Question	Answer	Marks	Partial Marks
10(a)	$a^n = b^4$ and $na^{n-1}\left(\frac{1}{a}\right) = 48b^3$ oe	**M1**	
	Eliminates b from one equation using the other equation e.g. $\frac{a^{n-2}}{a^{\frac{3}{4}n}} = \frac{48}{n}$	**M1**	**dep** previous **M1**
	Simplifies a terms e.g. $a^{\frac{n}{4}-2} = \frac{48}{n}$ or $a^{\frac{3n}{4}-6} = \left(\frac{48}{n}\right)^3$	**A1**	
	Uses an appropriate power and completes to the given form e.g. $\left(a^{\frac{n}{4}-2}\right)^2 = \left(\frac{48}{n}\right)^2$ or $\left(a^{\frac{3n}{4}-6}\right)^{\frac{2}{3}} = \left(\frac{48}{n}\right)^{3\times\frac{2}{3}}$ → $a^{\frac{n}{2}-4} = \left(\frac{48}{n}\right)^2$	**A1**	
10(b)	Correct equation in a, b, n $\frac{n(n-1)}{2} \times a^{n-2} \times \frac{1}{a^2} = 1056b^2$ oe, soi	**M1**	
	Correct equation in a, n $\frac{n(n-1)}{2} \times a^{n-2} \times \frac{1}{a^2} = 1056a^{\frac{n}{2}}$ oe	**A1**	
	$\left[\frac{n(n-1)}{2} \times a^{\frac{n}{2}-4} = 1056 \text{ oe} \rightarrow\right]$ Correct equation in n only $\frac{n(n-1)}{2} \times \left(\frac{48}{n}\right)^2 = 1056$ oe	**A1**	
	$n^2 - 12n = 0$ or $n - 12 = 0$ oe	**A1**	
	$n = 12$ only	**A1**	
	$a = 4$ only and $b = 64$ only	**A1**	

© Cambridge University Press & Assessment 2024

Question	Answer	Marks	Partial Marks
11	$\frac{dS}{dt} = \frac{dS}{dr} \times \frac{dr}{dt}$ or $\frac{dS}{dr} = 6$ soi	**B1**	
	$S = 2\pi r(4r)$ or $8\pi r^2$	**B1**	
	$16\pi r = 6$	**M1**	**FT** *their* $S = k\pi r^2$ with k a positive integer to give $2k\pi r = 6$
	$r = \frac{6}{16\pi}$ oe, isw	**A1**	
	$S = \frac{9}{8\pi}$ oe, isw	**A1**	

© Cambridge University Press & Assessment 2024