

Question	Scheme	Marks	AOs
6 (a)	Attempts to use $h = A - B t^{1.5}$ to form one correct equation with either $17.6 = A - B \times 4^{1.5}$ or $11.9 = A - B \times 9^{1.5}$	M1	3.1b
	Correct equations $A - 8B = 17.6$ $A - 27B = 11.9$	A1	1.1b
	Solves simultaneously to find values for A and B	dM1	1.1b
	$h = 20 - 0.3 t^{1.5}$	A1	3.3
		(4)	
(b)	20 metres	B1ft	3.2a
		(1)	
(c)	$0 = 20 - 0.3 T^{1.5} \left(\Rightarrow T^{1.5} = \frac{200}{3} \right) \Rightarrow T = \dots$	M1	3.4
	$(T =) 16.4$	A1	1.1b
		(2)	

(7 marks)

Notes:			
(a)			
M1:	Forms one correct equation either $17.6 = A - 8B$ or $11.9 = A - 27B$ May be unsimplified e.g. $17.6 = A - B \times 4^{1.5}$ or $11.9 = A - B \times 9^{1.5}$		
A1:	$17.6 = A - 8B$ and $11.9 = A - 27B$ which may be unsimplified		
dM1:	Solves simultaneously to find values for A and B . It is dependent on the previous method mark so at least one equation must be correct. Do not be concerned with the process as calculators may be used. Score if values for A and B are reached from a pair of simultaneous equations.		
A1:	$h = 20 - 0.3 t^{1.5}$ o.e. e.g. $t = \left(\frac{10}{3} (20 - h) \right)^{\frac{2}{3}}$ isw once a correct equation is found. Requires the complete equation including $h = \dots$ Just stating the values for A and B is A0 but allow A1 to be scored if the correct equation is seen in (b) or (c)		
(b)			
B1ft:	20 metres but ft on their A metres (provided $A > 0$). Condone if they have a value for A which is given to a greater degree of accuracy than 3sf but they round this to 3sf or better in (b). Requires units as well (allow m for metres)		

(c) **Do not be concerned with the use of t or T . If awrt 16.4 is seen in (a) it must be seen or used in (c) to score.**

M1: Sets " 20 " – " 0.3 " $T^{1.5} = 0$ and proceeds to a value or expression for T e.g. $\left(\frac{"20"}{"0.3"}\right)^{\frac{2}{3}}$

Do not be concerned by the use of any inequalities instead of “=”

You do not need to be concerned by the mechanics of the rearrangement, they just need to achieve a value or expression.

If no equation is seen then may be implied by a correct value for T (to the nearest integer e.g. awrt “16”) or a correct expression for T for their A and B . You may need to check

$\left(\frac{"20"}{"0.3"}\right)^{\frac{2}{3}}$ on your calculator. They may also achieve this by trial and improvement.

A1: $(T =)$ awrt 16.4 including $\left(\frac{200}{3}\right)^{\frac{2}{3}}$ or exact equivalent e.g. $\sqrt[3]{\frac{200}{3}}$ ignore any units for time. If an exact value is given condone the radical symbol not fully covering the fraction

provided it is not clearly e.g. $\frac{\sqrt[3]{200}}{3}$

Condone $(0 \leq) T \leq$ awrt 16.4 o.e. but not $(0 \leq) T <$ awrt 16.4

Do not accept any greater than (or equal) inequalities e.g. $T \geq$ awrt 16.4

isw if there is a written response to (c) once a correct value or valid expression for T is seen.