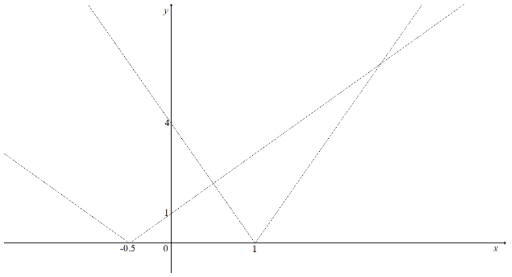
Question	Answer	Marks	Guidance
4(b)(i)		**3**	**B1** for 2 V shapes which intersect twice in the first quadrant, with vertices on the x-axis, must be straight lines, not curves. **B1** for –0.5 and 1 on the x-axis **B1** for 1 and 4 on the y-axis
4(b)(ii)	$2x + 1 = 4(x - 1)$	**M1**	For attempt to solve to get $x =$
	$x = 2.5$	**A1**	
	$2x + 1 = -4(x - 1)$ oe	**M1**	For attempt to solve to get $x =$
	$x = 0.5$	**A1**	
	Alternative $4x^2 + 4x + 1 = 16x^2 - 32x + 16$	**(M1)**	For attempt to square each equation and equate
	$12x^2 - 36x + 15 = 0$ oe	**(M1)**	Dep on previous M mark for attempt to simplify to a 3-term quadratic equation, equated to zero and attempt to solve
	$x = 2.5 \quad x = 0.5$	**(A2)**	**A1** for each
5(a)	$\begin{pmatrix} -7.5 \\ 4 \end{pmatrix}$ or $-\frac{1}{2}\begin{pmatrix} 15 \\ -8 \end{pmatrix}$ oe	**2**	**B1** for $\begin{pmatrix} 7.5 \\ -4 \end{pmatrix}$ oe or **B1** for $\begin{pmatrix} -15 \\ 8 \end{pmatrix}$
5(b)	$15a + 2a + 1 = 6b + 6a$ $5b + 2 = 2$	**M1**	For equating like vectors in order to obtain at least one equation
	$a = 1, b = 2$	**2**	**Dep M1** for attempt to solve both equations **A1** for both
6(a)	$k = 14$	**B1**	
	$k = 6$	**B1**	

Question	Answer	Marks	Guidance
6(b)(i)	$\dfrac{(1+\tan\theta)(1+\cos\theta)+(1-\tan\theta)(1-\cos\theta)}{1-\cos^2\theta}$	**M1**	Allow $(1+\cos\theta)(1-\cos\theta)$ in the denominator
	Expansion of numerator and simplification of denominator	**M1**	**Dep** on previous M mark
	Use of $\tan\theta\cos\theta = \sin\theta$	**B1**	soi
	$\dfrac{2(1+\sin\theta)}{\sin^2\theta}$	**A1**	Sufficient simplification to justify obtaining the given answer
6(b)(ii)	$2(1+\sin\theta) = 3\sin^2\theta$ $3\sin^2\theta - 2\sin\theta - 2 = 0$	**M1**	For use of part **(a)** and attempt to simplify to a 3-term quadratic equation equated to zero.
	$\sin\theta = \dfrac{1-\sqrt{7}}{3}$ or –0.5485…	**M1**	**M1** for attempt to solve and obtain a value for θ, may be implied by one correct solution
	213.3° and 326.7°	**A2**	**A1** for one solution If 0 scored **SC1** for awrt 213 and 327 Penalise excess solutions in the range
7(a)	Common difference = $2\lg 3$	**B1**	Must be exact
	$\dfrac{n}{2}(2\lg 3 + (n-1)2\lg 3) = 256\lg 81$ or $\dfrac{n}{2}(\lg 9 + (n-1)\lg 9) = 512\lg 9$	**M1**	For use of the sum formula
	$\lg 81 = 4\lg 3$ soi or $\lg 81 = 2\lg 9$ soi	**B1**	Allow when working with decimal
	$n^2 = 1024$ oe	**M1**	Dep on first M mark, for attempt to simplify the sum equation by dividing through by $\lg 3$ oe to obtain an equation in n only
	$n = 32$ cao	**A1**	Must have exact working through out
7(b)	$\ln 256 = 4\ln 4$, $\ln 16 = 2\ln 4$ oe	**M1**	For use of power rule to obtain the common ratio
	Common ratio = 0.5	**A1**	
	$S_\infty = \dfrac{4\ln 4}{1-\textit{their } r}$ oe	**M1**	Allow $\ln 256$ for first term and *their r* provided it is positive and < 1
	$16\ln 2$	**A1**	