



Direct and Inverse Proportions

Key Notes

1.1 Direct Proportion

When two quantities are in direct proportion to each other, they increase or decrease proportionally. So, when x increases by a certain factor, y increases proportionally. And when x decreases by a certain factor, y also decreases proportionally.

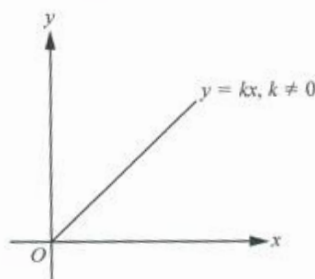
Note:

In direct proportion, the two quantities move in similar directions. When $x \uparrow$, $y \uparrow$. When $x \downarrow$, $y \downarrow$.

If y is directly proportional to x , then $\frac{x_2}{x_1} = \frac{y_2}{y_1}$.

Also, $\frac{y}{x} = k$ or $y = kx$, where k is a constant and $k \neq 0$.

When x and y are directly proportional to each other, the equation representing their relationship is $y = kx$, where k is a constant and $k \neq 0$. Therefore, the graph of y against x is a straight line that passes through the origin O .



1.2 Inverse Proportion

When two quantities are in inverse proportion to each other, as one quantity increases, the other quantity decreases. Inverse proportion is also known as indirect proportion.

Note:

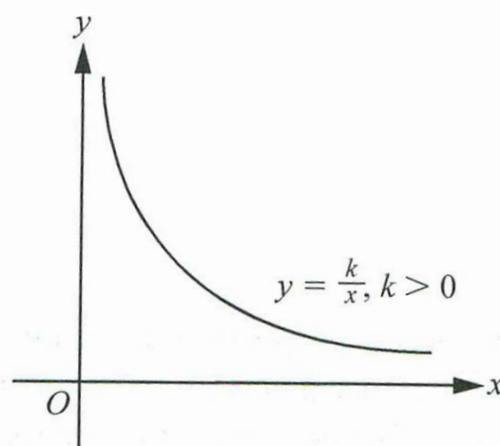
In inverse proportion, the two quantities move in opposite directions. When $x \uparrow$, $y \downarrow$. When $x \downarrow$, $y \uparrow$.

If y is inversely proportional to x , then $\frac{y_2}{y_1} = \frac{x_1}{x_2}$, or $x_1y_1 = x_2y_2$.

Also, $xy = k$ or $y = \frac{k}{x}$, where k is a constant and $k \neq 0$.

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- When x and y are inversely proportional to each other,
 – the graph of y against x is a hyperbola.



- the graph of y against $\frac{1}{x}$ is a straight line.

