

6 Victoria, a market researcher, believes the average weekly value, £ V million, of online grocery sales in the UK has grown exponentially since 2009.

Victoria models the incomplete data, shown in the table, using the formula

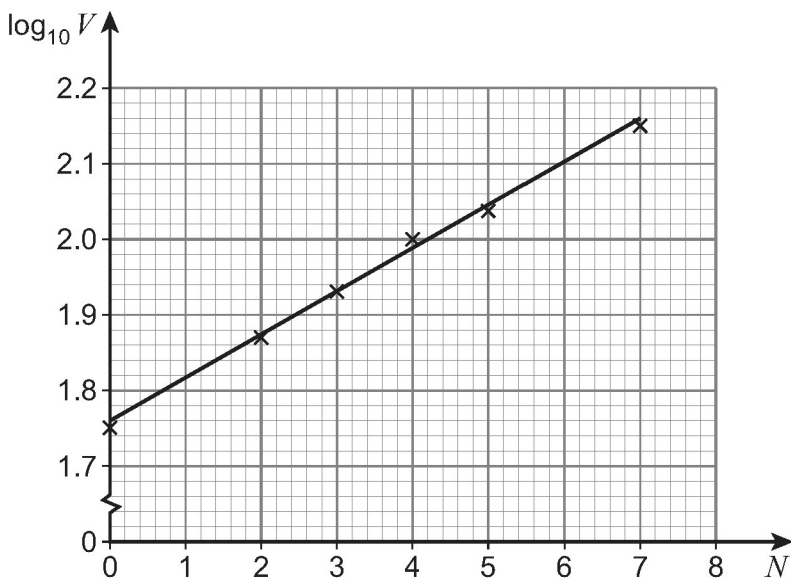
$$V = a \times b^N$$

where N is the number of years since 2009 and a and b are constants.

Year	2009	2010	2011	2012	2013	2014	2015	2016
Average Weekly Sales £ V million	56.4		74.5	86.9	97.7	109.3		141.9

6 (a) Victoria wishes to determine the values of a and b in her formula.

To do this she plots a graph of $\log_{10} V$ against N and then draws a line of best fit as shown in the diagram below.



The equation of Victoria's line of best fit is

$$\log_{10} V = 0.057 N + 1.76$$

6 (a) (i) Use the equation of Victoria's line of best fit to show that, correct to three significant figures, $a = 57.5$

[1 mark]

6 (a) (ii) Use the equation of Victoria's line of best fit to find the value of b

Give your answer to three significant figures.

[1 mark]

6 (b) According to Victoria's model, state the yearly percentage increase in the average weekly value of online grocery sales.

[1 mark]

6 (c) (i) Use Victoria's model to predict the average weekly value of online grocery sales in 2025.

[2 marks]

6 (c) (ii) Explain why the prediction made in part (c)(i) may be unreliable.

[1 mark]