Question			Answer	Marks	AO	Guidance	
9	(a)		$R^2 = 9 + 49$	M1	1.1a	Attempt correct process to find R	
			$R\cos\alpha = 3$, $R\sin\alpha = 7$ hence $\tan\alpha = \frac{7}{3}$	M1	1.1a	Attempt correct process to find $\tan\alpha$ (or equiv with $\sin\alpha$ or $\cos\alpha$)	M0 for $\tan\alpha = \frac{3}{7}$ Allow M1 even if then evaluated in degrees
			$\sqrt{58}\cos(3x - 1.17)$	A1 [3]	1.1	Obtain $\sqrt{58}\cos(3x - 1.17)$	Allow $R = 7.62$, or better α must be in radians If R and α are correct then no need to see them substituted back into the expression
	(b)		Stretch in the y direction by sf $\sqrt{58}$	B1FT	1.1	Follow through their R (numerical or just 'R') Given at any point in the sequence of transformations	Allow BOD if no 'scale factor' or equiv ie B1 for 'stretch in y –direction by $\sqrt{58}$ ' Must be 'parallel to y-axis', 'in y direction', 'x-axis invariant' or equiv, so B0 for 'along / in / on / to y-axis', 'parallel to y' etc
			Translation in the x direction by 1.17 Stretch in the x direction by sf $\frac{1}{3}$	M1	3.1a	Translation by ± their α and stretch by (sf) 3 or $\frac{1}{3}$, in either order, both in the x direction	Allow informal language for this mark eg 'shift', 'move', 'compression', 'squash' Allow translation by $\pm\frac{1}{3}$ (their α)
				A1FT	1.1	Translation by their α (numerical, inc in degrees, or just 'α')	soi to be in the positive x-direction Must use correct language (see B1FT)
				A1 [4]	2.5	Stretch by sf $\frac{1}{3}$	A0A1 is possible For A1A1 stretch must follow translation, unless using $\frac{1}{3}$ (their α) Must use correct language (see B1FT) Must mention 'scale factor', 'factor' or 'sf'

Question			Answer	Marks	AO	Guidance	
	(c)		greatest value is $\sqrt{58}$	**B1FT**	**3.1a**	FT their R	R must be numerical Allow no method shown
			when $x = 0.389$	**B1** **[2]**	**1.1**	Obtain 0.389	Must be in radians 'Determine' so some method needed eg $3x - 1.17 = 0$ oe (minimum of $x = \frac{1.17}{3}$) Allow 0.39
	(d)		least value is $-\sqrt{58}$	**B1FT**	**3.1a**	FT their R	R must be numerical Allow no method shown
			when $x = 1.44$	**B1** **[2]**	**1.1**	Obtain 1.44	Must be in radians 'Determine' so some method needed eg $3x - 1.17 = \pi$, or equiv
10	**(a)**		$\frac{1}{2} \times 6^2 \times \theta$	**B1**	**1.2**	Correct area of sector soi	Could be part of attempt at area of segment Allow unsimplified, inc $\pi \times 6^2 \times \frac{\theta}{2\pi}$
			$\frac{1}{2} \times 6^2 \times (\theta - \sin\theta) = 7.2$	**M1**	**1.1**	Attempt area of segment and equate to 7.2	Any equivalent method eg sector area = triangle area + 7.2 Correct formula for area of a triangle Area of sector must be $\left(\frac{1}{2}\right) \times 6^2 \times \theta$
			$\theta - \sin\theta = \frac{7.2}{18} = 0.4$ $\theta = 0.4 + \sin\theta$ **AG**	**A1** **[3]**	**2.1**	Rearrange to obtain given answer	At least one line of working needed after equating to 7.2