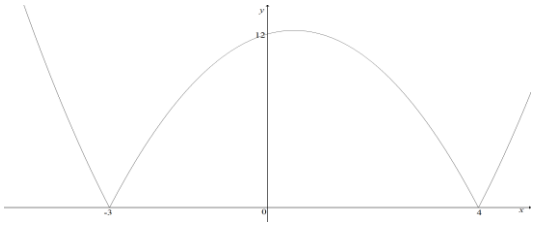
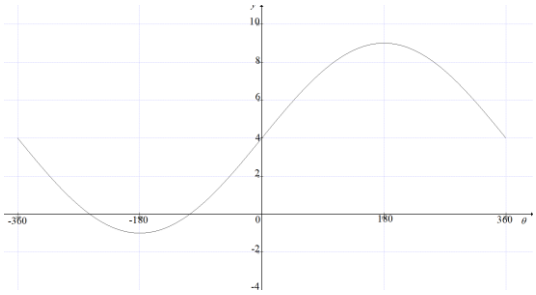
Question	Answer	Marks	Guidance
1(a)	$y = x^2 - x - 12$ $\frac{dy}{dx} = 2x - 1$ or $(x+3)+(x-4)$ or $y = \left(x - \frac{1}{2}\right)^2 - \frac{49}{4}$ or using symmetry $x = \frac{4-3}{2}$	**M1**	For expanding the brackets and differentiate with at least one correct term or for using the product rule or for completing the square or for using symmetry
	$x = \frac{1}{2}$	**A1**	
	$y = -\frac{49}{4}$ oe	**A1**	
1(b)		**2**	**B1** for the correct shape. Must have the parabola part of the curve with maximum in the first quadrant and cusps on the *x*-axis. Ignore labelling of their maximum point if incorrect coordinates **B1** for correct intercepts. Must be correct shape
1(c)	$k > \frac{49}{4}$ oe	**B1**	**FT** on $\left\lvert \textit{their } -\frac{49}{4} \right\rvert$ excluding $k > 12$
2		**4**	**B1** for correct shape must be a curve with one min in 3rd quadrant and one max in first quadrant and correct endpoints $(-360, 4)$ and $(360, 4)$ Ignore labelling of their maximum point if incorrect coordinates. **depB1** for intercept of 4 on *y*-axis. Must have the correct shape **depB1** for max in correct position of $(180^o,\ 9)$. Must have the correct shape **depB1** for min in correct position of $(-180^o,\ -1)$. Must have the correct shape
3	$4x^2 - 4kx - k + 2 [= 0]$	**B1**	soi
	$k^2 + k - 2$ Critical values $-2,\ 1$	**2**	**M1** for use of discriminant on *their* three-term quadratic equation to obtain two critical values
	$-2 < k < 1$	**A1**	Strict inequality