Question	Scheme	Marks	AOs
4 (a)	Attempts $H = mt + c$ with both $(3, 2.35)$ and $(6, 3.28)$	M1	3.3
	Method to find both *m* and *c*	dM1	3.1a
	$H = 0.31t + 1.42$ oe	A1	1.1b
		(3)	
(b)	Uses the model and states that the initial height is their '*b*'	B1ft	3.4
	Compares 140 cm with their 1.42 (m) and makes a valid comment. In the case where $H = 0.31t + 1.42$ it should be this fact supports the use of the linear model as the values are close.	B1ft	3.5a
		(2)	
			(5 marks)

Notes

Mark parts (a) and (b) as one

(a)

M1: For creating a linear model with both pieces of information given.
Eg. Accept sight of $2.35 = 3m + c$ and $3.28 = 6m + c$ Condone slips on the 2.35 and 3.28.
Allow for an attempt at the "gradient" $m = \frac{3.28 - 2.35}{6 - 3} \left(= 0.31\right)$ or the intercept.
Allow for a pair of simultaneous in any variable even *x* and *y*

dM1: A full method to find both constants. For simultaneous equations award if they arrive at values for *m* and *c*.
If they attempted the gradient it would be for attempting to find "*c*" using $y = mx + c$ with their *m* and one of the points $(3, 2.35)$ or $(6, 3.28)$

A1: A correct model using allowable/correct variables. $H = 0.31t + 1.42$ Condone $h \leftrightarrow H, t \leftrightarrow T$
Allow equivalents such as $H = \frac{31}{100}t + \frac{142}{100}$, $t = \frac{H - 1.42}{0.31}$ but not $H = \frac{0.93}{3}t + 1.42$
Do not allow $H = 0.31t + 1.42$ m (with the units)

(b) To score any marks in (b) the model must be of the form $H = mt + b$ where $m > 0, b > 0$

B1ft: States or implies that 1.42 (with or without units) or 142 cm (including the units) is the original height or the height when $t = 0$
You should allow statements such as *c* = 1.42 or original height = 1.42 (m)
Follow through on their value of '*c*' , so for $H = 0.25t + 1.60$ it is scored for stating the initial height is 1.60 (m) or 160 cm. Do not follow through if $c \leqslant 0$

B1ft: Compares 140 cm with their 1.42 (m) **and** makes a valid comment.
In the case where $H = 0.31t + 1.42$ it should be this fact supports the use of the linear model as the values are close or approximately the same. Allow $1.42\text{m} \approx 1.4\text{m}$ or similar
In the case of $H = 0.25t + 1.60$ it would be for stating that the fact that it does not support the use of the model as the values are too different. If they state $1.60 > 1.40$ this is insufficient. They cannot just state that they are not the same. It must be implied that there is a significant difference.
As a rule of thumb use "good model" for between 135cm and 145 cm.

This requires a correct calculation for their H, a correct statement with an appreciation shown for the units and a correct conclusion.

Notes on Question 4 continue

SC B1 B0 Award SC for incomplete answers which suggest the candidate knows what to do.
Eg. In (b) $H = 0.31t + 1.42$ followed by in (c) It supports the model as when $t = 0$ it is approximately 140 cm