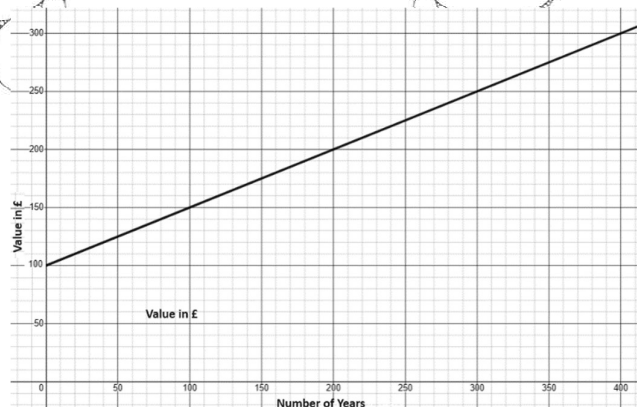


## (29) The Application of Linear Graphs

### WORKING AT D/E

(1) The diagram below shows a very basic model of the value of the painting from when it was first sold.



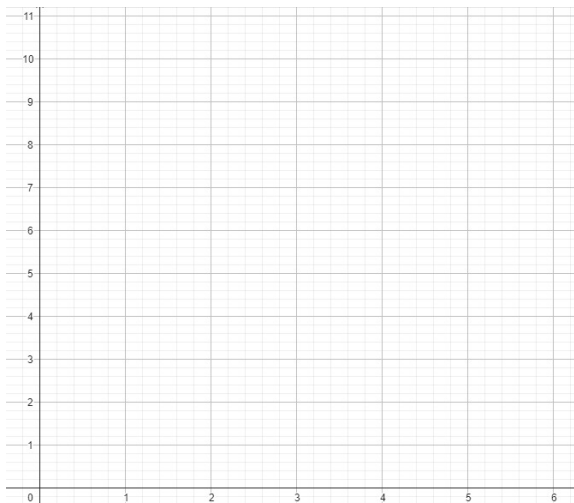
- Interpret the value of 100 on the vertical axis.
- Find the gradient of the line.
- Explain what the gradient represents in context of the model.
- Hence write an equation for the model in the form  $V = aN + b$  where  $V$  is the value of the painting in £ and  $N$  is the number of years after the painting was first sold.

### WORKING AT B/C

(1) The table below shows the length ( $L$ ) of a genetically modified leaf in cm over a number of weeks ( $W$ ).

$W$	0	1	2	3	4	5	6
$L$	0	1.8	3.6	5.4	7.2	9	10.8

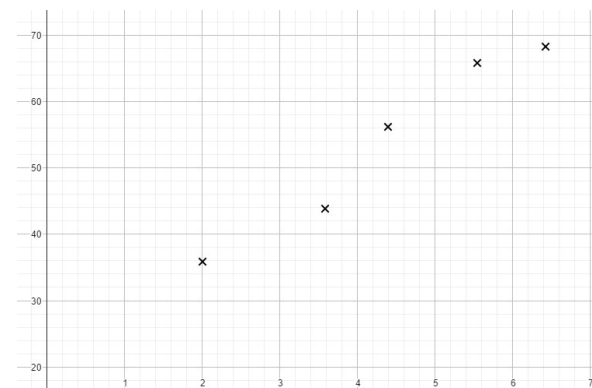
(a) Plot the points on a graph like that below and connect them.



- Is the data suitable for a linear model?
- Explain why the model is an example of direct proportion.
- Write an equation for the length of the leaf in the form  $L = aW + b$
- Interpret, in context, the constant  $a$  and explain, in context, why  $b = 0$ .
- Explain the long-term possible limitations of the model.
- Find how many weeks it will take for the leaf to have a length of 37cm

### WORKING AT A\*/A

(1) The diagram below shows a scatter graph. The data shows the number of months 5 students have had maths tutoring and the % they get in a test at the end of their tutoring.



- Draw a line of best fit on a graph similar to the one shown above.
- Find an equation for this line in the form  $P = aM + b$  where  $P$  is their test % and  $M$  is the number of months they have been tutored for.
- Interpret, in context the constants  $a$  and  $b$
- A student had had 2 months of tutoring. Use the model to predict the % they would get in their test.
- Explain 2 limitations of the model.
- Explain why the model doesn't show direct proportion.  
30 more students enrolled in the tutoring. A model was found for all 30 students. The new model was  $P = 12M + (b - 5)$
- What assumptions can you make about the new students who joined in comparison to the original 5 students