4. A tree was planted in the ground.
Its height, H metres, was measured t years after planting.

Exactly 3 years after planting, the height of the tree was 2.35 metres.
Exactly 6 years after planting, the height of the tree was 3.28 metres.

Using a linear model,

(a) find an equation linking H with t.

(3)

The height of the tree was approximately 140 cm when it was planted.

(b) Explain whether or not this fact supports the use of the linear model in part (a). 2019

(2)

(a) $H = mt + c$. Gradient $m = \frac{\text{Change in } ht}{\text{Change in time}}$

$= \frac{3.28 - 2.35}{6 - 3}$

$= 0.31$.

Substituting ist value

$2.35 = 0.31 \times 3 + c$ gives $c = 1.42$

So required equation is $\underline{H = 0.31t + 1.42}$

(b) At $t = 0$ the model predicts $H = 0.31 \times 0 + 1.42$

$= 1.42\,m = 140cm$.

This is a good fit so the data support the linear model