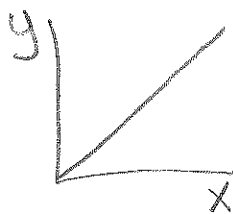


Topic 2D: Graphical Relationships

Skill 19: Recognizing Graphical Patterns (ie relationships between dependent (y) and independent (x))

Direct Relationships: As independent variable increases, dependent variable increases ...
or as independent variable decreases, dependent variable decreases ...

according to the function of "x" ...

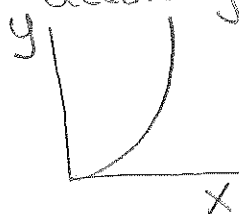


Direct
 $y = mx$

whatever happens to "x" happens to "y"

x	y
2x	2y
3x	3y
4x	4y
$\frac{1}{2}x$	$\frac{1}{2}y$
$\frac{1}{4}x$	$\frac{1}{4}y$

Ex: $d = vt$ (equilibrium)



Direct square
 $y = mx^2$

whatever change happens to "x" that change "squared" happens to y

x	y
2x	$2^2 y = 4y$
3x	$3^2 y = 9y$
$\frac{1}{2}x$	$(\frac{1}{2})^2 y = \frac{1}{4}y$
$\frac{1}{4}x$	$(\frac{1}{4})^2 y = \frac{1}{16}y$
$\frac{1}{6}x$	$(\frac{1}{6})^2 y = \frac{1}{36}y$
$\frac{1}{10}x$	$(\frac{1}{10})^2 y = \frac{1}{100}y$

Ex: $d = \frac{1}{2}at^2$



Direct square root
 $y = m\sqrt{x}$

whatever change happens to x the square root of that change happens to y

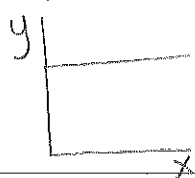
x	y
2x	$\sqrt{2}y = 1.4y$
3x	$\sqrt{3}y = 1.7y$
4x	$\sqrt{4}y = 2y$
9x	$\sqrt{9}y = 3y$
$\frac{1}{4}x$	$\sqrt{\frac{1}{4}}y = \frac{1}{2}y$
$\frac{1}{9}x$	$\sqrt{\frac{1}{9}}y = \frac{1}{3}y$
$\frac{1}{25}x$	$\sqrt{\frac{1}{25}}y = \frac{1}{5}y$

Ex:

$$t = \sqrt{\frac{2d}{g}}$$

$$V_c = \sqrt{2ad}$$

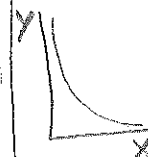
No Relationship



$y \neq x$

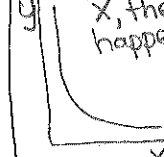
Ex: $a \neq t$ for falling object

Inverse - whatever happens to x, the opposite happens to y



x	y
2x	$\frac{1}{2}y$
10x	$\frac{1}{10}y$
$\frac{1}{2}x$	2y
$\frac{1}{10}x$	10y

Inverse Square - whatever happens to x, the opposite squared happens to y



x	y
2x	$\frac{1}{2^2}y = \frac{1}{4}y$
$\frac{1}{2}x$	$\frac{1}{(\frac{1}{2})^2}y = 4y$
$\frac{1}{10}x$	$\frac{1}{(\frac{1}{10})^2}y = 100y$
$\frac{1}{4}x$	$\frac{1}{(\frac{1}{4})^2}y = 16y$