Experimental data

1. The variables x and y are connected by a relationship of the form $y = kx^n$.

   (a) Show that there is a linear relationship between $\log_{10} y$ and $\log_{10} x$.
   (b) From an experiment some data was obtained. The table shows this data.

x	50.1	194.9	501.2	707.9
y	20.9	46.8	83.2	102.3

   Use the table to find the values of k and n.

2. The variables x and y are connected by a relationship of the form $y = ax^b$.

   (c) Show that there is a linear relationship between $\log_{10} y$ and $\log_{10} x$.
   (d) From an experiment some data was obtained. The table shows this data.

x	1.2	3.1	5.5	6.5
y	3.94	16.37	38.7	49.7

   Use the table to find the values of a and b.

3. The variables x and y are connected by a relationship of the form $y = kx^n$.

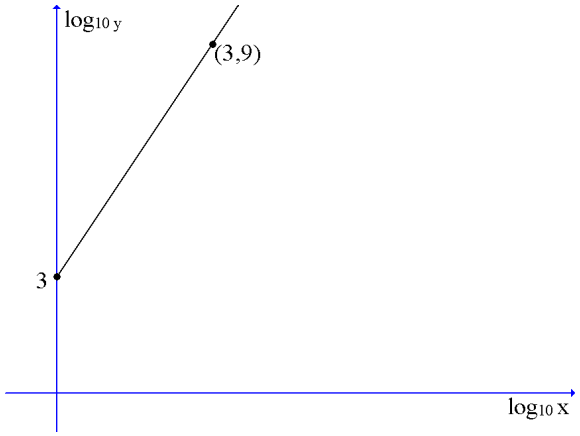
   (e) Show that there is a linear relationship between $\log_{10} y$ and $\log_{10} x$.
   (f) From an experiment some data was obtained. The table shows this data.

x	14.1	28.2	63.1	126
y	15.9	6.31	3.16	1.58

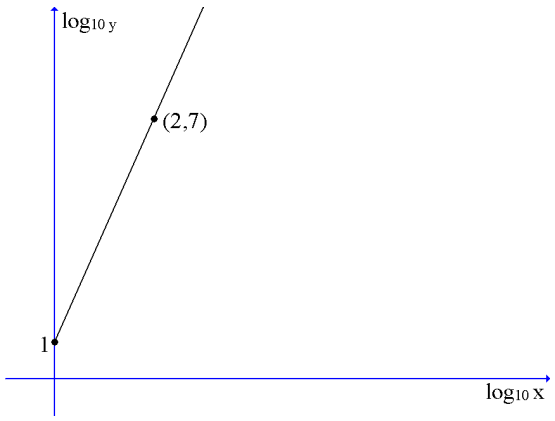
   Use the table to find the values of k and n.

4. Each of the following graphs is of the form $y = kx^n$. Find k and n.

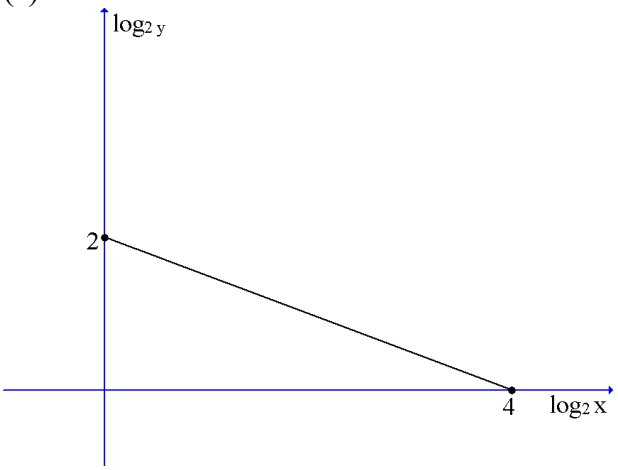
(a)



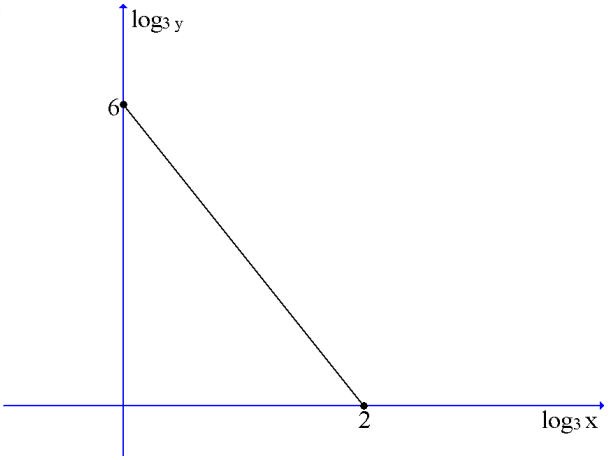
(b)



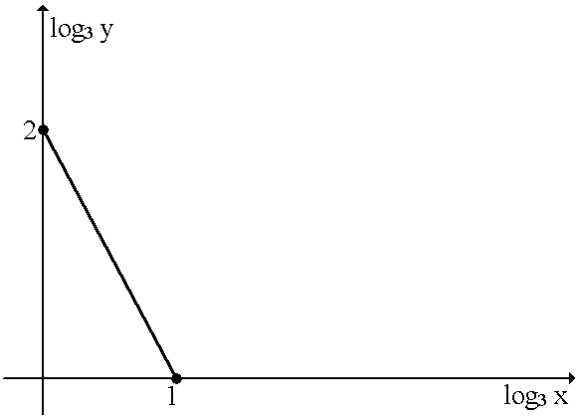
(c)



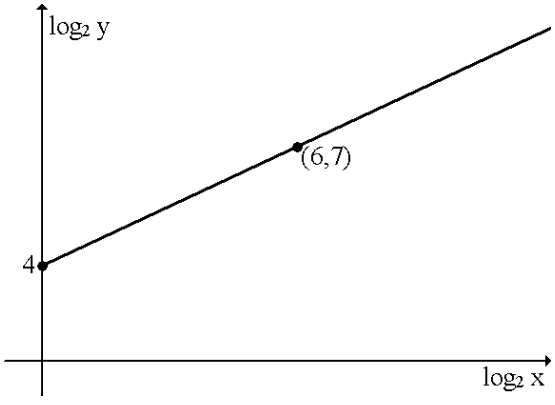
(d)



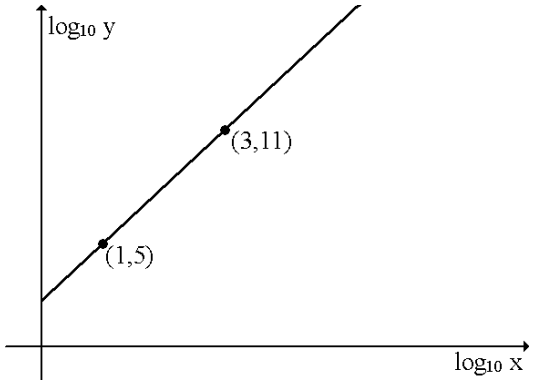
(e)



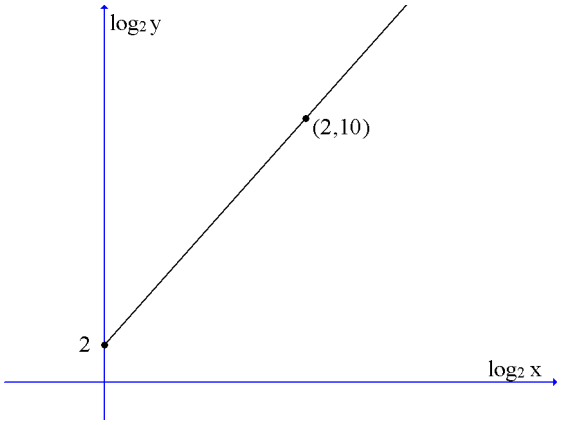
(f)



(g)



(h)



5. The variables x and y are connected by the relationship $y = ae^{bx}$.

(a) Show that there is a linear relationship between $\log_e y$ and x.
(b) From an experiment some data was obtained. The table shows this data.

x	3.1	3.5	4.1	5.2
y	21876	72631	439392	11913076

Use the table to find the values of a and b.

6. The variables x and y are connected by the relationship $y = kn^x$.

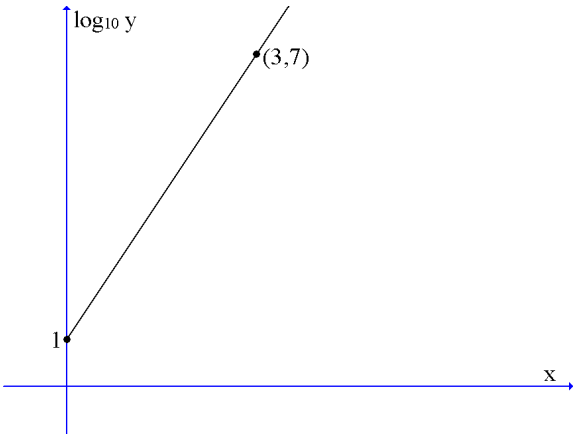
(c) Show that there is a linear relationship between $\log_{10} y$ and x.
(d) From an experiment some data was obtained. The table shows this data.

x	1.0	1.5	2.5	3.0
y	6.0	8.5	16.9	24.0

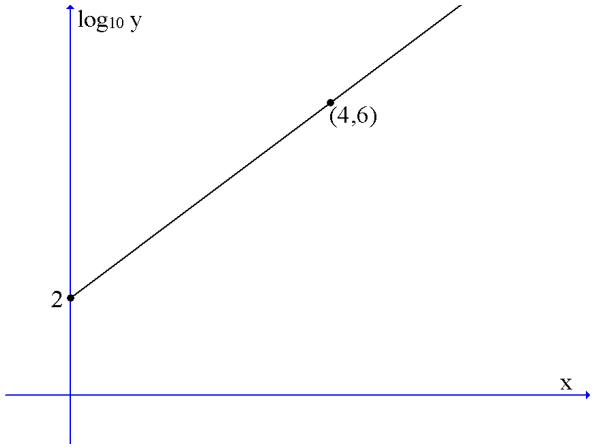
Use the table to find the values of k and n.

7. Each of the following is of the form $y = ab^x$. Find a and b.

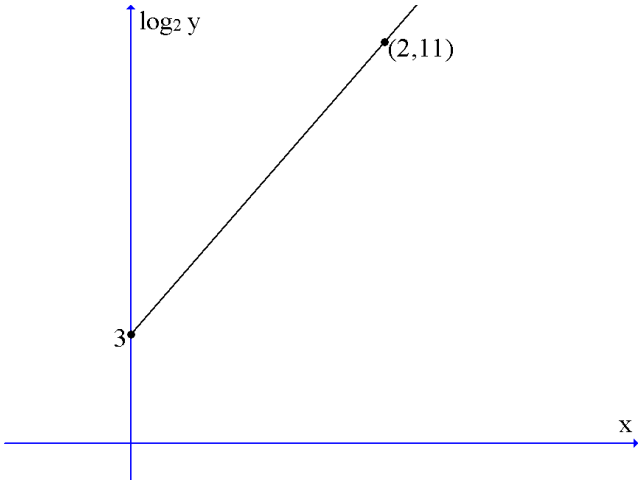
(a)



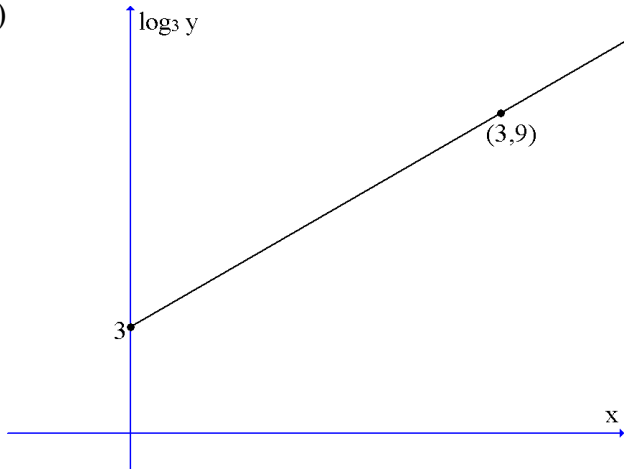
(b)



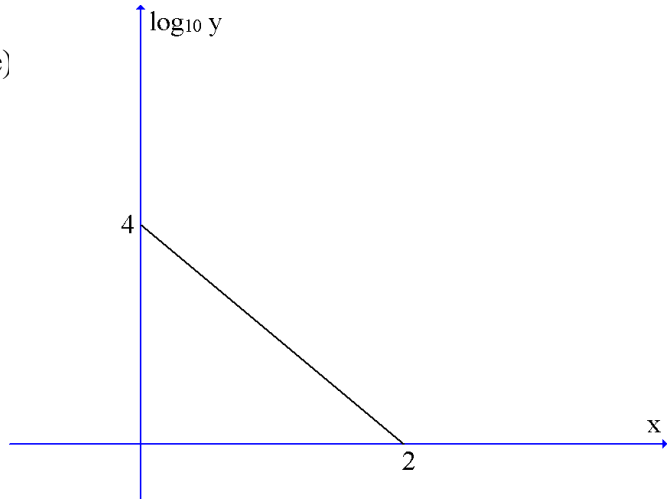
(c)



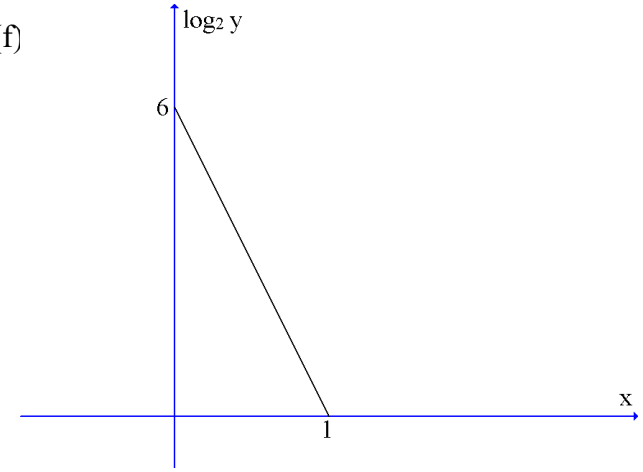
(d)



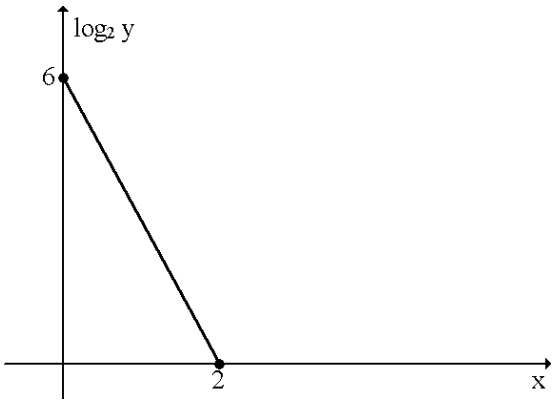
(e)



(f)



(g)



(h)