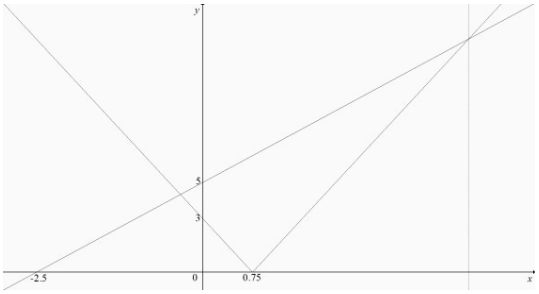
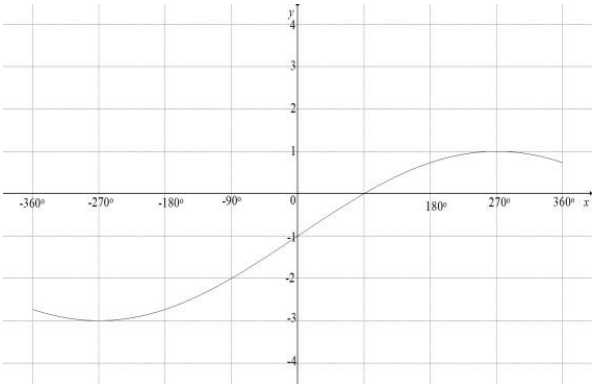
Question	Answer	Marks	Guidance
1(a)		**3**	**B1** for a V shaped graph with a vertex on the positive x-axis. **B1** for 0.75 and 3 marked correctly and **dependent** on first B1 **B1** for a straight line passing through -2.5 and 5 marked correctly, axis with a gradient such that there are two points of intersection. The second point of intersection may be implied.
1(b)	$4x-3<2x+5$ so $x<4$	**B1**	
	$2x+5>-4x+3$ so $x>-\frac{1}{3}$	**B1**	**nfww**
	$-\frac{1}{3}<x<4$	**B1**	Dependent on both B1 **SC2** for the values $-\frac{1}{3}$ and 4 without any or with wrong inequality signs **nfww**
	Alternative		
	$3x^2-11x-4<0$ or = 0	**(M1)**	For squaring each side of the inequality and forming a 3-term quadratic. Allow multiples.
	$-\frac{1}{3}$, 4	**(A1)**	Critical values
	$-\frac{1}{3}<x<4$	**(A1)**	
2	Mid-point $\left(\frac{3}{2},-\frac{5}{6}\right)$	**B1**	Do not allow if unsimplified
	Gradient $=-\frac{1}{3}$	**B1**	Allow unsimplified
	$k+\frac{5}{6}=3\times\left(2-\frac{3}{2}\right)$ oe	**M1**	For attempt at perpendicular bisector **Must** be with *their* perpendicular gradient and *their* mid-point
	$k=\frac{2}{3}$	**A1**	

Question	Answer	Marks	Guidance
3		**4**	**B1** for a correct shape, starting in approximately correct places between -2 and -3 and finishing in approximately correct places between 0 and 1, having an amplitude of 2 and crossing the x-axis only once, on the positive x-axis. **B1** for a correct shape and $(0, -1)$ **B1** for a correct shape and a max and a min in approximately correct places. $(270^\circ, 1)$ and $(-270^\circ, -3)$ **B1** for a correct shape crosses at $(90^\circ, 0)$
4(a)	$P\left(-\frac{1}{2}\right): -\frac{a}{8}+\frac{b}{4}-\frac{3}{2}+2=0$	**M1**	Allow one arithmetic error. **Must** be equated to 0 soi Allow unsimplified
	$P(-1): -a+b-3+2=-6$	**M1**	Allow unsimplified **Must** be equated to -6 soi
	$-a+2b+4=0$ oe $-a+b+5=0$ oe	**A1**	For both allow unsimplified
	$a=6, \quad b=1$	**2**	**M1 dep** on at least one previous M1 for attempt to solve *their* simultaneous equations to find at least one of *their* unknowns. **A1** for both.
4(b)	$(2x+1)(3x^2-x+2)$	**2**	**M1** for correct attempt to obtain 2 terms of the quadratic for *their* P(x). Must divide by $(2x + 1)$ **A1** for correct quadratic $(3x^2-x+2)$
	For $3x^2-x+2$, the dicriminant is <0 so only one real root of $-\frac{1}{2}$ oe	**B1**	Must have a valid attempt to evaluate the discriminant.
5(a)(i)	30 240	**B1**	
5(a)(ii)	720	**B1**	the number of passwords with no symbols. Not part of a product
	29 520	**B1**	
5(a)(iii)	$(6\times5)\times6\times(4\times3)=2160$ oe	**2**	**B1** for (6×5) and (4×3) soi