		(1)
(b)	Area of $BOD = \frac{1}{2}\times 3^2 \sin 1.742$ $(=$ awrt $4.43)$	M1
	Area of R is: $\frac{1}{2}\times 3^2 \times 1.742 - \frac{1}{2}\times 3^2 \sin 1.742$ or $\frac{1}{2}\times \pi \times 3^2 - \frac{1}{2}\times 3^2 \sin 1.742 - 2\times \frac{1}{2}\times 3^2 \times 0.7$	dM1
	$=$ awrt 3.4 (m^2)	A1
		(3)
(c)	$BD = \sqrt{3^2+3^2-2\times 3\times 3\cos 1.742}$ $(=$ awrt $4.59)$ or $BD = 2\times 3\sin\left(\frac{1.742}{2}\right)$ or $BD = 2\times 3\cos 0.7$ or $BD = \frac{3\sin 1.742}{\sin\left(\frac{\pi - 1.742}{2}\right)}$ or arc $BCD = 3\times 1.742$ $(=5.226)$	M1
	Perimeter of R is: $3\times 1.742 + "BD"$	dM1
	$=$ awrt 9.8 (m)	A1
		(3)
		Total 7

Question Number	Scheme	Marks
3(a)	$(f(x) =) -3\cos x$ or $(f(x) =) 3\sin(x-90°)$	M1 A1
		(2)
(b)(i)	8	B1
(ii)	5	B1
		(2)
		(4 marks)

Question Number	Scheme	Marks
7 (a)(i)	$P=(-2\pi,-4)$	B1, B1
(ii)	$Q=\left(\frac{3\pi}{2},0\right)$	B1
		(3)
(b) (i)	$k=7$	B1
(ii)	$(2\pi,3)$	M1 A1
		(3)
(c)		M1A1
	One root as there is one point of intersection	**(2)**
		(8 marks)

Question	Scheme	Marks
5(a)	$\frac{1}{2}\times6^2\times1.3=\ldots$	M1
	$=23.4\,(\text{m}^2)$	A1
		(2)
(b)	$12.2^2=6^2+10.8^2-2\times6\times10.8\cos(ABE)$	M1
	$\cos(ABE)=\frac{6^2+10.8^2-12.2^2}{2\times6\times10.8}\left(=\frac{19}{648}\right)$ $ABE=1.54$	A1
		(2)
(c)	$\text{Area } ABE=\frac{1}{2}\times10.8\times6\sin(ABE)$	M1
	$\text{Area } BCD=\frac{1}{2}\times6\cos(\pi-1.3-"1.54")\times6\sin(\pi-1.3-"1.54")$ or e.g. $\text{Area } BCD=\frac{1}{2}\times6\sin(\pi-1.3-"1.54")\times\sqrt{6^2-(6\sin(\pi-1.3-"1.54"))^2}$	M1
	$\text{Total area}=60.9\text{m}^2$	A1
		(3)
		Total 7

Question Number	Scheme	Marks
3(a)	$\left(\mathrm{f}(x)=\right)-3\cos x$ or $\left(\mathrm{f}(x)=\right)3\sin(x-90°)$	M1 A1
		(2)
(b)(i)	8	B1
(ii)	5	B1
		(2)
		(4 marks)

Question Number	Scheme	Marks
8(a)(i)	$2\pi-\frac{2\pi}{3}=\frac{4\pi}{3}$	B1
	Area of sector $=\frac{1}{2}\times3^2\times"\frac{4}{3}\pi"=6\pi$ (m^2)	M1A1
(ii)	Length of arc $=3\times"\frac{4}{3}\pi"\Rightarrow$ Perimeter $=4\pi+6$ (m)	M1A1
		(5)
(b)	$\frac{1}{2}\times3^2\times\sin\left(\frac{2}{3}\pi\right)=\frac{9\sqrt{3}}{4}$ (m^2)	M1A1
		(2)
(c)	Eg $AB^2=3^2+3^2-2\times3\times3\times\cos\left(\frac{2}{3}\pi\right)\Rightarrow AB^2=27\Rightarrow AB=3\sqrt{3}$ (m) *	M1A1*
		(2)
(d)	$\frac{\sin BAC}{8}=\frac{\sin\left(\frac{\pi}{6}\right)}{3\sqrt{3}}\Rightarrow\sin BAC=....$ or $BAC=...$	M1
	$\sin BAC=$ awrt $\frac{4\sqrt{3}}{9}$ or $BAC=$ awrt 0.88 $(0.8785...)$	A1
	Area $ABC=\frac{1}{2}\times3\sqrt{3}\times8\times\sin(\pi-\frac{\pi}{6}-"0.88")$ $(=20.4896....)$	M1
	Total area $=$ "18.8"+"3.90"+"20.5"	dM1
	$=$ awrt 43 (m^2)	A1
		(5)
		(14 marks)

Question Number	Scheme	Marks
4.(a)(i)	$(90,-1)$	B1 B1
(ii)	225	B1
		(3)
(b)	One of $-1<p<0$, $p=1$	M1
	Both $-1<p<0$, $p=1$	A1
		(2)
		(5 marks)