Question	Answer	Marks	Guidance
7(a)	$\left(a=\right)\dfrac{\mathrm{d}v}{\mathrm{d}t}=0.5$	**B1**	For acceleration during the first 10 seconds
	Differentiate to get $\left(a=\right)\dfrac{\mathrm{d}v}{\mathrm{d}t}=2\times0.25t-8 \quad \left[=0.5t-8\right]$	**B1**	Allow unsimplified
	$a\left[=0.5\times10-8\right]=-3$	**B1**	CWO. Do not award final B mark if more than 2 accelerations seen and not discarded, 2/3 maximum Ignore any comments, correct or incorrect
		3	

Question	Answer	Marks	Guidance
(b)	Get distance in first 10 seconds as 25	**B1**	From suvat or from $\int_0^{10} 0.5t\,\mathrm{d}t$
	$v=0$ when $t=12$ and $t=20$	**B1**	SOI
	Attempt to integrate v $\left[s=\int\left(0.25t^2-8t+60\right)\mathrm{d}t\right]$	***M1**	For integration, the power of t must increase by 1 in at least 1 term with a change of coefficient in the same term. $s=vt$ is M0
	$s=\frac{0.25}{3}t^3-\frac{8}{2}t^2+60t\left(+c\right)$ $\left[=\frac{1}{12}t^3-4t^2+60t\left(+c\right)\right]$	**A1**	Allow unsimplified
	Attempt to evaluate their $\left[\frac{1}{12}t^3-4t^2+60t\right]$ for $t=10$ to $t=12$ and $t=12$ to $t=20$	**DM1**	Using the correct limits correctly
	$s=\left[25+288-\frac{850}{3}-\left(\frac{800}{3}-288\right)=25+\frac{14}{3}-\left(-\frac{64}{3}\right)\right]=51$ m	**A1**	

Question	Answer	Marks	Guidance
(b)	**Special Case for those who use a calculator to integrate. Maximum 4/6**		
	Get distance in first 10 seconds as 25	**B1**	From suvat or $\int_0^{10} 0.5t\,\mathrm{d}t$
	$v=0$ when $t=12$ and $t=20$	**B1**	SOI
	Either $s=\int_{10}^{12}\left(0.25t^2-8t+60\right)\mathrm{d}t=\frac{14}{3}=4.67$ Or $s=\left\|\int_{12}^{20}\left(0.25t^2-8t+60\right)\mathrm{d}t\right\|=\frac{64}{3}=21.3$	**B1**	Allow $\int_{10}^{20}\left\|0.25t^2-8t+60\right\|\mathrm{d}t=26$
	$s=\left[25+\frac{14}{3}+\frac{64}{3}\right]=51$ m	**B1**	Allow if $t=12$ and $t=20$ not found for 3 marks
		6	