

Inverse Proportion (Algebraic)

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(1) y is inversely proportional to x .

Complete the table below.

x	1	2	5		
y			2	20	100

(2) y is inversely proportional to x^2 .

Complete the table below.

x	2	3	4		
y	36			576	1152

(3) $y \propto \frac{1}{\sqrt{x}}$. Complete the table below.

x	4	25	64		
y	50			0.25	0.01

(4) y is inversely proportional to x .

When $y = 2$, $x = 25$.

- Write an equation connecting x and y .
- Use your answer to part (a) to find the value of y when $x = 10$.
- Use your answer to part (a) to find the value of x when $y = 0.25$.

(5) y varies inversely with x^2 .

When $y = 1$, $x = 8$.

- Write an equation connecting x and y .
- Use your answer to part (a) to find the value of y when $x = 4$.
- Use your answer to part (a) to find the value of x when $y = 2$.

(6) T is inversely proportional to the cube of S .

When $T = 0.8$, $S = 5$

- Write an equation connecting T and S .
- Use your answer to part (a) to find the value of T when $Q = 2$.
- Use your answer to part (a) to find the value of Q when $y = 6$ correct to 3 SF.

(7) Show that the equation $xy = 6$ represents inverse proportion stating the constant of proportionality.

(8) The volume of an ice cube (V) ml is inversely proportional to the amount of time (T) minutes since it was removed from a freezer. An ice cube that has been out of the freezer for 4 minutes has volume 300ml.

(a) Show that $V = \frac{1200}{T}$

- Find the volume of the ice cube after 1 hour.
- Find how long it takes for the ice cube to have a volume of 20ml.

(9) H is inversely proportional to the cube root of L . When $H = 4$, $L = 216$.

- Find H when $L = 100$ to 3 SF.
- Find L when $H = 0.124$ to 3 SF.

(10) $R \propto \frac{1}{\sqrt{T}}$. When $T = 16$, $R = 10$. Find the greatest value of T such that $R < 1.5$

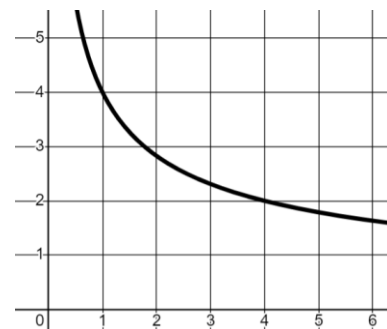
(11) The number of rats in a rat colony is inversely proportional to the time after the rat colony was first studied.

- Is the population increasing or decreasing? You must give a reason for answer.
- Sketch a graph showing the number of rats in the rat colony over time.

(12) R varies inversely with $T^{\frac{1}{4}}$. When $T = 256$, $R = 8$. Find a simplified expression for R when $T = 8x^{12}$.

Give your answer in the form $T = 2^m x^n$ where m and n are in their simplest form.

(13) y is inversely proportional to the root of x . The graph below shows the relationship between x and y .



Without a calculator, find the value of x when $y = 6\sqrt{2}$