LINEAR LAW
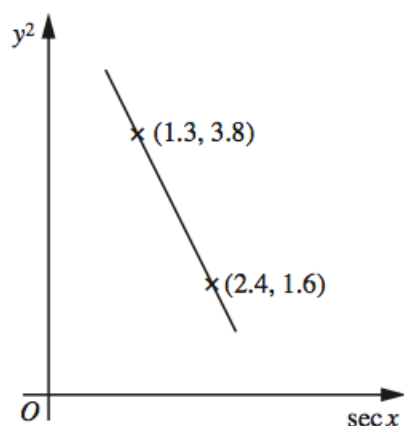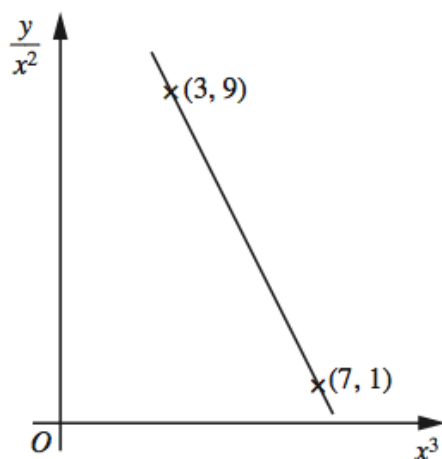
1)

Variables x and y are such that, when y^2 is plotted against $\sec x$, a straight line graph passing through the points $(2.4, 1.6)$ and $(1.3, 3.8)$ is obtained.

(i) Express y^2 in terms of $\sec x$.   [3]
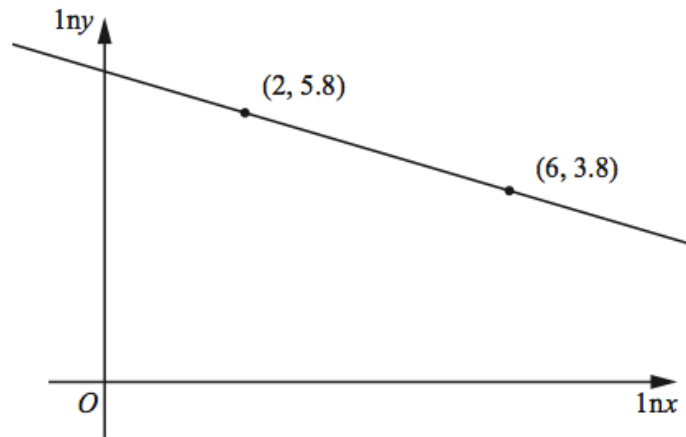
(ii) Hence find the exact value of $\cos x$ when $y = 2$.   [2]

2)

The variables x and y are related so that, when $\dfrac{y}{x^2}$ is plotted against x^3, a straight line graph passing through $(3, 9)$ and $(7, 1)$ is obtained. Express y in terms of x.   [4]
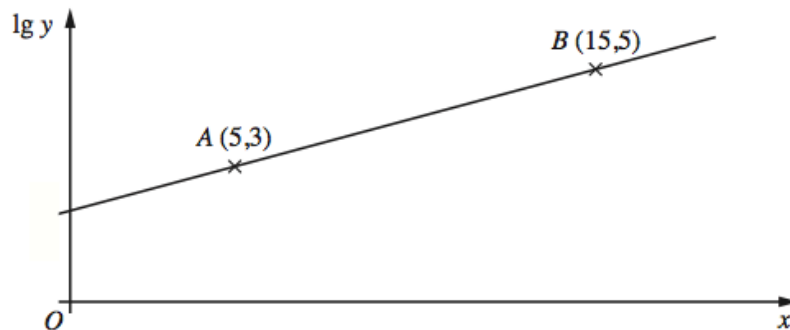
3)

Variables x and y are such that, when $\ln y$ is plotted against $\ln x$, a straight line graph passing through the points $(2, 5.8)$ and $(6, 3.8)$ is obtained.

(i) Find the value of $\ln y$ when $\ln x = 0$.   [2]

(ii) Given that $y = Ax^b$, find the value of A and of b.   [5]

4)

The figure shows the graph of a straight line with $\lg y$ plotted against x. The straight line passes through the points $A(5,3)$ and $B(15,5)$.
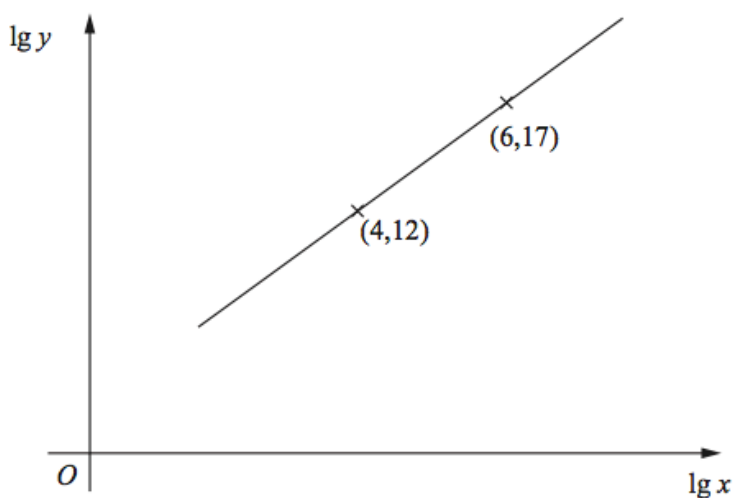

(i) Express $\lg y$ in terms of x.   [3]

(ii) Show that $y = a(10^{bx})$ where a and b are to be found.   [3]

5)

7 The variables x and y are related so that when $\lg y$ is plotted against $\lg x$ a straight line graph passing through the points $(4, 12)$ and $(6, 17)$ is obtained.
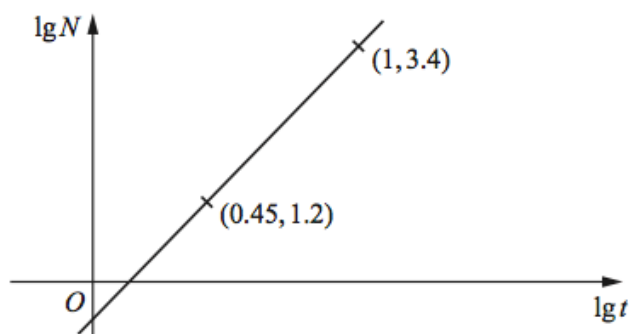

(i) Express y in terms of x, giving your answer in the form $y = ax^b$. [6]

(ii) Find the value of x when $y = 300$. [2]

6)

Variables t and N are such that when $\lg N$ is plotted against $\lg t$, a straight line graph passing through the points $(0.45, 1.2)$ and $(1, 3.4)$ is obtained.
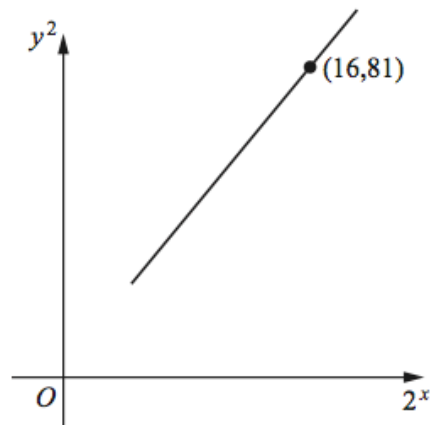

(i) Express the equation of the straight line graph in the form $\lg N = m \lg t + \lg c$, where m and c are constants to be found. [4]

(ii) Hence express N in terms of t. [1]

7)

Variables x and y are such that, when y^2 is plotted against 2^x, a straight line graph is obtained. This line has a gradient of 5 and passes through the point (16,81).
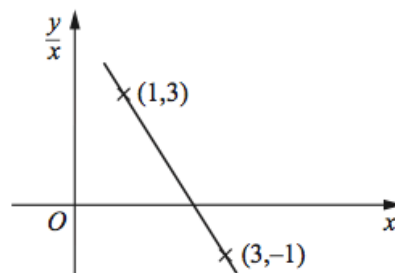

(i) Express y^2 in terms of 2^x. [3]

(ii) Find the value of x when $y = 6$. [3]

8)

The variables x and y are related in such a way that when $\dfrac{y}{x}$ is plotted against x a straight line is obtained, as shown in the graph. The line passes through the points $(1, 3)$ and $(3, -1)$.

(i) Express y in terms of x. [4]

(ii) Find the value of x and of y such that $\dfrac{y}{x} = -9$. [2]