Question	Answer	Marks	Guidance
8(a)(ii)	$\cos^2\theta = \frac{3}{4}$	**B1**	For relating to and making use of **(a)**
	$\cos\theta = \pm\frac{\sqrt{3}}{2}$	**M1**	For attempt to solve, may be implied by one correct solution
	$\theta = -150^\circ,\ -30^\circ,\ 30^\circ,\ 150^\circ$	**2**	**A1** for any correct pair **A1** for a second correct pair and no extra solutions within the range
8(b)	$\tan\left(3\phi + \frac{2\pi}{3}\right) = 1$	**B1**	
	$3\phi + \frac{2\pi}{3} = \frac{\pi}{4},\ \frac{5\pi}{4},\ \frac{9\pi}{4}$ $3\phi = \frac{7\pi}{12},\ \frac{19\pi}{12}$	**M1**	For correct order of operations
	$\phi = \frac{7\pi}{36}$	**A1**	
	$\phi = \frac{19\pi}{36}$	**A1**	
9(a)	$\left[\ln x - \frac{1}{2}\ln(2x+3)\right]_1^a$	**2**	**B1** for $\ln x$ **B1 f**or $\frac{1}{2}\ln(2x+3)$
	$\ln a - \frac{1}{2}\ln(2a+3) + \frac{1}{2}\ln 5$	**M1**	For correct application of limits, must have at least one **B1**
	$\ln a\sqrt{\frac{5}{2a+3}}$	**M1**	**Dep** on previous M mark, for application of log laws
	$5a^2 - 18a - 27 = 0$	**M1**	**Dep** on previous M mark for equating to $\ln 3$ and simplification to a 3 term quadratic = 0
	$a = \frac{9+6\sqrt{6}}{5}$	**A1**	Must have one solution only

Question	Answer	Marks	Guidance
9(b)	$-\frac{1}{2}\cos\left(2x+\frac{\pi}{3}\right)+\frac{1}{2}\sin 2x-x$	**3**	**B1** for $-\frac{1}{2}\cos\left(2x+\frac{\pi}{3}\right)$ **B1** for $+\frac{1}{2}\sin 2x$ **B1** for $-x$
	$\left(-\frac{1}{2}\cos\pi+\frac{1}{2}\sin\frac{2\pi}{3}-\frac{\pi}{3}\right)$ $-\left(-\frac{1}{2}\cos\frac{\pi}{3}\right)$	**M1**	For correct use of limits in *their* integral, must have at least one **B1** term
	$\frac{3}{4}+\frac{\sqrt{3}}{4}-\frac{\pi}{3}$	**A1**	
10(a)	$a+d=8$ $a+3d=18$	**2**	**B1** for both equations **M1** for attempt to solve *their* equations
	$a=3,\ \ d=5$	**A1**	For both
	$\frac{n}{2}\left(6+(n-1)5\right)>1560$	**M1**	For correct use of sum formula with *their a* and *d*, allow equality
	$5n^2+n-3120>0$	**M1**	For attempt to solve, allow equality, to obtain at least one critical value
	Positive critical value 24.9 25terms	**A1**	
10(b)(i)	$\frac{a}{1-r}=72$ and either $a+ar+ar^2=\frac{333}{8}$ or $\frac{a\left(1-r^3\right)}{1-r}=\frac{333}{8}$	**B1**	For both
	$a=72(1-r)$ and $a\left(1+r+r^2\right)=\frac{333}{8}$ oe $72(1-r)\left(1+r+r^2\right)=\frac{333}{8}$ or $72\left(1-r^3\right)=\frac{333}{8}$	**M1**	For attempt to obtain an equation in terms of *r* only
	$1-r^3=\frac{333}{576}$	**A1**	
	$r=0.75$	**2**	**M1** for attempt to solve *their* equation in *r*