

Linear Laws

“Suitable manipulation of variables enables you to manipulate many equations into straight line graphs of the form $y = mx + c$ ”

Original Equation	Rearrange To	X Variable	Y Variable	Gradient
$y = \frac{k}{x}$	$y = k \frac{1}{x}$	$\frac{1}{x}$	y	k
$y = x^2$	$\log y = 2 \log x$	$\log x$	$\log y$	2
$y^3 = ax^3 + bx^2$	$\frac{y^3}{x^2} = ax + b$	x	$\frac{y^3}{x^2}$	a
$y = ax^2 + b$	(none required)	x^2	y^3	a
$\frac{1}{x} + \frac{1}{y} = k$	$\frac{1}{y} = -\frac{1}{x} + k$	$\frac{1}{x}$	$\frac{1}{y}$	-1
$y = ax^n$	$\log y = n \log x + \log a$	$\log x$	$\log y$	n
$y = ab^x$	$\log y = x \log b + \log a$	x	$\log y$	$\log b$

Process for completing linear laws questions:

1. Rearrange into format $Y = mX + c$
2. Add data rows for X and Y as necessary
3. Plot X against Y
4. Gradient is m value
5. Y intercept is c value