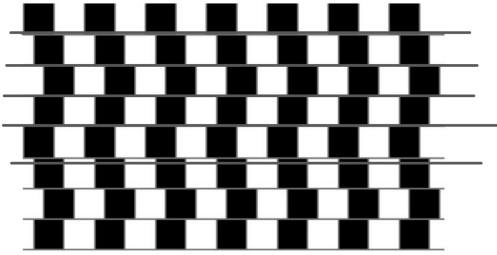


M10C Unit 5 - Relations and Functions

Linear Functions



Are the horizontal lines parallel or do they slope?

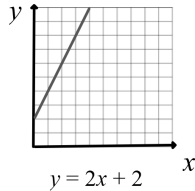
POS Checklist

- Determine whether a situation represents a linear relation, and explain why or why not.
- Determine whether a graph represents a linear relation, and explain why or why not.
- Determine whether a table of values or a set of ordered pairs represents a linear relation, and explain why or why not.
- Draw a graph from a set of ordered pairs within a given situation, and determine whether the relationship between the variables is linear.
- Determine whether an equation represents a linear relation, and explain why or why not.
- Match corresponding representations of linear relations.

- Explain why data points should or should not be connected on the graph for a situation.

Linear Relations

Linear relations have graphs that are straight lines.



Some other ways of describing linear relations:

Words: "Two times x plus two gives y."

Equation: $y = 2x + 2$

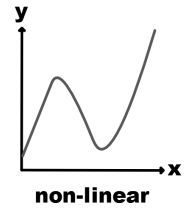
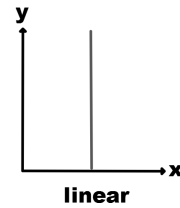
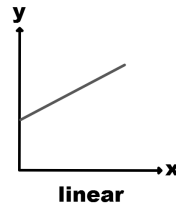
Ordered Pairs: (1, 4), (2, 6), (10, 22)...

x	y
1	4
2	6
3	8
4	10

Table of Values

How can you tell it's linear from... a graph?

Linear graphs are always straight lines.



How can you tell it's linear from...

an equation?

Linear equations always have a degree of 1 (the variables have no exponents other than +1)

$$y = \frac{1}{2}x - 5$$

$$y = -3x + 3.5$$

linear

$$y = \sqrt{x} + 5$$

$$y = 3x^2 - 2$$

non-linear

How can you tell it's linear from...

a table?

The values of x increase by a constant amount, and the value of y increase by a constant amount (except horizontal and vertical lines).

x	y	x	y
4	3	1	-2.5
5	5	2	0
6	7	3	2.5

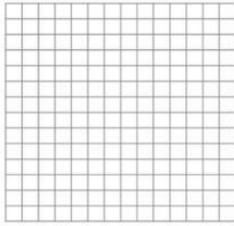
linear

x	y
7	49
8	64
9	81

non-linear

Graphing Ordered Pairs

ex) The cost of renting a boat is a \$10 flat rate and \$2 per hour. Draw a graph to determine if the relation is linear.

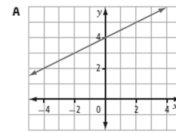


Match-a-Graph



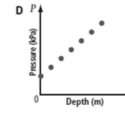
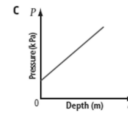
a) The pressure, P , that a scuba diver experiences under water increases at a constant rate relative to the diver's depth, d , below the surface.

b) $y = \frac{1}{2}x + 4$



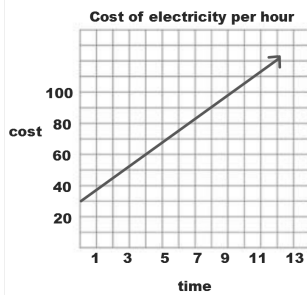
B

x	y
0	4
1	8
2	12
3	16



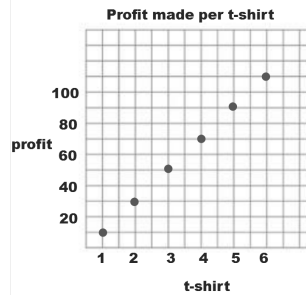
E One number is half another number increased by four.
 F (0, 101), (25, 176), (50, 251), (75, 326), (100, 401), (125, 476)

Continuous vs. Discontinuous Data



Continuous Data: there is information between the points on a graph; you may connect the points.

ex) Cost of electricity per hour.



Discontinuous Data: there is no information between the points on a graph; you may not connect the points.

ex) The profit made per t-shirt sold.

Another term for discontinuous is discrete.

Practice: page 287 - 291 #1 - 12