

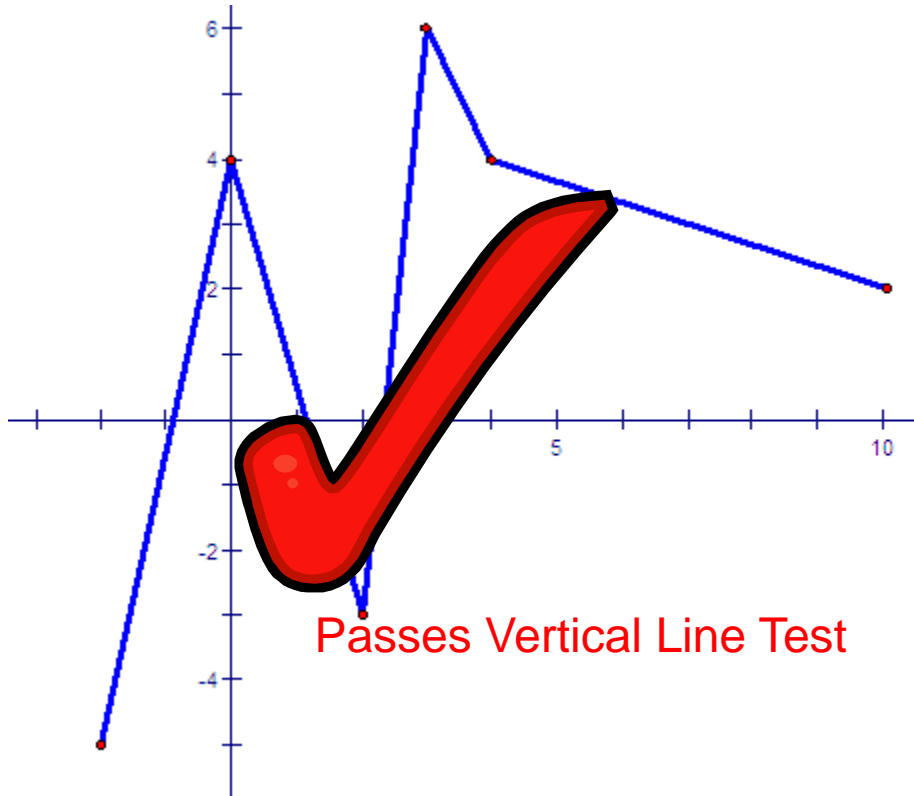
# More Functions

# Is it a function?

$\{(1,2), (2,3), (3,4), (6,11), (3,2)\}$



X = 3 is repeated....



x	y
-1	1
0	2
1	3
1	4
2	5

X = 1 is repeated....

# Functions?

- $4(2) + 2 = ?$

- $5^2 = ?$

Each expression on the left represents a function (or not) - Can you name the function?

- Linear (eg.  $Y = 4x + 2$ )
- Quadratic (eg.  $Y = x^2$ )
- Squareroot ( $y = \pm\sqrt{x}$ )

**An equation is a Function if there is only one result when a evaluated at x.**

# Domain and Range of a Function

## **Definition of the Domain of a Function**

- The set of the first coordinates of the ordered pairs in the function. (i.e. independent values, x values)

## **Definition of the Range of a Function**

- The set of the second coordinates of the ordered pairs in the function. (i.e. dependent values, y values)

# Representing Domain and Range

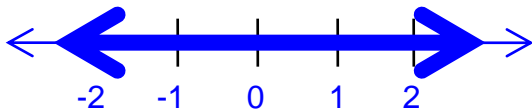
- Example – Graph  $y = x^2$

## DOMAIN

\*The arrows mean that the graph keeps going

$$x \in \mathbb{R}$$

X is in the set of real numbers



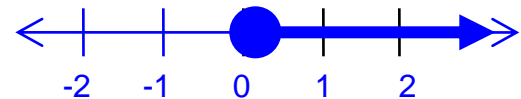
...-3.1, -3, .....0, ...0.5, ...3.5...

## RANGE

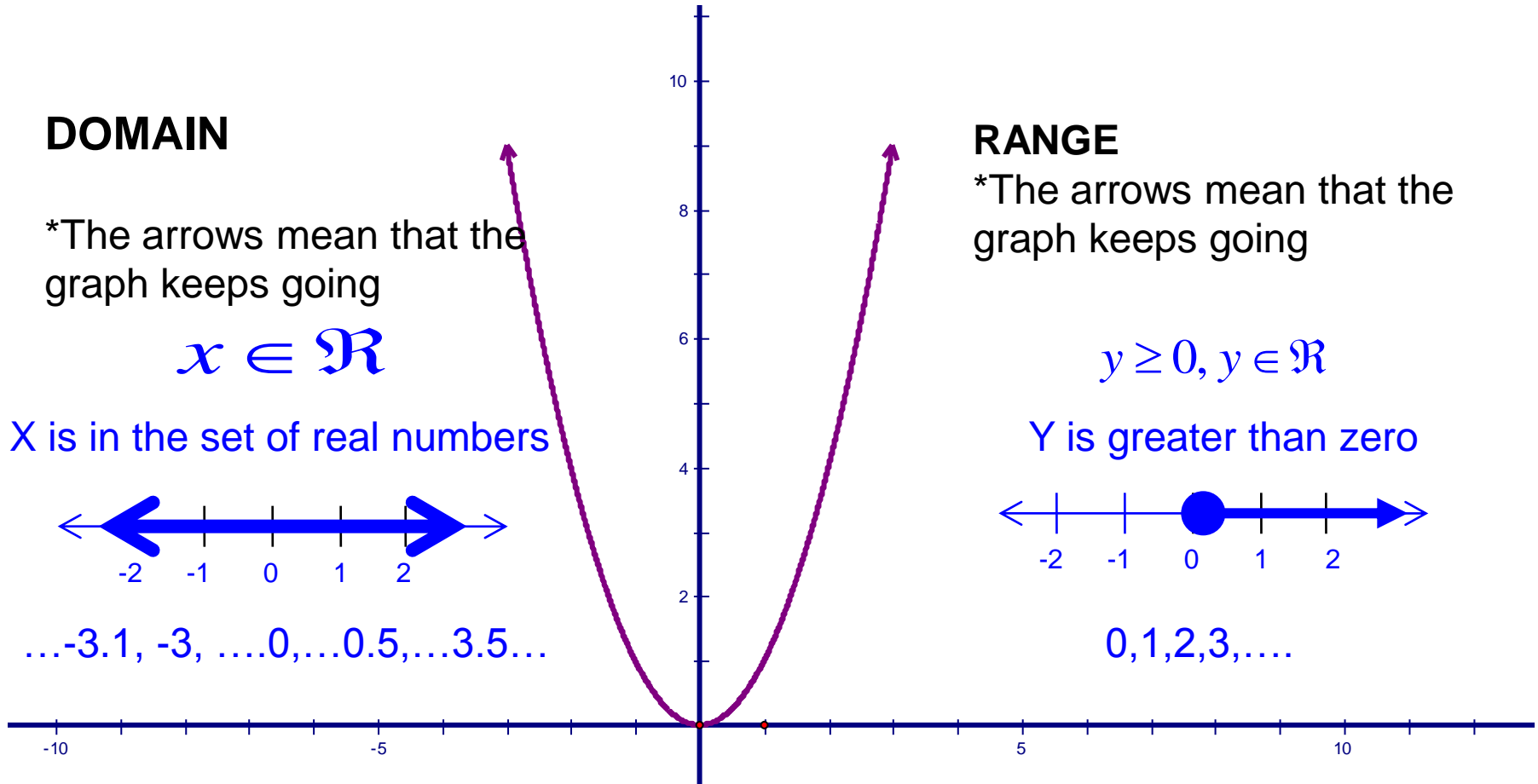
\*The arrows mean that the graph keeps going

$$y \geq 0, y \in \mathbb{R}$$


Y is greater than zero



0, 1, 2, 3, .....

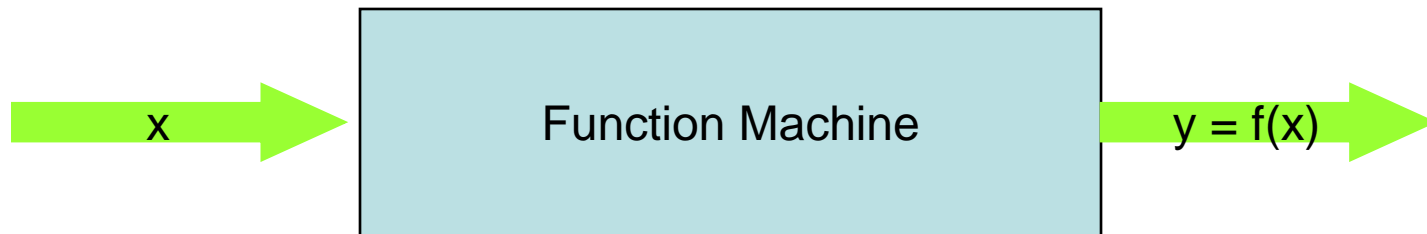


# Representing Domain and Range

<p><b>Words</b></p> <p>x is between 0 and 8 inclusive.</p>	<p><b>Number Line</b></p>  <p>A number line with tick marks at 0, 2, 4, 6, and 8. Solid black circles are placed at 0 and 8. A thick black line segment connects these two circles. Arrows at the ends of the line indicate that the domain extends beyond 0 and 8.</p>
<p><b>Inequality Statement</b></p> $0 \leq x \leq 8$	<p><b>List of Numbers</b></p> <p>0, ..., 2, ..., 4, ..., 6, ..., 8</p>

# Function Notation

- A Function is like a machine. When an  $x$ -value in the domain is entered, the machine produces output.



$f(x)$  is the value of the function  $f$  at  $x$

x-y Notation

$$y = 2x + 3$$

Function Notation

$$f(x) = 2x + 3$$

# Evaluating a Function

Evaluate  $f(5)$

- When  $x = 5$ , the value of  $y$ , or  $f(5)$  is 13 because

$$2 \times 5 + 3 = 13$$

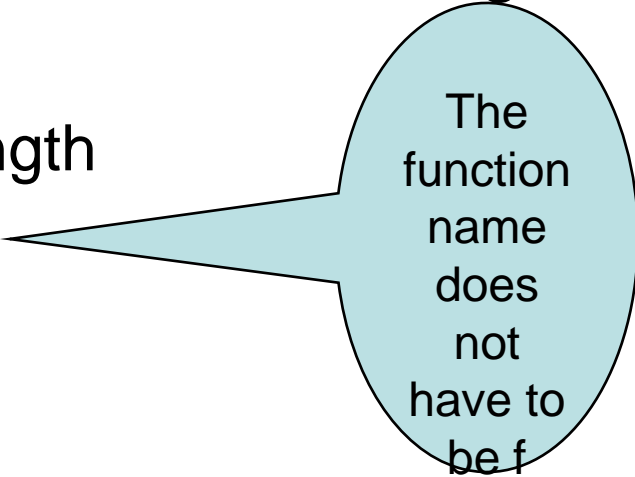
$$f(x) = 2x + 3$$

$$\begin{aligned} f(5) &= 2(5) + 3 \\ &= 13 \end{aligned}$$

# Problem

- Write an equation that expresses the surface area of a cube as a function of its length. Determine the surface area of a cube with edge length 2.5 cm.
  - Recall  $SA = 6x^2$  where  $x$  is the length
  - In Function Notation,  $SA(x) = 6x^2$

$$SA(2.5) = 6(2.5)^2$$
$$= 37.5$$



The function name does not have to be f

# Problems

- Domain/Range worksheet
- Textbook p. 118 #2,5,6,9,10,11,19,22,32
- p. 179 # 7,9 (ace),11,19,26,32