

Warm-Up:

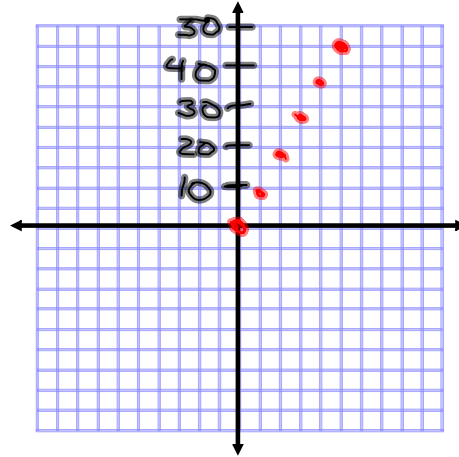
A blue whale's heart beats 9 times per minute.

1) Make a table of ordered pairs in which the x-coordinate represents the number of minutes and the y-coordinate represents the number of heartbeats.

x	y
0	0
1	9
2	18

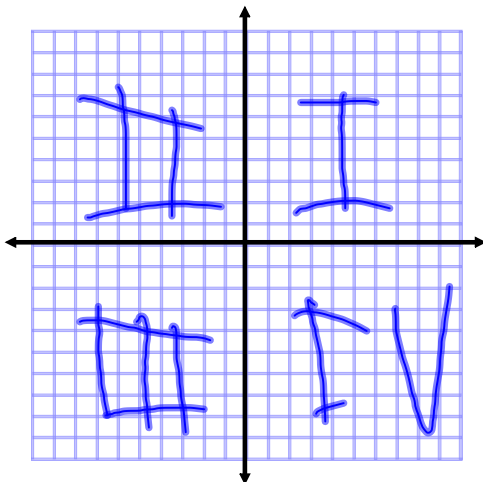
x	y
3	27
4	36
5	45

2) Graph the ordered pairs.



Sep 6-11:44 AM

Name the quadrants of this Cartesian coordinate plane.



Sep 6-11:47 AM

Section 2-1: Relations and Functions

A **relation** is a set of ordered pairs, such as one for the number of heartbeats of a whale.

The **domain** of the relation is the set of all the first coordinates (the x's).

The **range** of the relation is the set of all the second coordinates (the y's).

What is the domain and range of the following relation?

$\{(0, 0), (1, 9), (2, 18), (3, 27)\}$

Domain: $\{0, 1, 2, 3\}$

Range: $\{0, 9, 18, 27\}$

Sep 6-11:49 AM

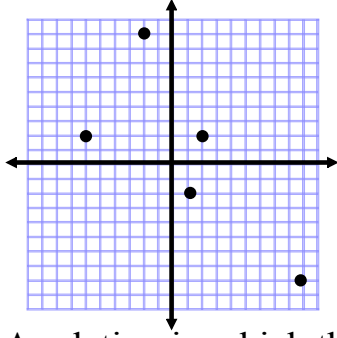
A **function** is a special type of relation in which each element of the domain goes with *only one* element of the range.

ie. some number from the domain can not be linked to two numbers from the range.

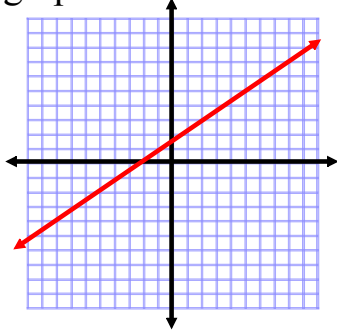
A **one-to-one function** links one member of the range with only one member of the domain.

Sep 6-11:51 AM

A relation in which the domain is a set of individual points is **discrete**.



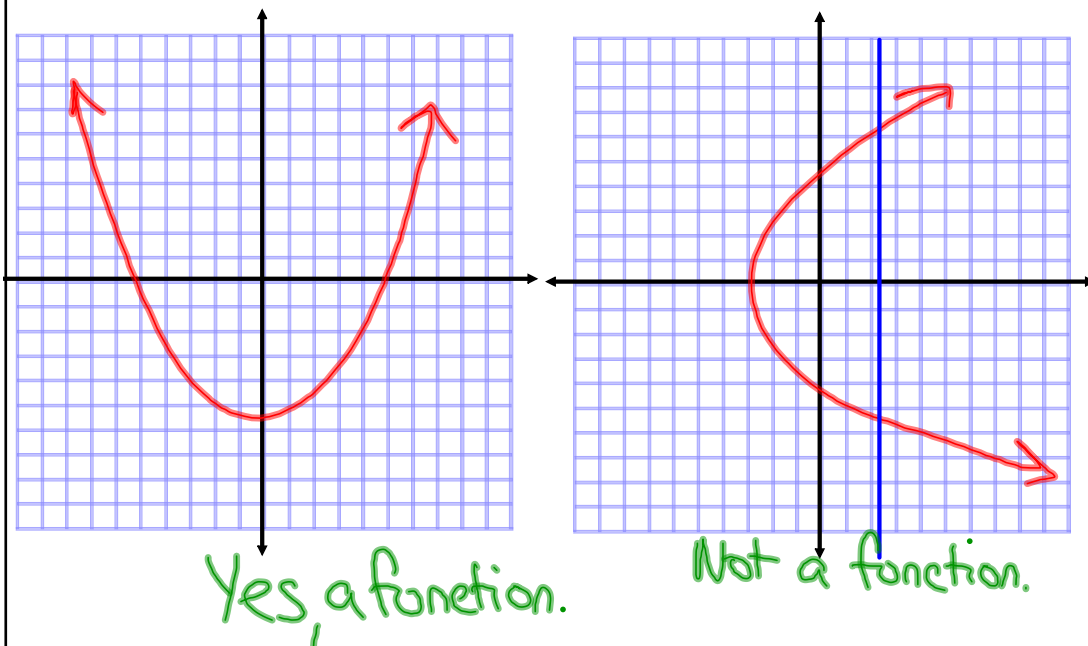
A relation in which the domain has an infinite number of points and can be graphed with a line or smooth curve is called **continuous**.



Sep 6-11:57 AM

To test if a graph is a function, use the **vertical line test**.

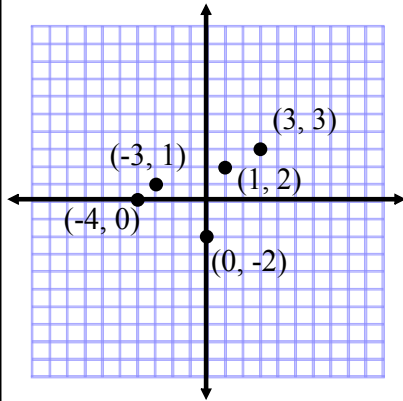
If there is no vertical line that intersects the graph in two or more places, then the graph represents a function.



Sep 6-12:00 PM

Examples:

1) State the domain and range of the relation shown in the graph. Is the relation a function?



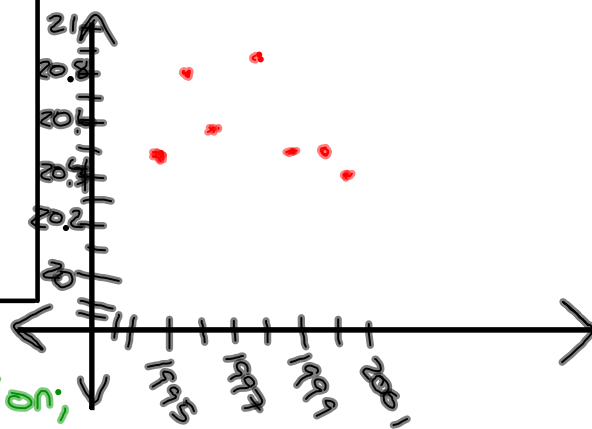
Domain: $\{-4, -3, 0, 1, 3\}$
 Range: $\{0, 1, 2, 3, -2\}$
 Yes, a function.

Sep 6-11:54 AM

Examples:

2) The table shows the average fuel efficiency in miles per gallon for light trucks for several years. Graph this information and determine whether it represents a function. Is the relation *discrete* or *continuous*?

Year	Fuel Efficiency (mi/gal)
1995	20.5
1996	20.8
1997	20.6
1998	20.9
1999	20.5
2000	20.5
2001	20.4



Source: U.S. EPA

Yes, a function;
discrete

Sep 4-1:52 PM

Examples:

3) Given $f(x) = x^3 - 3$, find each value.

$$y = f(x)$$

a) $f(-2) = (-2)^3 - 3 = -8 - 3$ $f(-2) = -11$

b) $f(5) = (5)^3 - 3 = 125 - 3$ $f(5) = 122$

c) $f(\text{cow}) = (\text{cow})^3 - 3$

d) $f(\text{dollar sign}) = (\text{dollar sign})^3 - 3$

e) $f(2t) = (2t)^3 - 3 = 8t^3 - 3$

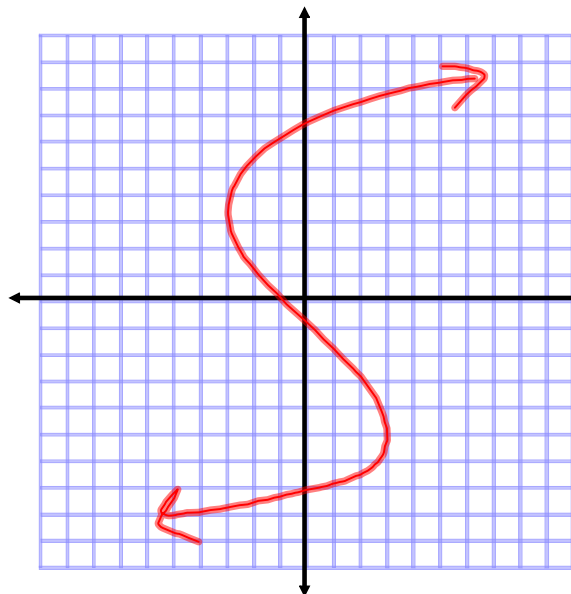
$$f(2t) = 8t^3 - 3$$

$$f(x-1) = (x-1)^3 - 3$$

Sep 4-1:58 PM

Homework: pg 62-64 #13-22 all, 24-42 even, 54, 59, 60

17)



D: All Real #s

R: All Real #s

Not a function.

Sep 6-12:10 PM