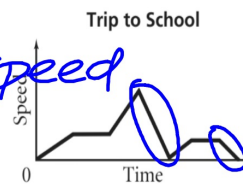


The graph shows the speed a student traveled on the way to school.

1. What do the flat parts of the graph represent?

2. Circle the sections of the graph that show the speed decreasing.



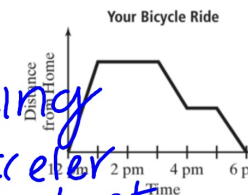
constant speed

The graph shows the relationship between time and distance from home.

3. What do the flat parts of the graph represent?

4. What do the sections from 3 P.M. to 4 P.M. and from 5 P.M. to 6 P.M. represent?

5. What does the section from 12 P.M. to 1 P.M. represent?

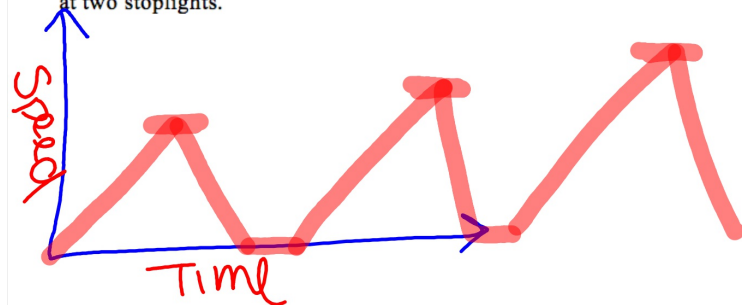


dist inc.

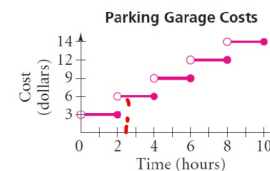
*at rest
decreasing
inc. / accelerating
constant speed*

Sketch a graph to describe the following. Explain the activity in each section of the graph.

6. The speed of a person driving to the store and having to stop at two stoplights.



2. Use the graph below to answer the following questions.



a. How much does it cost to park for 8 hours?

b. How much does it cost to park for 481 minutes?

c. If you paid \$6 for parking how long could your car have been parked in the garage?

\$12
\$12 Few cents
4 hrs.
8 hrs / min

Sec 5-2: Relations and Functions

1. What is a Relation?

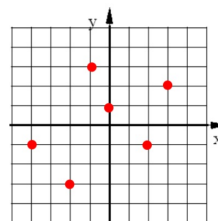
(x, y)

Relation: A set of ordered pairs.

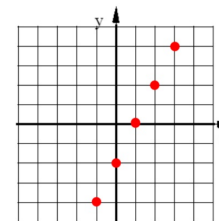
A bunch of points.

These points may or may not have a particular relationship

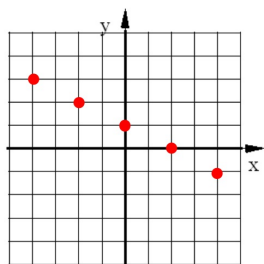
These are both Relations.



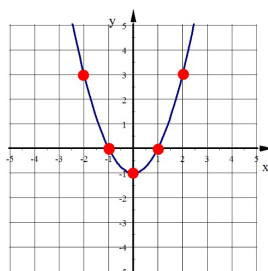
No relationship
(no correlation)



Linear Relationship
(pos correlation)



Linear Relationship
(Neg correlation)



Quadratic Relationship

2. What is the Domain of a Relation?

Domain: All the **different** x values in numerical order.

Listed in order without repeating!

3. What is the Range of a Relation?

Range: All the **different** y values in numerical order.

Listed in order without repeating!

Other names for Domain and Range

Domain

- x-coordinates
- Input
- Independent Variable

Range

- y-coordinates
- Output
- Dependent Variable

$(4, -1), (2, 3), (4, -5), (-2, 6), (1, 3)$

4. State the Domain and Range of this Relation:

Domain:

$\{-2, 1, 2, 4\}$

Range:

$\{-5, -1, 3, 6\}$

5. State the domain and range of this relation.

$(6, -1), (2, -5), (-1, 7), (9, -4), (1, 3)$

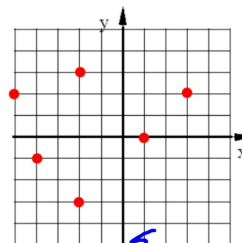
Domain:

$\{-1, 1, 2, 6, 9\}$

Range:

$\{-5, -4, -1, 3, 7\}$

State the Domain and Range of each Relation

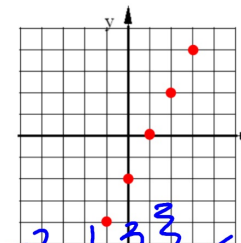


Domain:

$\{-5, -4, -2, 1, 3\}$

Range:

$\{-3, -1, 0, 2, 3\}$



Domain:

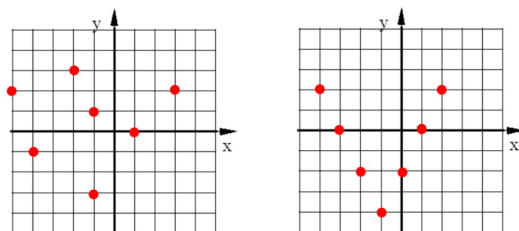
$\{-1, 0, 1, 2, 3\}$

Range:

$\{-2, 0, 2, 4\}$

These are called Discrete Graphs.

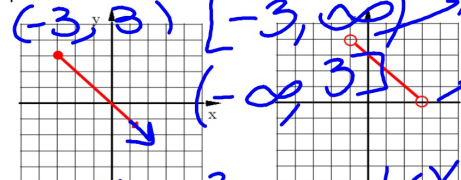
The domain and range can just be listed using all the values of x and y.



Discrete Quantity
a quantity that
can be counted

These are called Continuous Graphs.

The domain and range **can't** be listed using all the values of x and y because there are an infinite # of points. You must use **INEQUALITIES**.



Domain: $x \geq -3$
Range: $y \leq 3$

Domain: $-1 < x < 3$
Range: $0 < y < 4$
(0, 4)

Continuous Quantity
Quantity that
can't be
counted, it has
to be measured.

$x > -1$ and
 $x < 3$
(-1, 3)

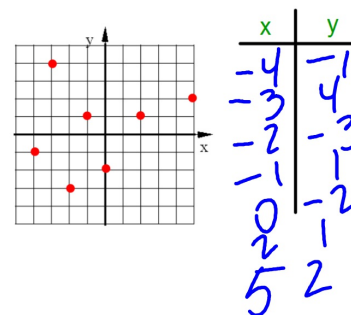
6. What is a Function?

a relation w/o
repeating
domains

Some Relations are called Functions.

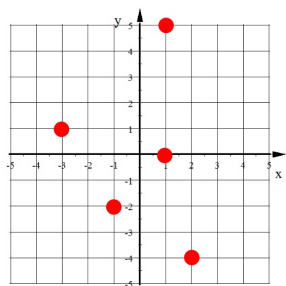
Every x value is paired with one and only one y value.

For every input there is only one output



Is this relation
a function?

Is this relation a function?



1 is repeated
NOT
 A
 Function.

Is this relation a function?

(6,7) (-4,3) (1, -5) (6,2)

NO

Is this relation a function?

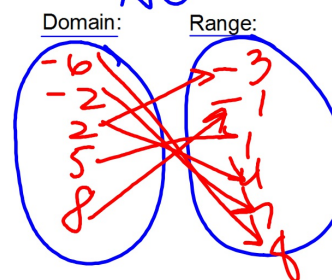
(4,0) (2,1) (-8,1) (9,5)

yes

Using a Mapping Diagram to tell if a relation is a function.

(5,1), (-2, 7), (2, -3), (8, -1), (2, 4), (-6, 8)

NO



If any domain value has more than one line coming from it then the relation is NOT a function

Is the following relation a function?

$(-4, 7), (3, -9), (-8, 2), (5, 7), (2, 4)$

yes

Is the following relation a function?

x	y
8	4
1	-9
-3	2
5	4

yes

Is the following relation a function?

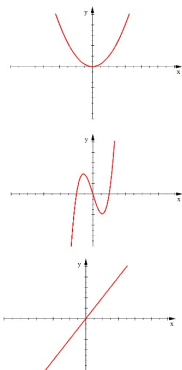
x	y
-9	1
4	0
-2	-7
4	8

No

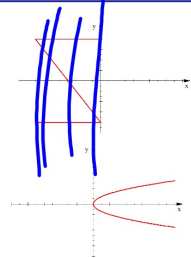
7. How can you tell if a graph represents a function?

passes
the VLT
Vertical
Line
test

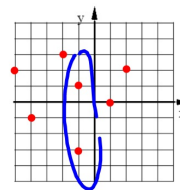
Is a Function



Is NOT a Function



Vertical Line Test: If any vertical line can touch the graph more than once the relation is not a function.



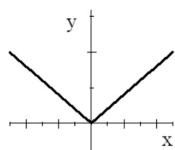
8. Is each of these relations a function?

a)

X	Y
-2	4
3	1
7	-6
4	1

yes

b)



yes

How do you say $f(x)$?

"f of x"

f is the function name

x is the Independent variable (the input)

$f(x)$ doesn't mean f times x

What is another way to write $f(x) = 7x - 8$?

$f(x) =$ is just another way to write $y =$

If $f(x) = -2x + 3$ what does $f(5)$ mean?

Find $f(5)$. $= -7$ evaluate the function f when $x=5$.

$$\begin{aligned} f(5) &= -2(5) + 3 \\ &= -10 + 3 \\ &= -7 \end{aligned}$$

9. If $f(x) = x^2 + 3x$

find the range for this given domain: Domain : $\{-4, 0, 2\}$

Find each of the following:

$$f(-4) = (-4)^2 + 3(-4)$$

$$f(0) = 0$$

$$f(2) = 10$$

Range: $\{4, 0, 10\}$

Given the functions: $g(x) = -10x - 1$

and $k(r) = -2x^2 + 5$

1. Find $g(5)$

$$g(5) = -10(5) - 1 \\ = -51$$

2. Find $k(-3)$

$$k(-3) = 2(-3)^2 + 5 \\ = -13$$

3. Find x if $g(x) = 29$

$$x = -3$$

4. Find $2g(1) + 3k(2)$

$$\begin{array}{r} 29 = -10x - 1 \\ +1 \quad +1 \\ \hline 30 = -10x \end{array}$$

HW #27 - due tomorrow!

Sec. 5-2

Pages: 244-245

Problems: 2, 4, 24, 28-30, 32, 38-41, 44

IXL #10 - K.11 & L.1 due tomorrow at 6pm!