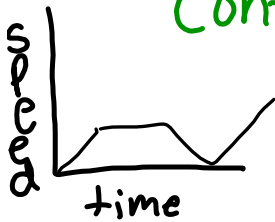


Chapter 3 - Functions

Describe the situation in each graph, then tell if it's discrete or continuous.



continuous
 Speed of a car increases, then stays constant, then decreases to a stop, finally increases again.



discrete
 number of books bought went up and down over the years

Function: exactly one domain for each range
• Domain does NOT Repeat! has to pass VLT

Relation: set of ordered pairs

domain: x-value, independent variable, input, 1st number in ordered pair

Range: y-value, dependent variable, 2nd value in ordered pair, output

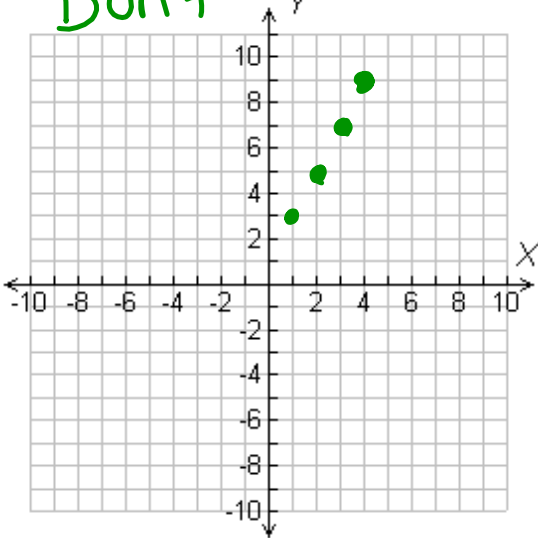
Table:

X	Y
1	3
2	5
3	7
4	9

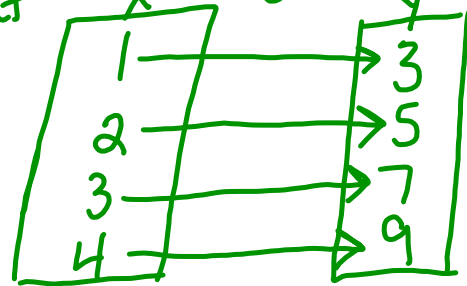
Write in a table, mapping diagram, then graph.

$$\{(1, 3), (2, 5), (3, 7), (4, 9)\}$$

Don't connect



OK to repeat Mapping Diagram:



Independent variable - input, Controls the situation
X

Dependent Variable - output, relies on the independent variable.
Y

A carpenter needs to buy wood for a kitchen table.

1st
indep → Independent: amount of wood bought
dep → Dependent: \$ (cost of wood bought)

An athletic coach needs to buy new uniforms for the team.

Independent: # of jerseys needed
Dependent: cost

A teacher needs to buy classroom supplies. It is \$.15 per pencil.
Write a function for the possible cost of pencils.

Independent: # of pencils needed

Dependent: cost

function: $f(x)$ $f(x) = 0.15x$

$$h(x) = 2x + 5 \quad \text{find when } x = 3, 5, \text{ and } 7$$
$$h(3) = 2(3) + 5$$
$$h(3) = 11$$
$$h(5) = 2(5) + 5$$
$$h(5) = 15$$

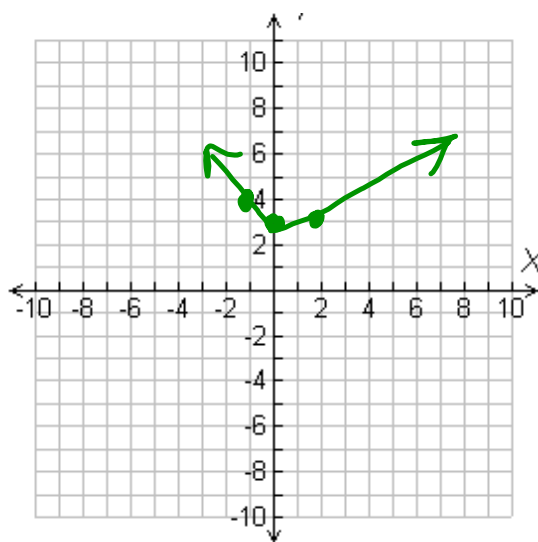
x	1	2	3	4
y	3	5	7	9

Determine the relationship.

$$y = 2x + 1$$

$$g(x) = |x-1| + 2 \quad \text{Graph}$$

X	Y
0	3
-1	4
2	3

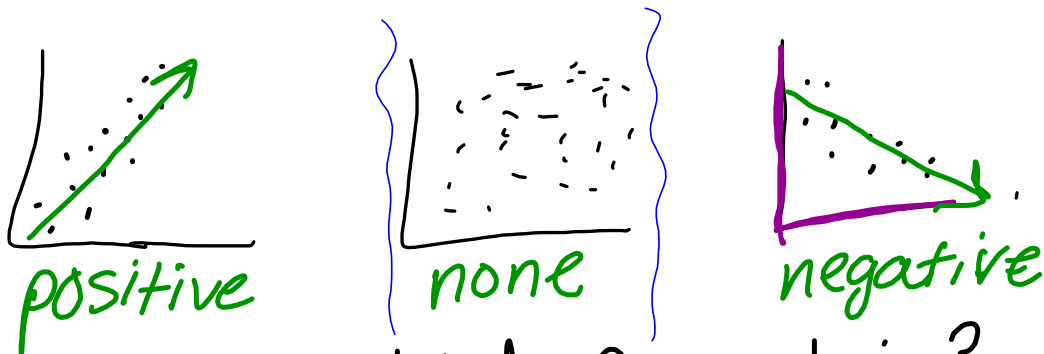


★

$|x| =$ V-shape
↕↕

$x^2 =$ Parabola
↪↪

$x =$ Linear
↙↘



What kind of correlation?

Draw the trend line.

↳ draw a line in general direction of points

Arithmetic Sequences

10, 8, 6, 3, 1 ...
 -2 -2 -3

not arithmetic
 (must be consistent)

-2, 3, 8, 13, ...
 $+5$ $+5$ $+5$

arithmetic

$a_1 =$ 1st term

$n =$ whatever # term we want to find

$d =$ common difference

$a_n =$

Find the 109th term:

$$\star a_n = a_1 + (n-1)d$$

$$a_1 = -2$$

$$n = 109$$

$$d = 5$$

$$a_n = -2 + (109-1) \cdot 5$$

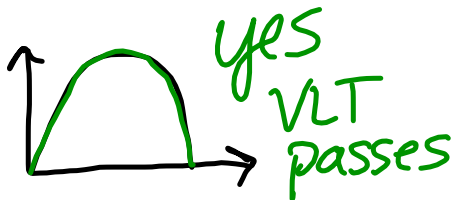
$$a_n = -2 + 108 \cdot 5$$

$$a_n = -2 + 540$$

$$a_n = \boxed{538}$$

PEMDAS

State whether the following are functions or not:



no,
domain repeats

$$\{(2,0), (2,1), (3,1)\}$$


yes, domain is
different everytime

$$\{(6,5), (5,6), (7,5)\}$$
