Chapter 7 Straight-line Graph

Part 2

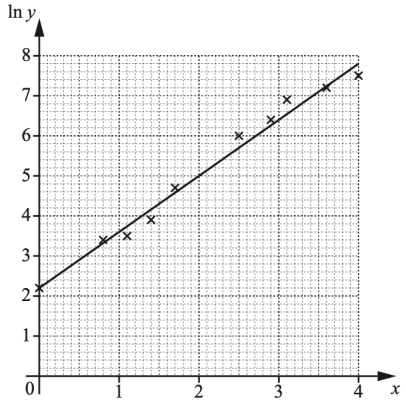
0606/22/F/M/19

1. The relationship between experimental values of two variables, *x* and *y*, is given by $y = Ab^x$, where *A* and *b* are constants.

   a. Transform the relationship $y = Ab^x$ into straight line form.

[2]

The diagram shows ln *y* plotted against *x* for ten different pairs of values of *x* and *y*. The line of best fit has been drawn.



   b. Find the equation of the line of best fit and the value, correct to 1 significant figure, of *A* and of *b*.

[4]

   c. Find the value, correct to 1 significant figure, of *y* when *x* = 2.7.

[2]

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2. When lg *y* is plotted against x^2 a straight line graph is obtained which passes through the points (2, 4) and (6, 16).

   a. Show that $y = 10^{A+Bx^2}$, where *A* and *B* are constants.

[4]

   b. Find *y* when $x = \frac{1}{\sqrt{3}}$.

[2]

   c. Find the positive value of *x* when *y* = 2.

[3]

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3. When e^y is plotted against $\frac{1}{x}$, a straight line graph passing through the points (2, 20) and (4, 8) is obtained.
    a. Find *y* in terms of *x*.

[5]

b. Hence find the positive values of *x* for which *y* is defined.

[1]

c. Find the exact value of *y* when *x* = 3.

[1]

d. Find the exact value of *x* when *y* = 2.

[2]

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4. When lg *y* is plotted against *x*, a straight line graph passing through the points (2.2,3.6) and (3.4,6) is obtained.

    a. Given that $y = Ab^x$, find the value of each of the constants *A* and *b*.

[5]

    b. Find *x* when *y* = 900.

[2]

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5. When $log\ y^2$ is plotted against *x*, a straight line is obtained passing through the points (5, 12) and (3, 20). Find *y* in terms of *x*, giving your answer in the form $y = 10^{ax+b}$ where *a* and *b* are integers.

[5]

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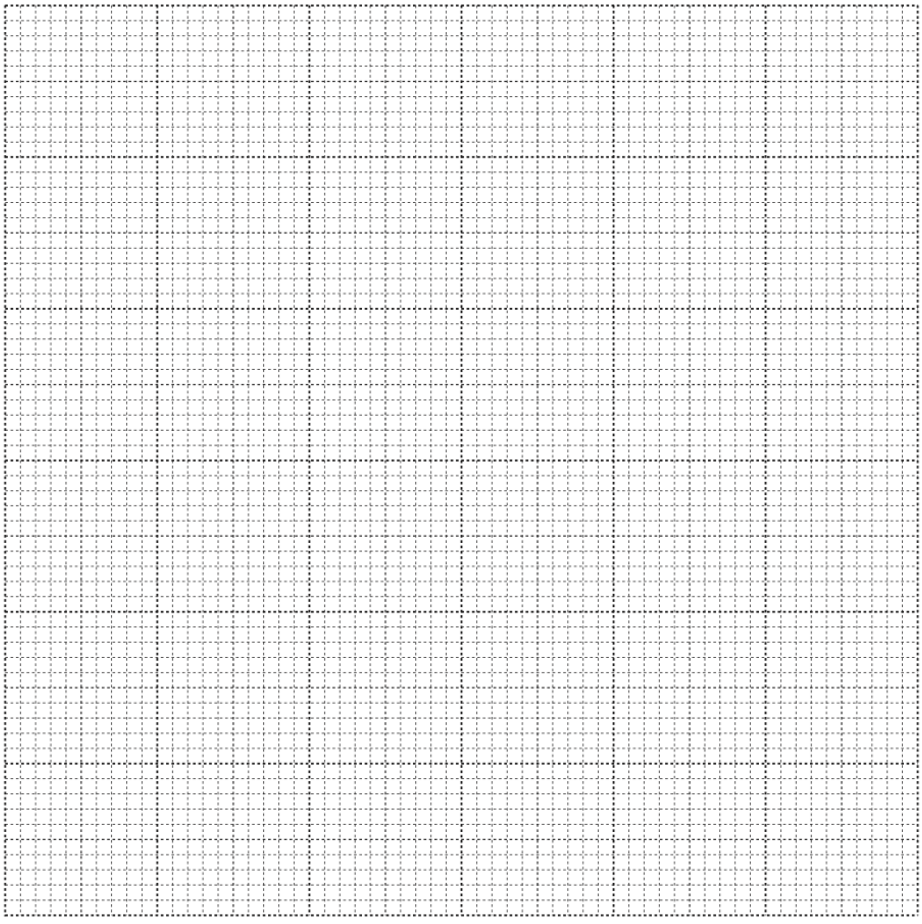
6.

x	1	1.5	2	2.5	3
y	6	14.3	48	228	1536

The table shows values of the variables *x* and *y* such that $y = Ab^{x^2}$, where *A* and *b* are constants.

(i) Draw a straight line graph to show that $y = Ab^{x^2}$.

[4]



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(ii) Use your graph to find the value of A and of b.

[4]

(iii) Estimate the value of x when $y = 100$.

[2]