

Notes

Topic 02: Identifying Linear Functions

There are two questions:

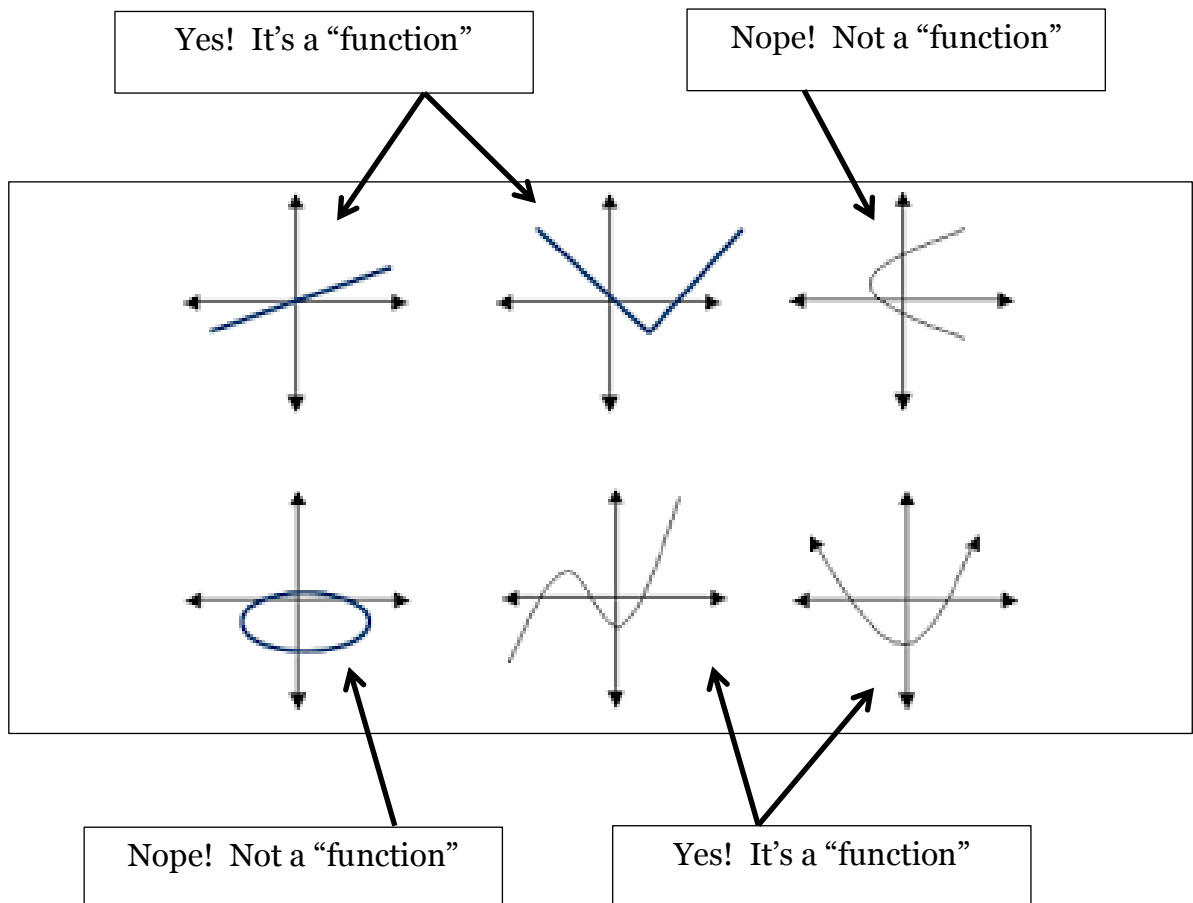
- 1 Is it a function?

Does a graph pass the vertical line / karate chop test

Does a data set repeat X-values (not ok!)

- 2 Is an equation linear or non-linear?

A graph is linear when it passes the “vertical line test”, or the “karate chop test”. When you can cut straight up and down any place on the graph and go through the line **more than once**, then the line is **not a function**.



Notes

A data set is **not a function** when any X-value is repeated. Repeating a Y-value is OK.

X	15	25	23	22	27	30
Y	75	80	75	80	85	75

Yes! It's a "function".
It is OK that the Y-values repeat.

X	72	77	72	75	78	80
Y	45	50	48	52	58	60

Nope! Not a "function".
The X-value of "72" is repeated.

An equation is linear when it is in classic "y = mx + b" form. When the X is raised to a power (like x^2) or put in the denominator (like $\frac{2}{x}$), then the equation is **non-linear**. When the X is multiplied by 2 (like $2x$) or $\frac{1}{2}$ (like $\frac{x}{2}$) or a negative number, then the equation is still **linear**.

$$y = x - 2$$

$$y = 2x + 2$$

$$y = \frac{x}{2} + 2$$

$$y = -2x + 2$$

$$y = -\frac{x}{2} - 2$$

$$y = x^2 + 2$$

$$y = \frac{2}{x} + 2$$

Linear

Non-Linear