Please put up your phones and take your seats.

If you have not given me your pre-assessment, please do so ASAP.

What is a function?

- Write your thoughts on a scratch piece of paper.
- Create a group definition. Be prepared to share.

Function Vocab

- <u>Function</u>--A relation in which each element of the domain is paired with exactly one element in the range
- <u>Domain</u>--input, x values, independent variable
- <u>Range</u>--output, y values, dependent variable
- In a function, an element of the domain may not be paired with 2 different elements of the range (x cannot repeat)
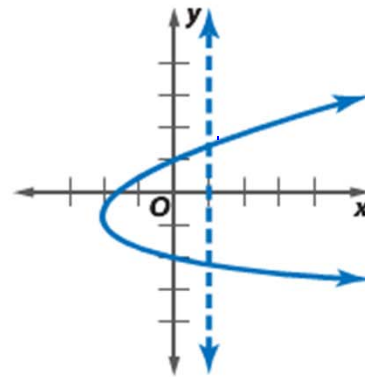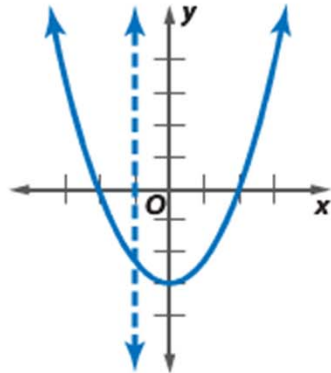
Vertical Line Test

Words

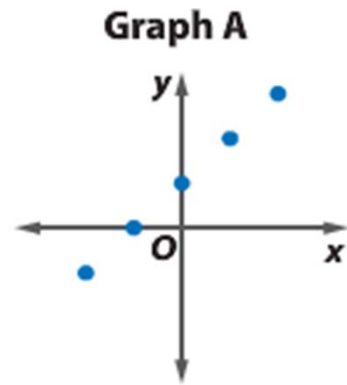If no vertical line intersects a graph in more than one point, the graph represents a function.

If a vertical line intersects a graph in two or more points, the graph does not represent a function.
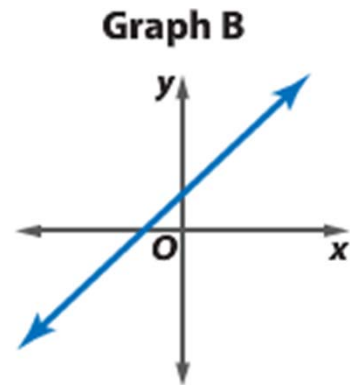
Models

(1, 1.5)

(1, -25)

Discrete vs Continuous

Graph A

discrete relation

Graph B

continuous relation

Function or not?

1. {(-6, -1), (-5, -9), (-3, -7), (-1, 7), (6, -9)} *yes*

2.

x	2	-1	-2	-1	-2
y	-2	-1	0	1	2

No

3. *No*

4.

Domain		Range
−3		0
−2		2
−1		4
0		6
1		8
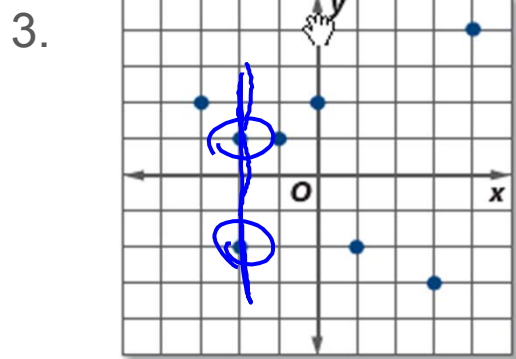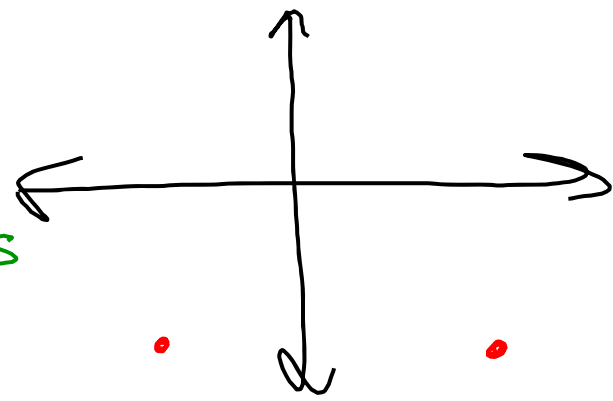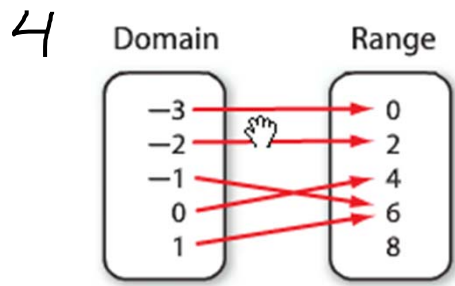
Yes

Function Notation

$$y = 5x - 1$$

$$f(x) = 5x - 1$$

What is y when x = -6?

What is f(-6)?

$$y = 5(-6) - 1 = -31$$

$$f(-6) = 5(-6) - 1 = -31$$

$$f(-6) = -31$$

Function Notation?

$(2y)^2 = 2^2 y^2 = 4y^2$

1. Given $f(x) = 2x^2 - 8$, find each value.

a. $f(6) = 2(6)^2 - 8$
$= 64$

b. $f(2y) = 2(2y)^2 - 8$
$= 2(4y^2) - 8$
$= 8y^2 - 8$

$(4a)^2 = 4^2 a^2$

2. Given $g(x) = 0.5x^2 - 5x + 3.5$, find each value.

a. $g(2.8) = 0.5(2.8)^2 - 5(2.8) + 3.5$
$= -6.58$

b. $g(4a) = 0.5(4a)^2 - 5(4a) + 3.5$
$8a^2 - 20a + 3.5$

$$f(E + 15)$$

$$f(E) + 15$$

$$f(n) = 3^{n}$$

$$f(x) = 4x + 1$$

Functioning Well

$$f(x) + 2$$

$$f(7) + 2 = 31$$

$$6 \quad p = f(E) + 2$$

Complete sheet with a partner

$$f(x+2)$$

$$f(7+2) = f(9)$$

$$= 37$$

$$8 \quad p = f(E+2)$$

Vincent   Kara   Roman

Painting the Bridge

Painting the bridge

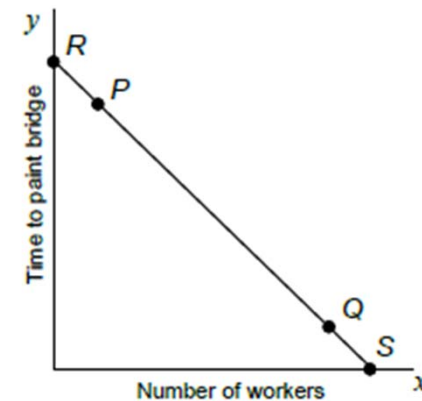A group of workers are planning to paint a bridge.

x = the number of workers

y = the length of time it will take the workers to paint the bridge

Painting the Bridge

- What does point P tell you?
- What about point Q?
- What about points R and S, where the line crosses the graph?
- How can we change this graph so that it is a better model of the situation?

Painting the Bridge, Revised

- Suppose we know the time it takes for a specific number of workers to paint the bridge. $10w \Rightarrow 5hrs$
- What would happen if we doubled the number of workers that paint the bridge? $20w \rightarrow 2.5h$
- What would this look like on the graph? *exponential*
- If we halved the number of workers, what would this look like?
- Will these points be a straight line?
- What shape will these points make?

Painting the Bridge, Revised
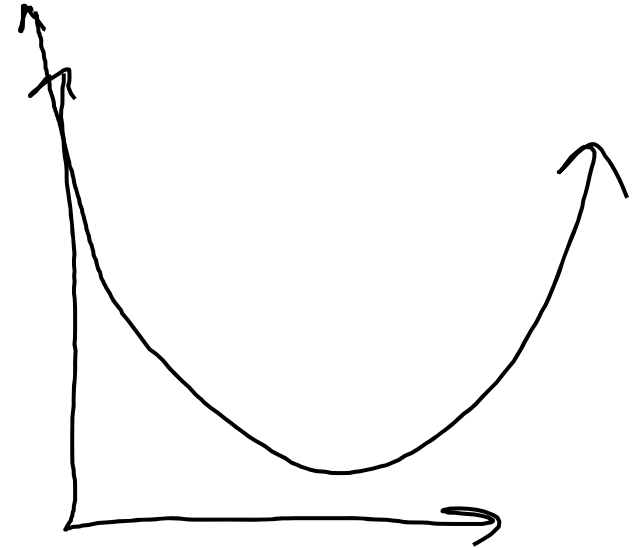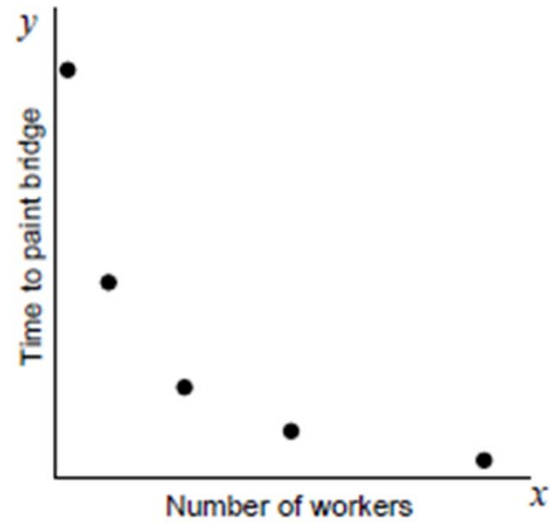
Matching the Cards

1. Take turns to match a situation card to one of the sketch graphs.

2. If you place a card, explain why that situation matches the graph.

3. If you think the graph could be improved in any way, then say how it should be changed. (For example, you may think that it should be discrete points rather than a continuous line.)

4. Arrange cards side by side (not on top of one another) so I can see them as I walk round.

1. Names
2. Create table with Situation, Graph, Equation

Everyone in your group should agree on and be able to explain your choice.

Revisit Pre-Assessment

Re-do your pre-assessment based on your new knowledge