Question Number	Scheme	Marks
6(a)	$A=\frac{1}{2}r^2\theta \Rightarrow 40=\frac{1}{2}r^2\times 2.4\Rightarrow r=...$	M1
	$r=\sqrt{\frac{80}{2.4}}\Rightarrow r=5.77$ (m)	A1
		(2)
(b)	States or uses that angle *AOB* = awrt 0.37	B1
		(1)
(c)	$\frac{1}{2}\times "5.77"\times 6.25\times \sin "0.37"\ \left(=6.5377...\right)$	M1
	Full method for area of stage = $40+2\times\frac{1}{2}\times 5.77\times 6.25\times \sin 0.37$	dM1
	= 53.1 m^2	A1
		(3)
(d)	$r\theta = "5.77"\times 2.4 = \left(13.848\right)$	M1
	$x^2=6.25^2+"5.77"^2-2\times 6.25\times "5.77"\cos "0.37"\qquad \left(x=2.26\right)$	M1
	Full method for perimeter of stage = $12.5+2\times "2.26"+"5.77"\times 2.4$	ddM1
	= 30.9 m	A1
		(4)
		(10 marks)

Allow equivalent correct work in degrees but part (b) must be in radians.

(a)

M1: Attempts to use $A=\frac{1}{2}r^2\theta$ with A = 40 and θ = 2.4 to find a value for r

A1: Achieves awrt 5.77 (m). Apply isw if necessary e.g. if they subsequently write 5.77 as 5.8.

(b)

B1: Angle *AOB* = awrt 0.37. Allow this to score anywhere in their answer.

(c)

M1: Attempts area of triangle *AOB* (or triangle *DOC*) $\frac{1}{2}\times "a"\times 6.25\times \sin "b"$ (May be seen "doubled")

NB: "doubled" is 13.075…

dM1: Attempts area of stage $40+2\times\frac{1}{2}\times "a"\times 6.25\times \sin "b"$

or e.g. $\frac{1}{2}\times "5.77"^2\times 2.4+2\times\frac{1}{2}\times "a"\times 6.25\times \sin "b"$

A1: Awrt 53.1 (m^2). Condone awrt 53.0 but not just 53 unless awrt 53.1 or awrt 53.0 is seen earlier.

(d)

M1: Attempts $r\theta = "a" \times 2.4$

M1: Attempts to use the cosine rule to find length AB or AB^2 (or CD/CD^2) (Allow anywhere in their solution)

e.g. $x^2 = 6.25^2 + "a"^2 - 2 \times 6.25 \times "a" \cos "b"$

ddM1: Full method to find perimeter of stage $12.5 + 2 \times AB + "a" \times 2.4$

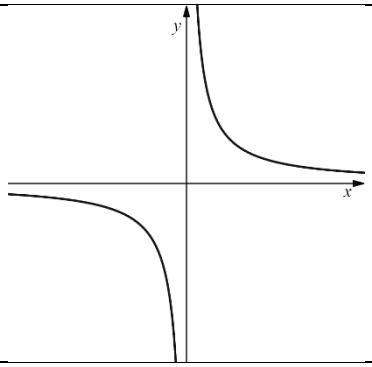
It must be clear they are using AB not AB^2

Depends on both previous M marks.

A1: Awrt 30.9 (m)

Beware in (d): $AB = 6.25 \sin(0.37) = 2.26...$ erroneously and will lead to the correct answer 30.9

Generally, this will score M1M0ddM0A0 if the arc length calculation is correct.

Question Number	Scheme		Marks
7(a)		Correct Shape in quadrant 1 or 3	M1
		Fully correct shape and position	A1
			(2)
(b)	E.g. Translate 2 (units) to the right (parallel to the *x*-axis)		B1, B1
			(2)
(c)	When $x=-4 \Rightarrow \frac{6}{x-2}=kx+7 \Rightarrow \frac{6}{-6}=-4k+7 \Rightarrow k=...$		M1
	$k=2$		A1
			(2)
(d)	$\frac{6}{x-2}="2"x+7 \Rightarrow 6=2x^2+3x-14$		M1
	$0=2x^2+3x-20 \Rightarrow (2x-5)(x+4)=0$		dM1
	$Q=\left(\frac{5}{2},12\right)$		A1, A1
			(4)
			(10 marks)

(a)

M1: For a monotonically decreasing function in quadrant 1 or 3 with no incorrect asymptotes in that quadrant.

It must not cross either axis but be tolerant of functions that don't go up or down as far as the *x*-axis and as far left or right as the *y*-axis.

The "ends" should not come back away from the axes significantly but be tolerant of "wobbles".

A1: Correct shape and position with no incorrect asymptotes.

Remember to check both diagrams and score the best single attempt if both are used.

(b)

B1: Partial description that implies at least one of the two components but is not fully correct

E.g. "Translates 2 units left", "Shifts/moves 2 units right"

B1: Requires (1): Translate/translation **and** (2): $\begin{pmatrix}2\\0\end{pmatrix}$ or "2 (units to the) right" or e.g. "+2 in the *x* direction"

A minimum could be e.g.: "Translate +2 on *x*"