Grab a Week #4 Packet off the front table

Monday 9/9

1. Do the order pairs (2, 4), (-2, 7), (3, 8), (3, 9), and (5,-2) represent a function? Justify

No :(3 has two outputs

2. Do the values in the table represent a function? Justify

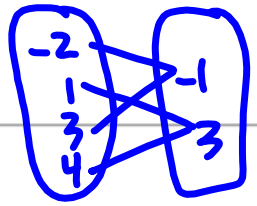
x	0	1	2	3
y	6	0	-6	-12

Yes, each input has EXACTLY 1 output

3. a. Identify the domain and range of the relation { (-2, -1), (1, 3), (3, -1), (4, 3) }.

Domain: {-2, 1, 3, 4} Range: {-1, 3}

b. Represent the relation with a mapping diagram.



c. Is the relation a function?

Yes!

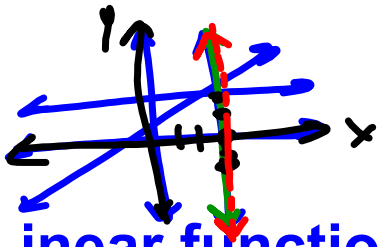
Week #3 packet due tomorrow

Essential Question

How can you determine whether a function is linear or nonlinear?

Function:

Relationship that pairs each input value with EXACTLY one output value (vertical line test for graphs)



$x = 3$

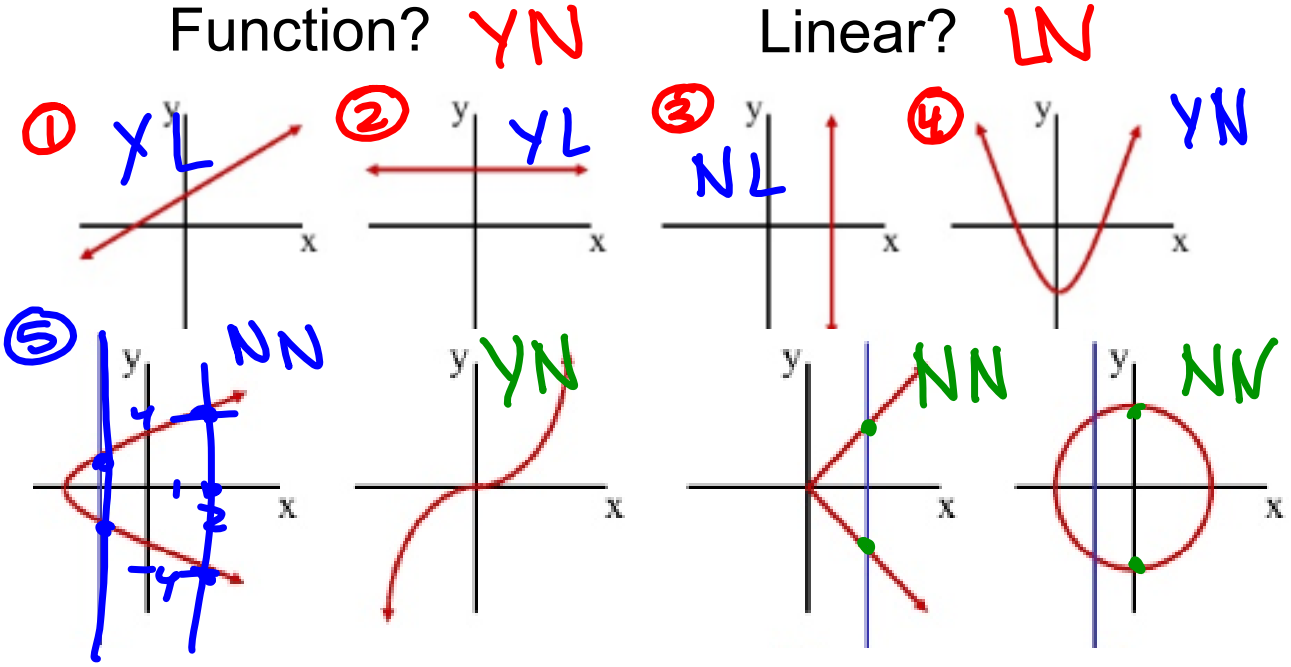
x	y
3	0
3	1
3	2
3	-1

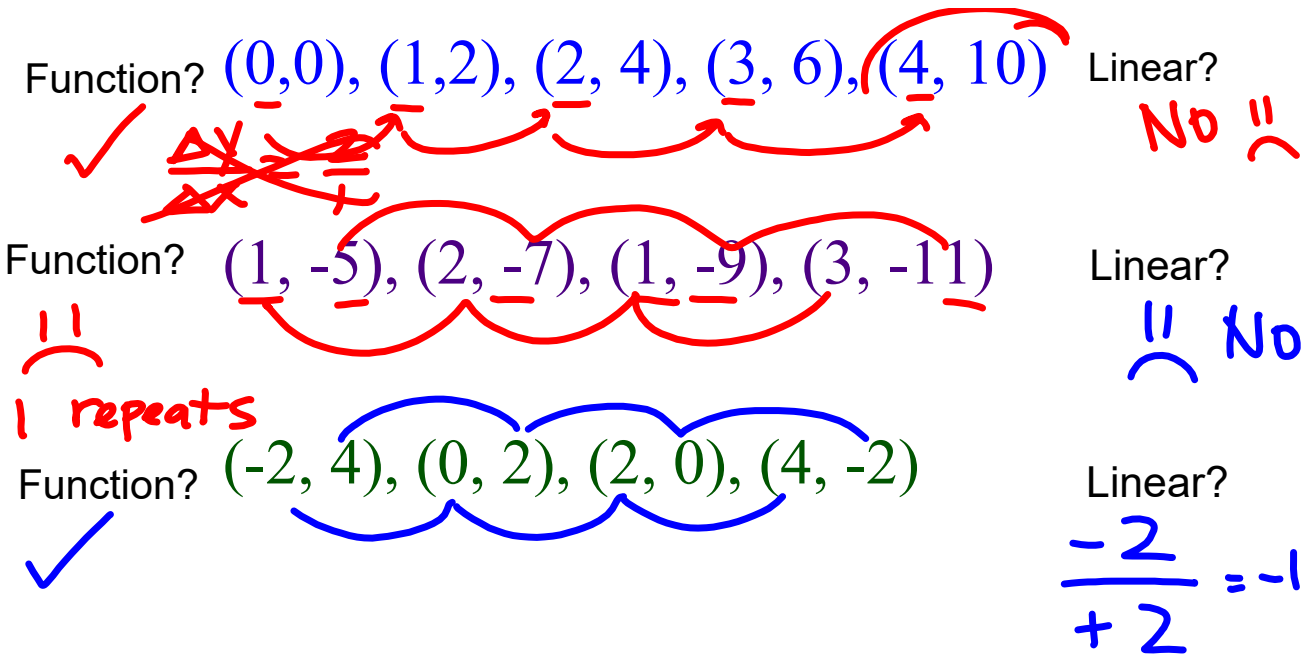
Linear function:

A function whose graph is a nonvertical line

Function? YN

Linear? LN




Function?
(0,0), (1,2), (2, 4), (3, 6), (4, 10)
Linear?
No
Function?
(1, -5), (2, -7), (1, -9), (3, -11)
Linear?
No
1 repeats
Function?
(-2, 4), (0, 2), (2, 0), (4, -2)
Linear?
-2 / +2 = -1

Does the table represent a *linear* or *nonlinear* function? Explain.

Yes!

a.

x	3	6	9	12	+3
y	36	30	24	18	−6

$\frac{\Delta y}{\Delta x} = \frac{-6}{3} = -2$

Yes!

b.

x	1	3	5	7	+2
y	2	9	20	35	

+7 +11 +15

Not

=

Does the graph or table represent a *linear* or *nonlinear* function? Explain.

3.

x	0	1	2	3
y	3	5	7	9

$\frac{1}{2}$

$m = \frac{2}{1}$

4.

x	1	2	3	4
y	16	8	4	2

$\div 1$

Not linear :(

Which of the following equations represent linear functions? Explain.

Linear

$y = 6(x - 1)$

$y = 3.8$

Nonlinear

$x^2 - y = 0$

$y = \sqrt{x}$

$y = \frac{2}{x}$

$y = 3^x$

Does the equation represent a *linear* or *nonlinear* function? Explain.

$y = x + 9$

L

$y = mx + b$

x	y
0	0
1	3/5
2	6/5
3	9/5

$y = \frac{3x}{5}$ L

$y = \frac{3}{5} \cdot \frac{x}{1}$

x	y
0	0
1	3/5
2	6/5
3	9/5

$y = 5 - 2x^2$

$y = \frac{3}{5x} \quad \frac{1}{x}$

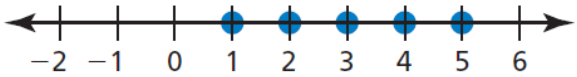
x	y
0	undef.
1	3/5
2	3/16
3	3/15 = 1/5

Core Concept

Discrete and Continuous Domains

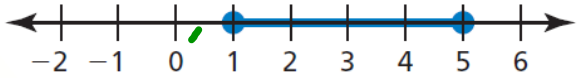
A **discrete domain** is a set of input values that consists of only certain numbers in an interval.

Example: Integers from 1 to 5



A **continuous domain** is a set of input values that consists of all numbers in an interval.

Example: All numbers from 1 to 5



Is the domain discrete or continuous? Explain.

Input Number of stories, x	1	2	3
Output Height of building (feet), y	12	24	36

no ½ stories

The linear function $y = 15x$ represents the cost y (in dollars) of x tickets for a museum. The museum can hold up to 100 people at a time. $\$ = 15 \cdot \text{tix}$

a. Does this situation represent a linear function?

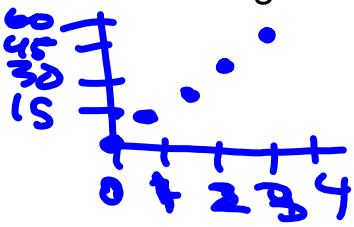
Yes!

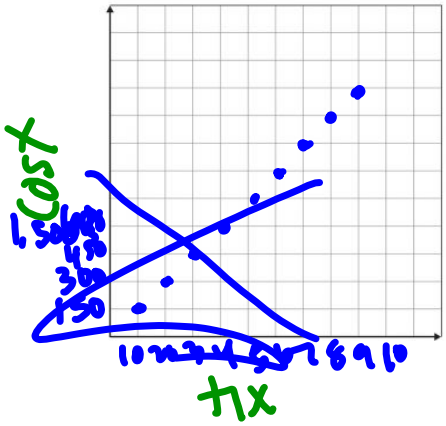
b. Is the domain discrete or continuous?

c. Find the domain of the function. (x)

{0,1,2,3, ... 100} R: {0,15,30, ... 1,500}

d. Graph the function using its domain.





$y = 50 - 9x$

The linear function $m = 50 - 9d$ represents the amount m (in dollars) of money you have after buying d DVDs.

$\$ = 50 - 9\,DVD$

a. Does this situation represent a linear function?

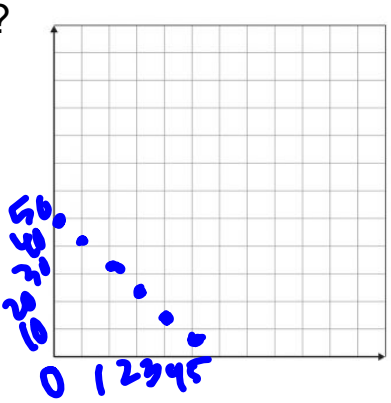
Yes!

b. Is the domain discrete or continuous?

c. Find the domain of the function.

D: {0, 1, 2, 3, 4, 5} R: {50, 41, 32, 23, 14, 5}

d. Graph the function using its domain.



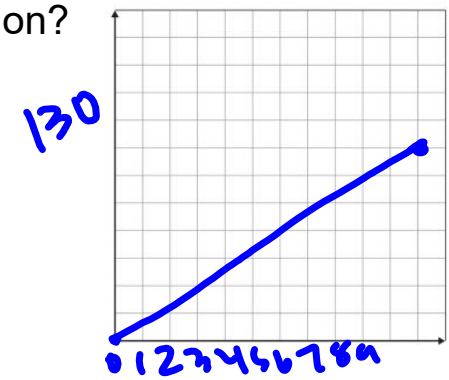
A cereal bar contains 130 calories. The number *c* of calories consumed is a function of the number *b* of bars eaten.

a. Does this situation represent a linear function?

b. Is the domain discrete or continuous?

c. Find the domain of the function.

d. Graph the function using its domain.



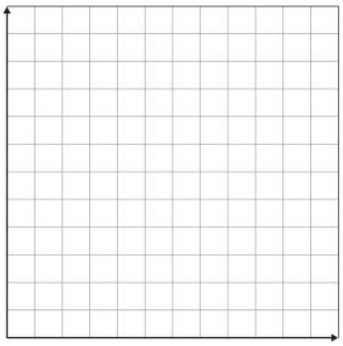
A 20-gallon bathtub is draining at a rate of 2.5 gallons per minute. The number *g* of gallons remaining is a function of the number *m* of minutes.

a. Does this situation represent a linear function?

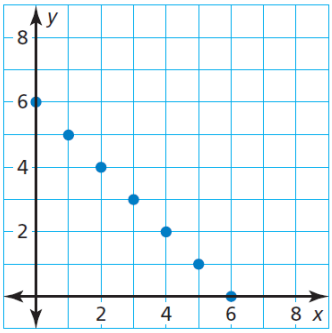
b. Is the domain discrete or continuous?

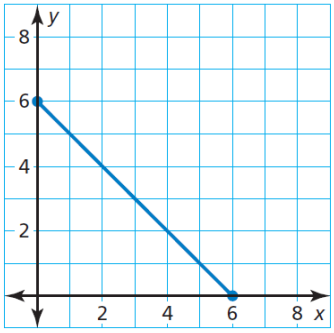
c. Find the domain of the function.

d. Graph the function using its domain.

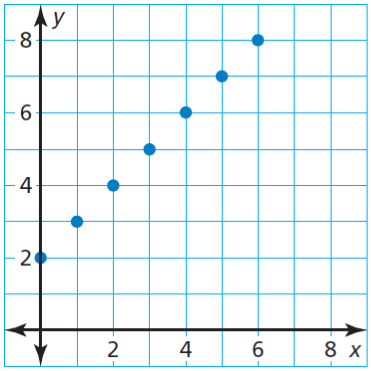


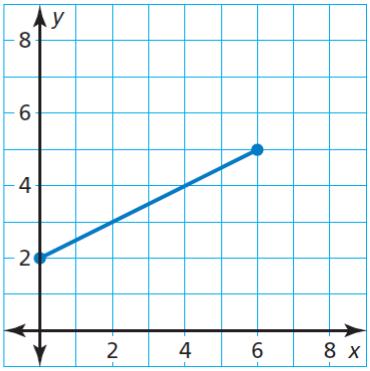
Write a real-life problem to fit the data shown in each graph. Is the domain of each function *discrete* or *continuous*? Explain.





Write a real-life problem to fit the data shown in the graph. Is the domain of the function *discrete* or *continuous*? Explain.





3.2 Linear Functions

pg 117-119 #s 1-4, 15-19 odd, 26, 27-39 odd, 52