Question	Answer	Marks	Guidance
10(a)(i)	$a+d=14$ soi	**B1**	
	$a(a+d)(a+2d)=-6720$	**B1**	
	$a\times14\times(a+2d)=-6720$, leading to $a(a+2d)=-480$	**B1**	**Dep** on both previous **B** marks **AG**, needs sufficient detail
10(a)(ii)	$(14-d)(14+d)=-480$ or $a(28-a)=-480$	**M1**	For attempt to obtain a quadratic equation in one variable
	$d^2=676$ or $a^2-28a-480=0$	**A1**	
	$a=40,\ d=-26$	**A2**	**A1** for each
10(b)	$ar^2=\dfrac{e^{4x}}{4}$	**B1**	
	$ar^9=\dfrac{e^{11x}}{512}$	**B1**	
	$r^7=\dfrac{e^{7x}}{128}$ oe	**M1**	For a correct attempt to solve *their* 2 equations. Must be the same structure to obtain $r^7=...$
	$r=\dfrac{e^x}{2}$	**A1**	
	$a=e^{2x}$	**A1**	

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Question	Answer	Marks	Guidance
11	$12\log_{81} y = 3\log_3 y$ oe or $4\log_9 x = 2\log_3 x$ oe	**B1**	For either
	$8\log_3 x + 3\log_3 y = 5$ oe	**B1**	
	$2\log_3 x + 3\log_3 y = 2$ oe	**B1**	
	$y = 3^{\frac{1}{3}}, x = \sqrt{3}$	**3**	**M1** for attempt to solve *their* equations. Must have at least 2 **B** marks and obtain 2 solutions **A1** for each
	Alternative		
	$12\log_{81} y = \dfrac{\log_3 y^{12}}{4}$ oe or $4\log_9 x = \dfrac{\log_3 x^4}{2}$ oe	**B1**	
	$x^{32}y^{12} = 3^{20}$ or $x^8y^3 = 3^5$ oe	**B1**	
	$x^4y^6 = 3^4$ or $x^2y^3 = 3^2$ oe	**B1**	
	$y = 3^{\frac{1}{3}}, x = \sqrt{3}$	**3**	**M1** for attempt to solve *their* equations, which must both be in the correct form. Must have at least 2 **B** marks and obtain 2 solutions **A1** for each
12	$\cos\left(3\theta - \dfrac{\pi}{2}\right) = \dfrac{1}{2}$ oe soi	**B1**	
	$\theta = -\dfrac{7\pi}{18}, \dfrac{\pi}{18}, \dfrac{5\pi}{18}$	**4**	**M1 dep** on previous **B** mark, for one of the following $3\theta - \dfrac{\pi}{2} = -\dfrac{5\pi}{3}, -\dfrac{\pi}{3}, \dfrac{\pi}{3}, \dfrac{5\pi}{3}$ **A1** for one correct solution **A1** for a second correct solution **A1** for a third correct solution and no extra solutions in the range.

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