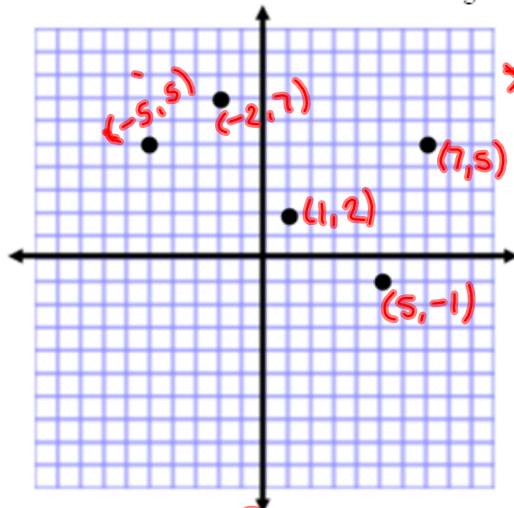


Scheduled Review

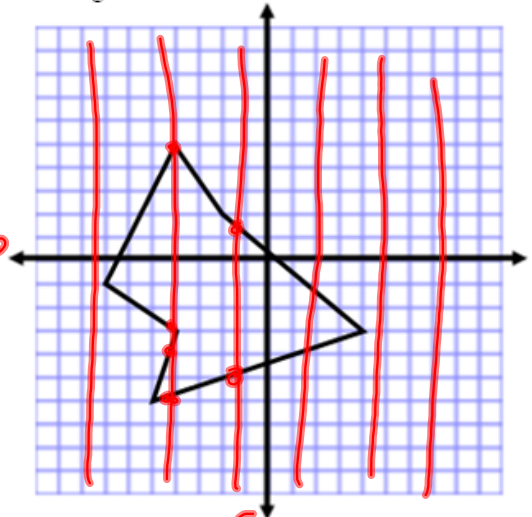
What is the domain and range for each of the following?



Domain $\{-5, -2, 1, 5, 7\}$
 Range $\{5, 7, 2, -1\}$

Points mean discrete

continuous →

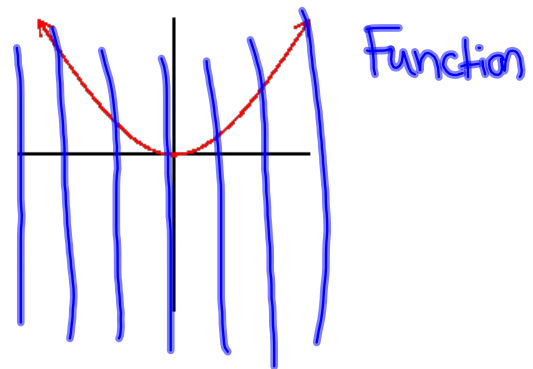
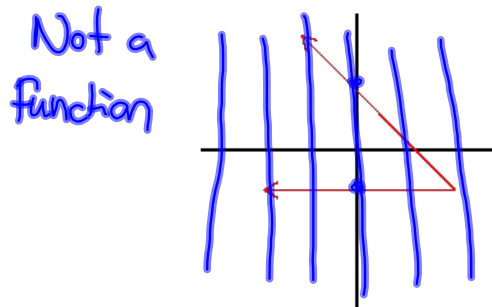
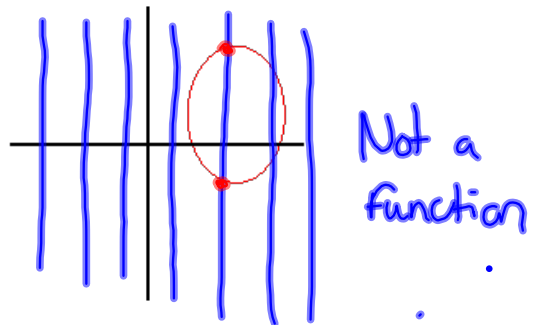
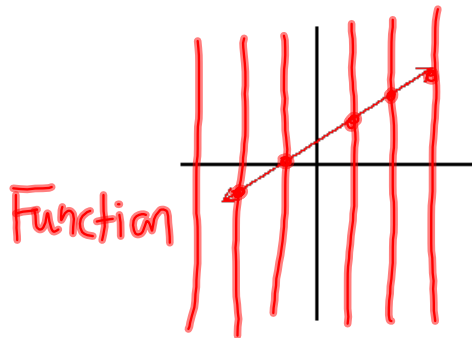


Domain $\{x \mid -7 \leq x \leq 4, x \in \mathbb{R}\}$
 Range $\{y \mid -6 \leq y \leq 5, y \in \mathbb{R}\}$

L4: Functions

A function is a special relation in which for every x there is only one value of y . One of the easiest ways to see this is with graphs. To do this we do what is called the vertical line test, this is where you have an imaginary vertical line that you move left and right. If the line only crosses the graph at one or no points it's a function. If it hits the graph at more than one point then it is not a function.

State which graphs are functions and which are not.



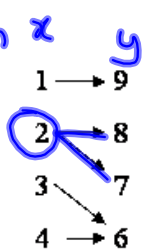
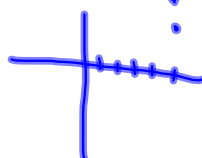
With arrow diagrams, ordered pairs, table of values you need to make sure that there are no x values that repeat. If they do they must contain the same y values to be a function. If they are different then they are not a function.

State which are functions

X	Y
2	4
3	4
4	8
5	9

Function

X	Y
5	6
5	8
6	9
7	11



Not a function

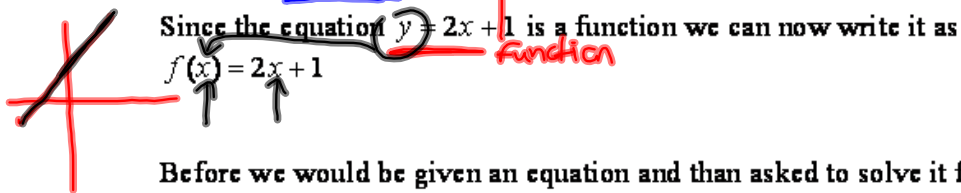
Function

- (2,4)
- (4,8)
- (6,12)
- (8,16)

Function Notation

To show that an equation of a graph that is a function, we no longer write the equation as $y = \underline{\quad}$ but as $f(x) = \underline{\quad}$. This is read as "f of x" or "f at x".

Since the equation $y = 2x + 1$ is a function we can now write it as $f(x) = 2x + 1$. *function*



Before we would be given an equation and then asked to solve it for a certain x value.

Eg For $y = x + 5$ solve for y when $x = 3$

We can do the exact same thing with function notation

Eg for $f(x) = 3x - 8$ solve

$$\begin{aligned} f(2) \quad x=2 \\ f(2) &= 3(2) - 8 \\ f(2) &= -2 \end{aligned}$$

$$\begin{aligned} f(-6) \quad x=-6 \\ f(-6) &= 3(-6) - 8 \\ &= -26 \end{aligned}$$

$$\begin{aligned} f(\sqrt{3}) \quad x=\sqrt{3} \\ f(\sqrt{3}) &= 3(\sqrt{3}) - 8 \\ &= 5.2 - 8 \\ &= -2.8 \end{aligned}$$

We may also be asked to replace x with an algebraic expression

Eg for $f(x) = -5x + 6$ solve for

$$\begin{aligned} f(3n) \quad x=3n \\ f(3n) &= -5(3n) + 6 \\ &= -15n + 6 \end{aligned}$$

$$\begin{aligned} f(n+4) \quad x=n+4 \\ f(n+4) &= -5(n+4) + 6 \\ &= -5n - 20 + 6 \\ &= -5n - 14 \end{aligned}$$

* Since these are not like terms. ∴ can't combine.*

For the same function $f(x) = -5x + 6$ solve for x when

$$\underline{f(x) = -34}$$

$$-5x + 6 = -34$$

$$-5x + \cancel{6} - \cancel{6} = -34 - 6$$

$$\cancel{\frac{-5x}{-5}} = \frac{-40}{-5}$$

$$\boxed{x = 8}$$

$$f(x) = 16$$

$$-5x + 6 = 16$$

$$-5x + \cancel{6} - \cancel{6} = 16 - 6$$

$$\cancel{\frac{-5x}{-5}} = \frac{10}{-5}$$

$$\boxed{x = -2}$$

Homework P 294 #5, 6, 8 (only the function part)

P 272 #14, 15, 16(b,c), 17, 18