Question		Answer	Marks	AO	Guidance	
6	(a)	$u_1 = a = 2\sin\theta, u_3 = a + 2d = -\sqrt{3}\cos\theta$ and $u_4 = a + 3d = \frac{7}{2}\sin\theta$			**For reference**	
		$d = \frac{7}{2}\sin\theta + \sqrt{3}\cos\theta$	**B1***	**2.1**	Forming a correct expression for d (or a correct equation containing d) e.g. $(d =)\frac{1}{2}(-\sqrt{3}\cos\theta - 2\sin\theta)$, $(d =)\frac{1}{3}(\frac{7}{2}\sin\theta - 2\sin\theta)(= 0.5\sin\theta)$ Can be implied e.g. $\frac{7}{2}\sin\theta = 2\sin\theta + 3(...)$ seen	Can be implied by a correct equation for θ
		$-\sqrt{3}\cos\theta = 2\sin\theta + 2(\frac{7}{2}\sin\theta + \sqrt{3}\cos\theta) \Rightarrow \tan\theta = -\frac{\sqrt{3}}{3}$	**M1dep***	**3.1a**	Obtaining an equation of the form $\tan\theta = k$ from a trigonometric equation which initially had 3 sine and 1 cosine terms **or** 2 sine and 2 cosine terms e.g. **if** correct $\frac{7}{2}\sin\theta = 2\sin\theta + 3(\frac{7}{2}\sin\theta + \sqrt{3}\cos\theta)$	
		$\theta = \frac{5}{6}\pi$	**A1**	**2.2a**	Condone $-\frac{\pi}{6}$ stated too but **A0** if any other value given in the interval $\frac{1}{2}\pi < \theta < \pi$ (but ignore any values that are given outside this range)	Exact answer must be seen at some stage
			[3]			

Question		Answer	Marks	AO	Guidance	
6	(b)	$S_{100} = \frac{100}{2}[2(2\sin\theta) + (100-1)d]$	B1ft	1.2	Correct formula for the sum of an AP with $a = 2\sin\theta$ (with either θ or their value of θ substituted) **and** either d **or** their value of d substituted **or** their expression for d	Follow through their values of θ and d if used provided $\frac{100}{2}[2(2\sin\theta) + (100-1)d]$ implied
		$d = \frac{7}{2}\sin(\frac{5}{6}\pi) + \sqrt{3}\cos(\frac{5}{6}\pi)$ $(= \frac{1}{4})$	B1ft	1.1	Correct expression for d **using their** θ (e.g. $d = \frac{1}{2}(-\sqrt{3}\cos\theta - 2\sin\theta)$, $d = \frac{1}{3}(\frac{7}{2}\sin\theta - 2\sin\theta)$)	Follow through their value of θ **only**
		$S_{100} = 1337.5$	B1	2.2a	**www** – must have come from $\theta = \frac{5}{6}\pi$ correctly derived in **(a)** oe (not for 1338 or 1340 unless 1337.5 seen so isw once 1337.5 (oe e.g. $\frac{2675}{2}$) seen)	**Correct answer with no working scores all 3 marks**
			[3]			