Question	Answer	Marks	Partial Marks
9(d)(ii)	$V = \frac{1}{3}\pi\left(\frac{3}{4}h\right)^2 \times h$ oe	**B1**	**FT** *their r = kh* where *k* is a positive constant e.g. $V = \frac{1}{3}\pi\left(their\ kh\right)^2 \times h$
	$\frac{dV}{dh} = \frac{9\pi h^2}{16}$ oe	**B1**	**FT** *their k* where *k* is a positive constant e.g. $\frac{dV}{dh} = \left(their\ k\right)^2 \pi \times h^2$
	Relevant, correct chain rule **including** $\frac{dh}{dt}$ soi $\frac{dh}{dt} = \frac{dV}{dt} \times \frac{dh}{dV}$ oe	**B1**	e.g. $\frac{dh}{dt} = \frac{dV}{dt} \div \frac{dV}{dh}$
	$27 \times \frac{16}{9\pi \times 16}$ oe	**M1**	
	0.955 or 0.9549[29…]	**A1**	
10(a)(i)	$[v =] \frac{t^3}{3} - 2t \quad (+c)$	**M1**	Or $\left[\frac{t^3}{3} - 2t\right]_{[3]}^{[4]}$
	$[v =] \frac{t^3}{3} - 2t - \frac{10}{3}$	**A1**	Or substituting in limits $\left(\frac{4^3}{3} - 2\times 4\right) - \left(\frac{3^3}{3} - 2\times 3\right) - \frac{1}{3}$
	$v = 10$	**A1**	
10(a)(ii)	2 correct terms in $[s =] \frac{t^4}{12} - t^2 - \frac{10}{3}t\,(+d)$	**M1**	**FT** an expression in form $at^3 + bt$ Or 2 correct terms in $\left[\frac{t^4}{12} - t^2 - \frac{10}{3}t\right]_{[3]}^{[4]}$ 1
	$s = \frac{t^4}{12} - t^2 - \frac{10}{3}t + 12$	**A1**	**A1** substituting in limits $\left(\frac{4^4}{12} - 4^2 - \frac{10}{3}\times 4\right) - \left(\frac{3^4}{12} - 3^2 - \frac{10}{3}\times 3\right) - \frac{1}{4}$
	$s = 4$	**A1**	

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Question	Answer	Marks	Partial Marks
10(b)	$[v=]19t+\frac{5}{2}e^{8-2t}(+c)$ oe	**M1**	
	$[v=]19t+\frac{5}{2}e^{8-2t}-\frac{137}{2}$ oe	**A1**	**FT** (*their* 10) – 78.5
	$[s=]\frac{19t^2}{2}-\frac{5}{4}e^{8-2t}-\frac{137}{2}t(+d)$ oe	**M1**	**dep** on previous **M1** **FT** *their* $-\frac{137}{2}$ provided not 0 or algebraic
	$[s=]\frac{19t^2}{2}-\frac{5}{4}e^{8-2t}-\frac{137}{2}t+\frac{509}{4}$ oe, cao	**A1**	
	s = 392 or 392.2[49…]	**A1**	
11(a)	$ar+ar^2=168$ or $ar^3+ar^4=94.5$ oe soi	**B1**	
	$\frac{ar^3(1+r)}{ar(1+r)}=\frac{94.5}{168}$ oe	**M1**	Correct equation where a can be directly eliminated
	$168r^2 = 94.5$ oe	**M1**	
	$r=\frac{3}{4}$ only nfww	**A1**	
	$\frac{3}{4}a+\frac{9}{16}a=168$ oe	**M1**	**FT** *their r*
	a = 128	**A1**	
	$u_6=\frac{243}{8}$ only oe, isw	**B1**	
11(b)	512	**B1**	

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