



Linear Law – Practice 3

1. The following table shows the corresponding values of two variables, x and y , that are related by the equation $y = pk^{\sqrt{x}}$, where p and k are constants.

x	1	4	9	16	25	36
y	1.80	2.70	4.05	6.08	9.11	13.67

- (a) Plot $\log_{10} y$ against \sqrt{x} . Hence, draw the line of best fit
(b) Use your graph in (a) to find the values of p and k .

[Ans : $p=1.23, k=1.5$]

2. The table below shows the corresponding values of two variables, x and y , that are related by the equation $y = 5hx^2 + \frac{k}{h}x$, where h and k are constants.

x	2	3	4	5	6	7
y	7.0	11.3	16.0	21.2	27.0	33.2

- (a) Using a scale of 2 cm to 1 unit on the x -axis and 2 cm to 0.2 units on the $\frac{y}{x}$ -axis, plot the graph of $\frac{y}{x}$ against x . Hence, draw the line of best fit.
(b) Use your graph in (a) to find the values of
(i) h ,
(ii) k ,
(iii) y when $x = 6$.

[$h \approx 0.05, k \approx 0.15; y \approx 26.88$]



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3. The table 7 below shows the values of two variables, x and y , obtained from an experiment. The variables x and y are related by the equation $\frac{a}{y} = \frac{b}{x} + 1$, where k and p are constants.

x	1.5	2.0	3.0	4.0	5.0	6.0
y	5.004	1.540	0.930	0.770	0.702	0.656

Table 7

- (a) Based on the table above, construct a table for the values of $\frac{1}{x}$ and $\frac{1}{y}$. Plot $\frac{1}{y}$ against $\frac{1}{x}$,

using a scale of 2 cm to 0.1 unit on the $\frac{1}{x}$ -axis and 2 cm to 0.2 unit on the $\frac{1}{y}$ -axis. Hence,

draw the line of best fit.

- (b) Use the graph from (a) to find the value of
- a ,
 - b .

[$a=0.505, b=-1.356$]

4. The table below shows the corresponding values of two variables, x and y , that are related by the equation $y = qx + \frac{p}{qx}$, where p and q are constants.

x	2.5	3.0	3.5	4.0	4.5	5.0
y	1.0	2.7	4.1	6.5	6.8	8.0

One of the values of y is incorrectly recorded.

- (a) Using scale of 2 cm to 5 units on the both axis, plot the graph of xy against x^2 . Hence, draw the line of best fit
- (b) Use your graph in (a) to answer the following questions:
- State the values of y which is incorrectly recorded and determine its actual value.
 - Find the value of p and of q .

[$y_{\text{incorrect}} = 6.5, y_{\text{actual}} \approx 5.75; p \approx -16.5, q = 1.94$]

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Answering Exam Questions

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