

Proportionality Sheet

$$7. \quad R \propto \frac{L}{d^2}$$

$$R = \frac{kL}{d^2}$$

$$Rd^2 = kL$$

$$k = \frac{Rd^2}{L}$$

$$k = \frac{(9 \Omega)(0.125 \text{ cm})^2}{16 \text{ m}}$$

$$k = 0.00879 \frac{\Omega \text{ cm}^2}{\text{m}}$$

$$R = 0.0879 \frac{L}{d^2}$$

$$9. \quad P \propto W^3$$

$$P = kW^3$$

$$k = \frac{P}{W^3}$$

$$k = \frac{150 \text{ Watts}}{\left(16 \frac{\text{km}}{\text{h}}\right)^3}$$

$$k = 0.0366$$

Graphical Analysis of Data

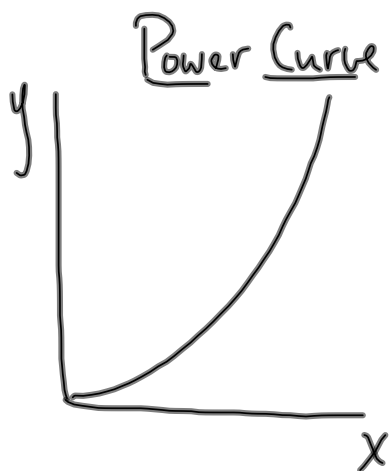


$$y \propto x$$

$$y = kx$$

$$(y = mx + b)$$

A graph of y vs x is linear with slope of k and a y -intercept of zero

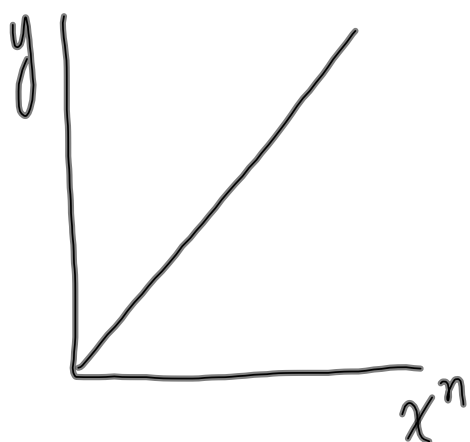


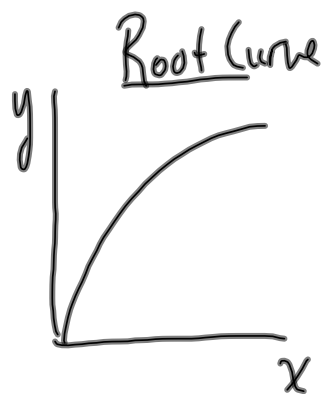
$$y \propto x^n$$

$$y = kx^n$$

$$(y = mx + b)$$

A graph of y vs x^n will be linear with a slope of k and a y -intercept of zero





$$y \propto \sqrt[n]{x}$$

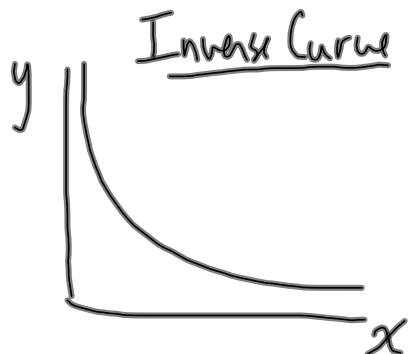
$$y = k \sqrt[n]{x}$$

$$(y = m x + b)$$

Arrows indicate the mapping: y in the second equation maps to y in the third; k maps to m ; $\sqrt[n]{x}$ maps to x ; and b is marked with $=0$.



A graph of y vs $\sqrt[n]{x}$ will be linear with a slope of k and a y -intercept of zero

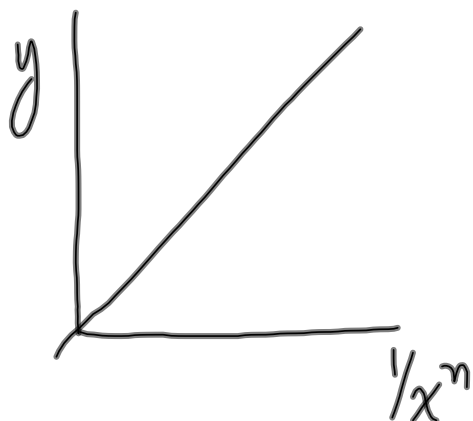


$$y \propto \frac{1}{x^n}$$

$$y = k \left(\frac{1}{x^n} \right)$$

$$(y = m x + b)$$

Arrows indicate the mapping: y in the second equation maps to y in the third; k maps to m ; $\frac{1}{x^n}$ maps to x ; and b is marked with $=0$.



A graph of y vs $\frac{1}{x^n}$ will be linear with a slope of k and a y -intercept of zero