1.   Nov/2023/Paper_0606/11/No.4

x	1	2	3	4	5
y	20	57	104	160	224

The table shows values of the variables x and y, which are related by the equation $y = Ax^b$, where A and b are constants.
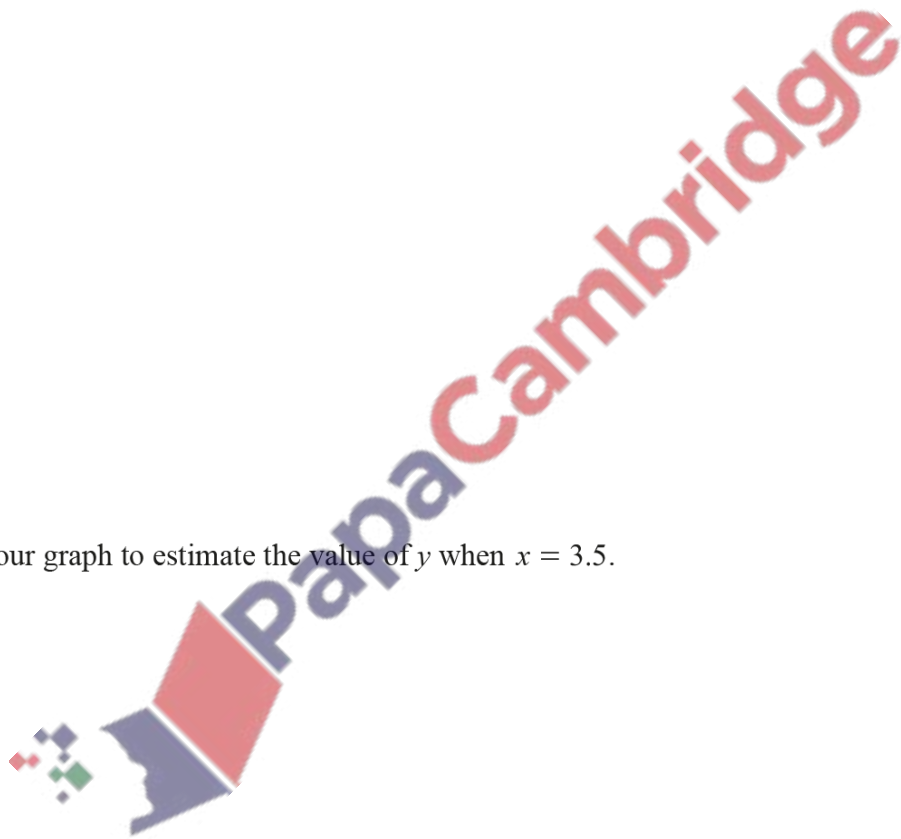
(a)   Use the data to draw a straight line graph of $\ln y$ against $\ln x$. [3]
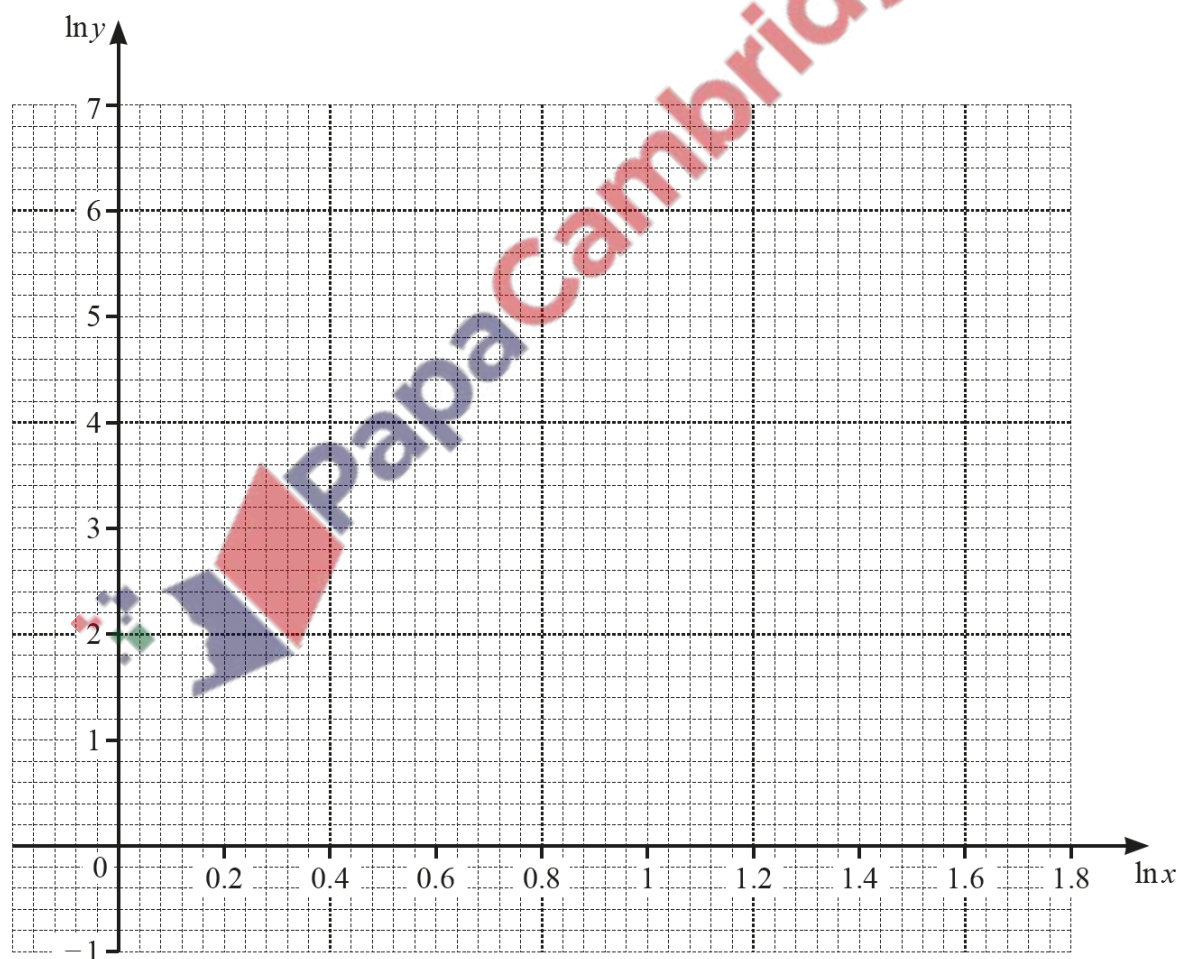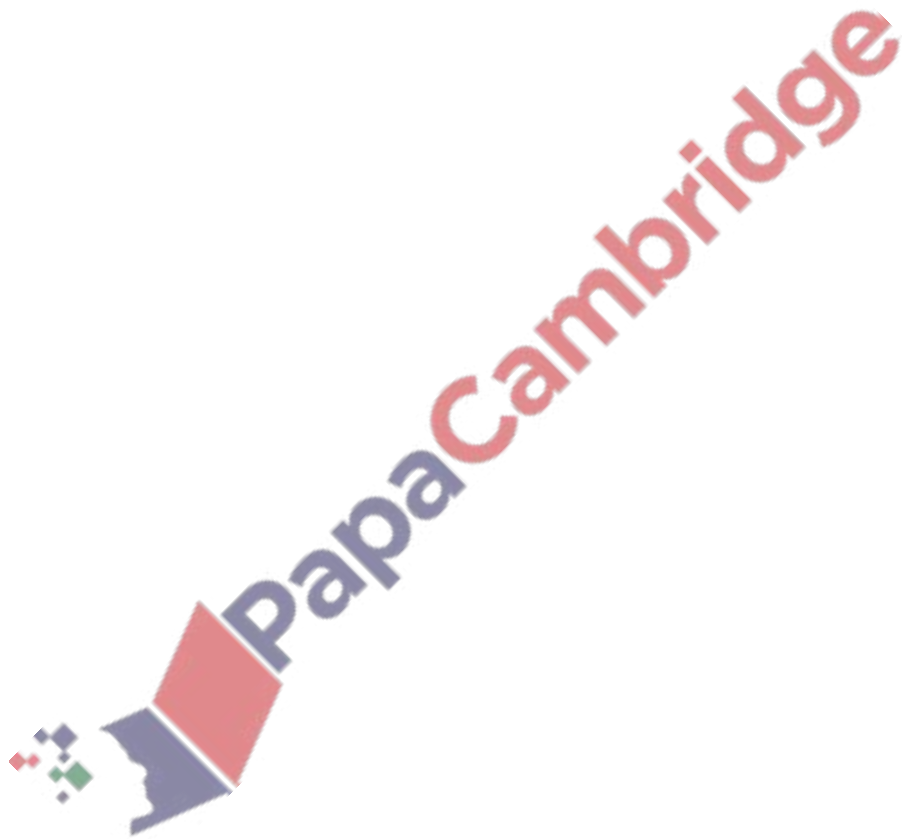
(b) Use your graph to estimate the values of A and b. Give your answers correct to 2 significant figures. [4]

(c) Use your graph to estimate the value of y when $x = 3.5$. [2]
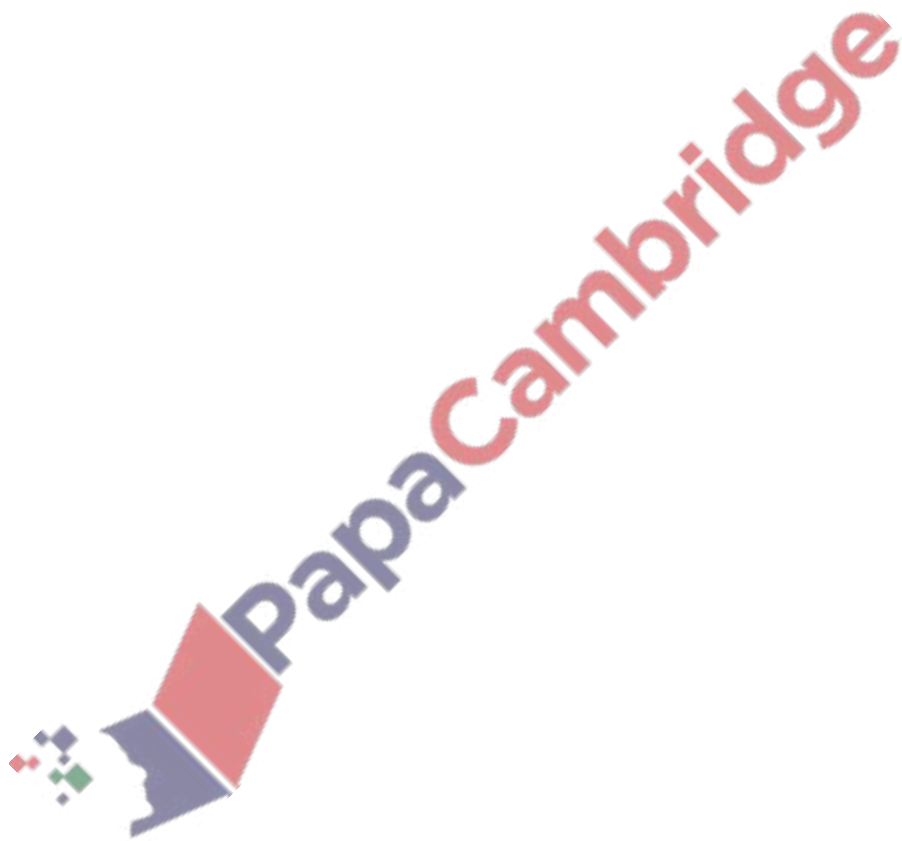
2. Nov/2023/Paper_0606/12/No.3

When $\ln(y+2)$ is plotted against x^2 a straight line graph is obtained. The line passes through the points $(2.25, 9.37)$ and $(4.75, 3.92)$. Find y in terms of x. [5]

3.

The perpendicular bisector of the line joining the points $\left(-3, \frac{2}{3}\right)$ and $\left(6, -\frac{7}{3}\right)$ passes through the point $(2, k)$. Find the value of k. [4]
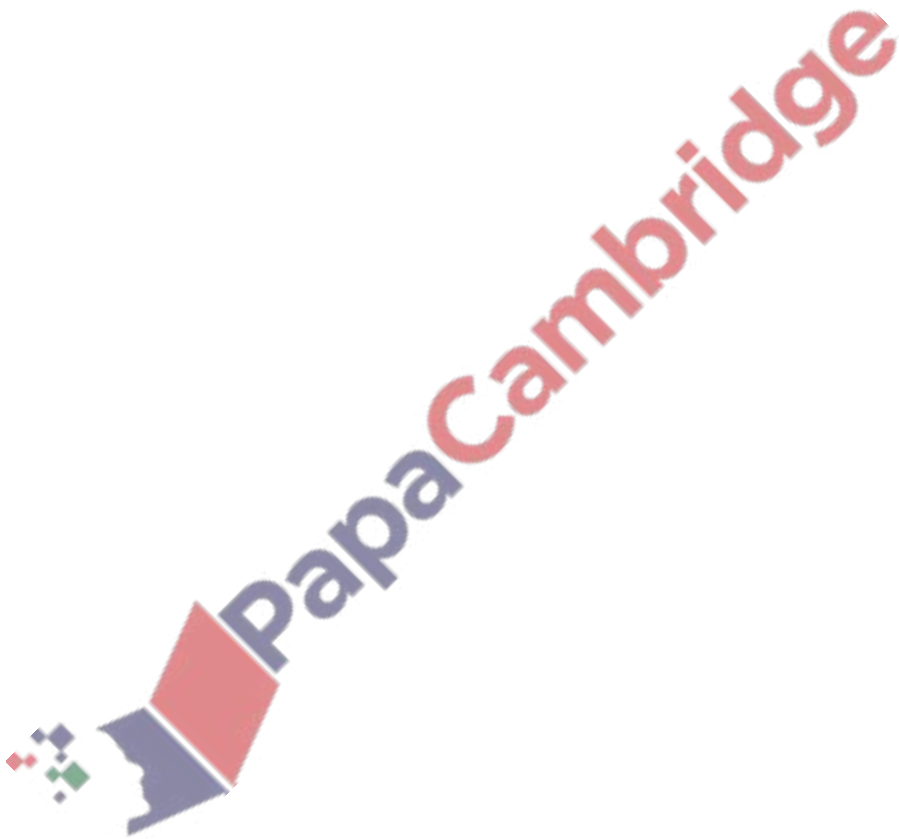
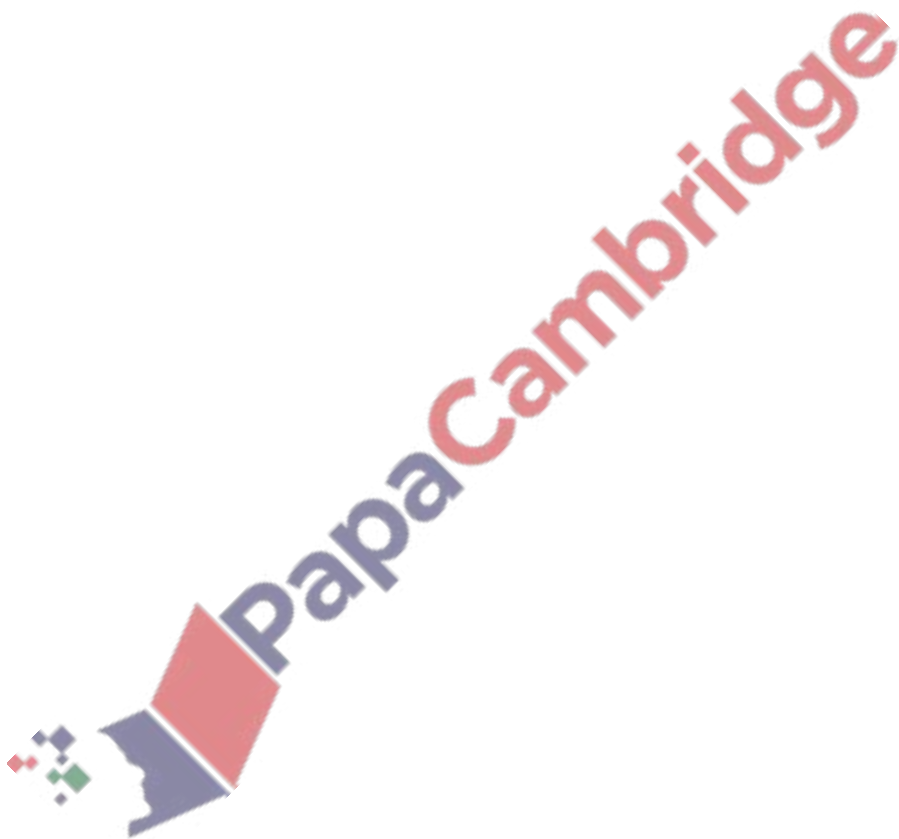In this question p and q are constants.

The normal to the curve $y = \dfrac{p}{x^2} + 5x - 2$, at the point where $x = 1$, has equation $y = -x + q$.

Find the values of p and q. [6]

(a) A straight line passes through the points (4, 23) and (−8, 29). Find the point of intersection, P, of this line with the line $y = 2x + 5$. [5]
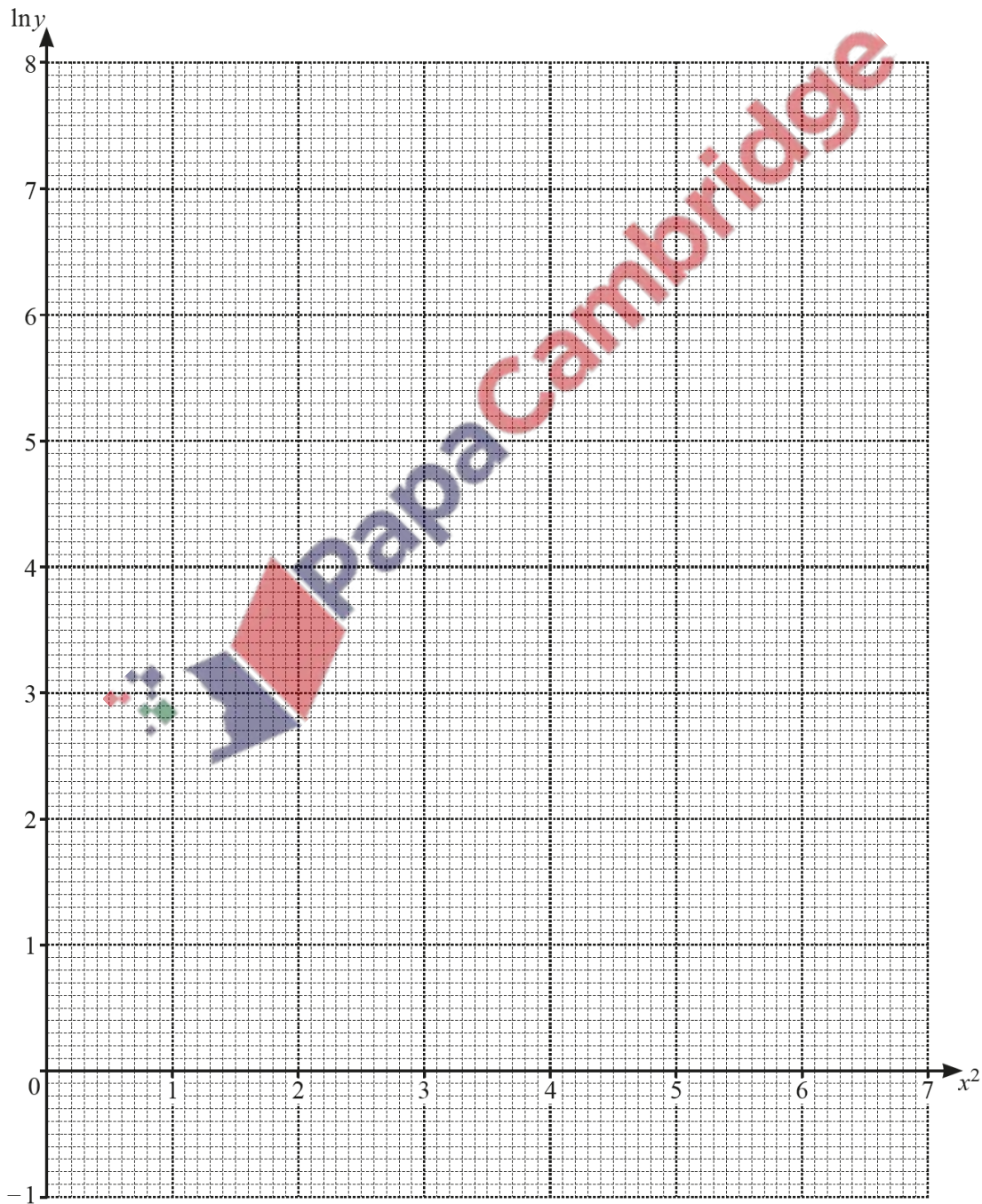
(b) Find the distance of P from the origin. [2]

The table shows values of the variables x and y, which are related by an equation of the form $y = Ab^{x^2}$, where A and b are constants.

x	1	1.5	2	2.5
y	2.0	11.3	128	2896

(a) Use the data to draw a straight line graph of $\ln y$ against x^2. [2]
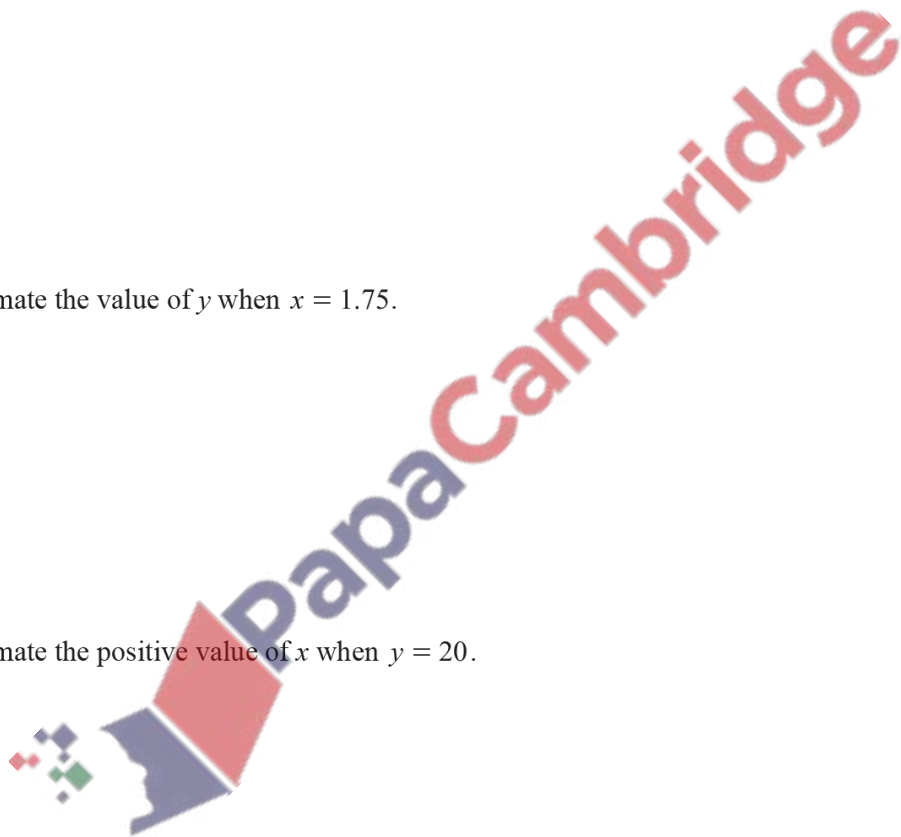
(b) Use your graph to estimate the values of A and b. Give your answers correct to 1 significant figure.

[5]

(c) Estimate the value of y when $x = 1.75$. [2]

(d) Estimate the positive value of x when $y = 20$. [2]

The points A and B have coordinates $(2, 5)$ and $(10, -15)$ respectively. The point P lies on the perpendicular bisector of the line AB. The y-coordinate of P is -9.

(a) Find the x-coordinate of P. [5]

(b) The point R is the reflection of P in the line AB. Find the coordinates of R. [2]
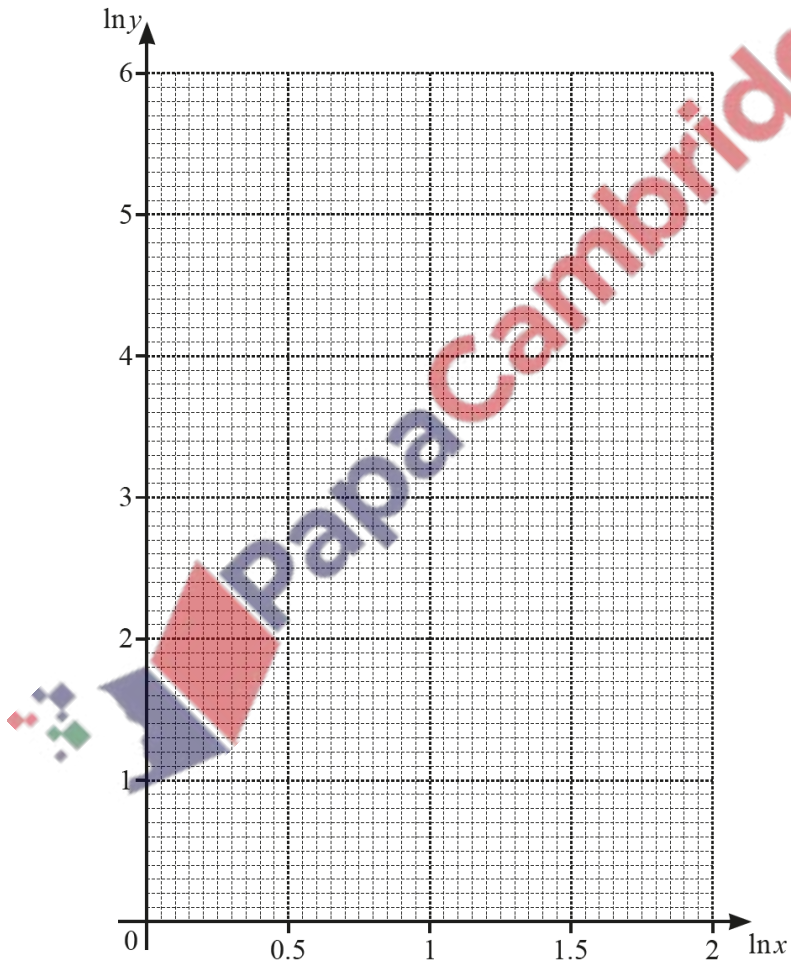
The table shows values of the variables x and y which are related by an equation of the form $y = Ax^b$, where A and b are constants.

x	1.5	2	2.5	3	4
y	13.8	27.5	46.9	72.6	145

(a) Use the data to draw a straight line graph of $\ln y$ against $\ln x$. [3]

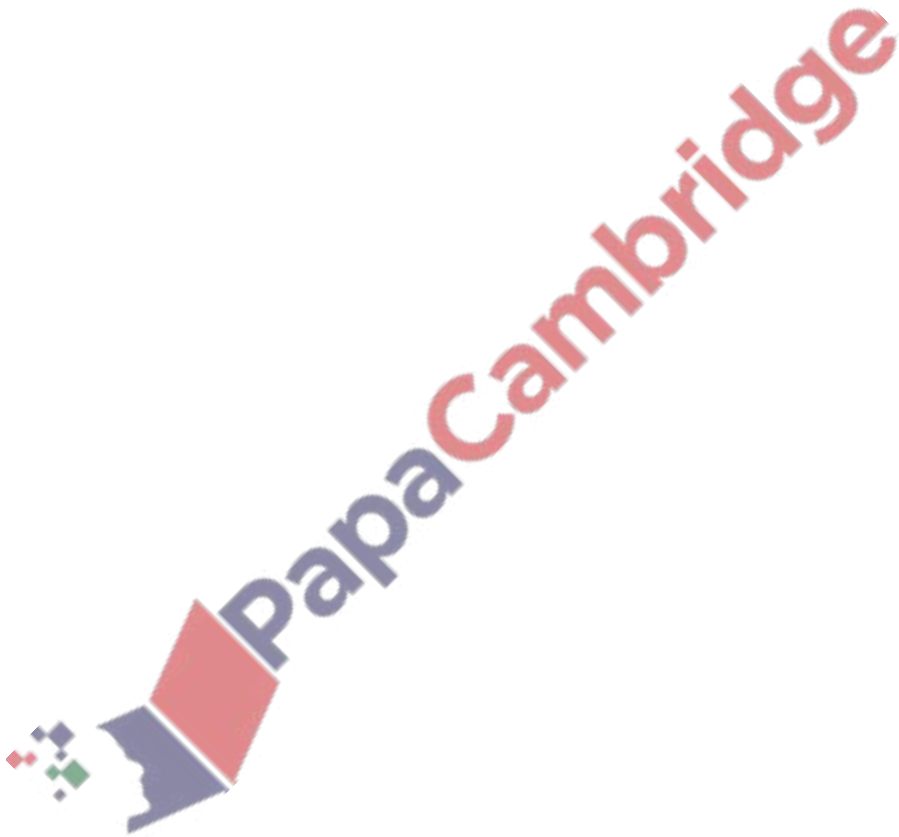**(b)** Use your graph to estimate the values of A and b. [5]

(c) Estimate the value of x when $y = 100$. [2]
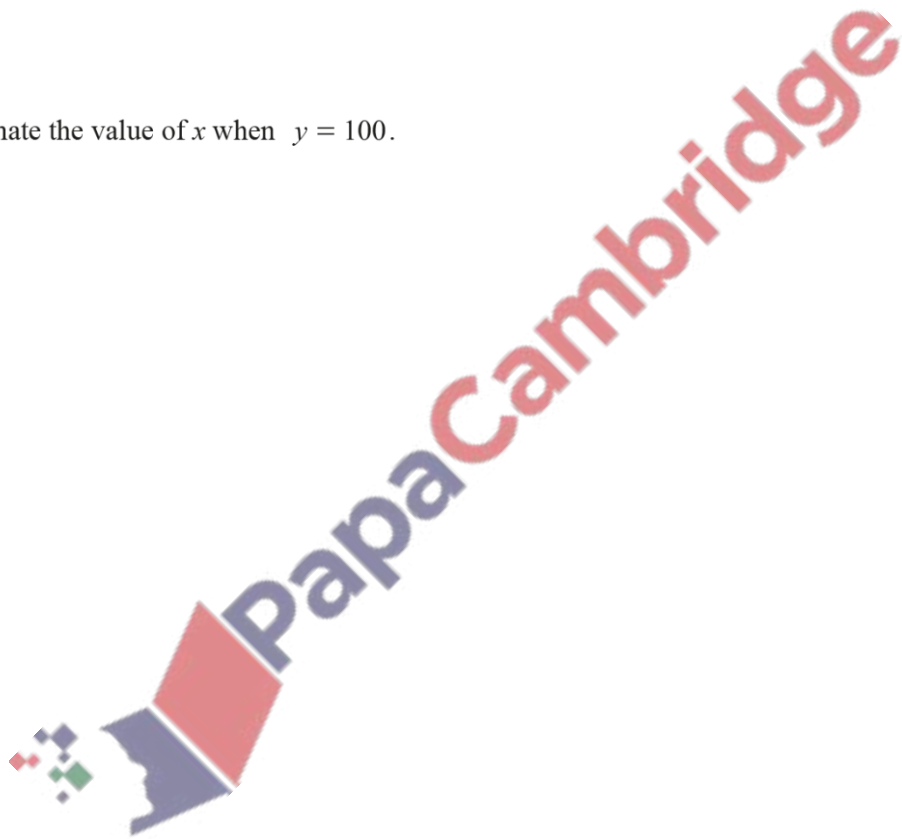
Variables x and y are such that when $\lg y$ is plotted against $\sqrt{x}$ a straight line passing through the points $(1, 5)$ and $(2.5, 8)$ is obtained. Show that $y = A \times b^{\sqrt{x}}$ where A and b are constants to be found. [4]

Variables P and T are known to be connected by the relationship $P = Ab^T$, where A and b are constants. Values of P are found for certain values of time, T.

(a) Show that a graph of $\lg P$ against T will be a straight line. [2]

(b) $\lg P$
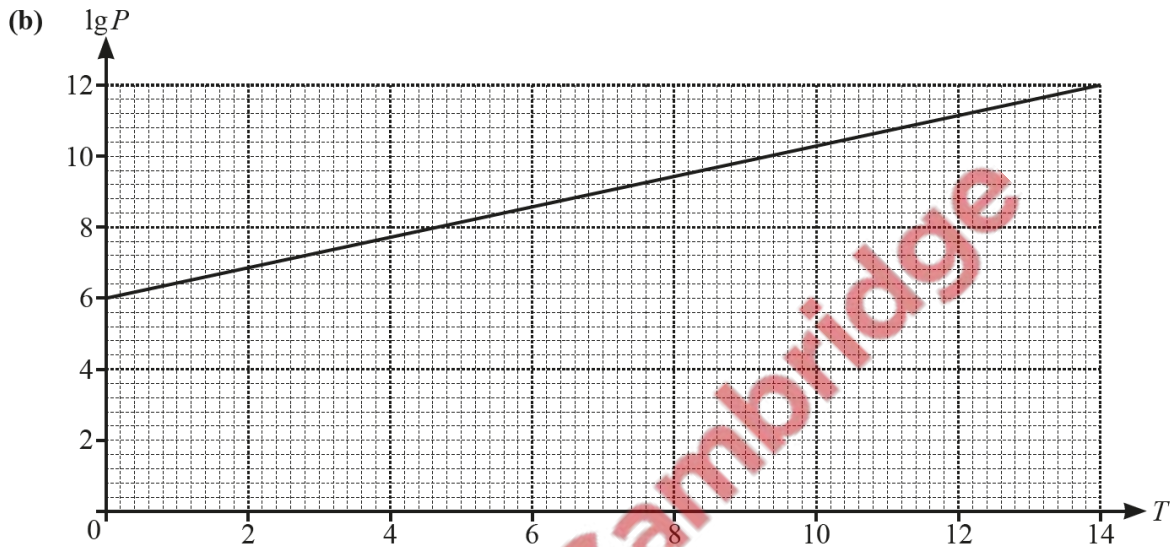
The diagram shows the graph of $\lg P$ against T. The graph passes through $(0, 6)$ and $(14, 12)$. Find the values of A and b. [4]

(c) Using the graph or otherwise, find the length of time for which P is between 100 million and 1000 million. [3]

13