

## Standard 10) Recursive Patterns

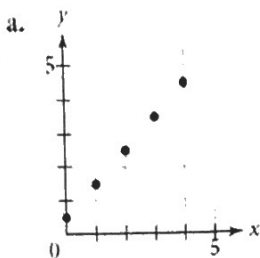
1) Write a NEXT-NOW equation for each sequence. Then use your equation to find the 8<sup>th</sup> term of each sequence.

a) 5.8, 7.0, 8.2, 9.4, ...   
 Next = Now + 1.2  
 Starting at 5.8

b) 2.5, 5, 10, 20, ...

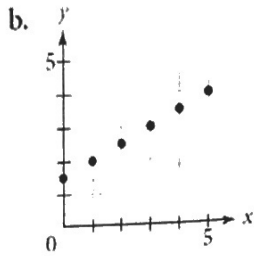
Next = Now × 2  
 Starting at 2.5

2) For each of the graphs below, fill in the table of values and write the NOW-NEXT equation for each relationship.



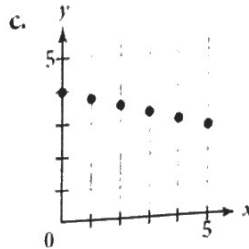
x	y
0	0.5
1	1.5
2	2.5
3	3.5
4	4.5

Next = Now + 1  
 Start @ 0.5



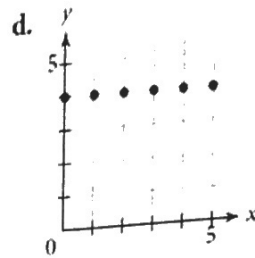
x	y
0	1.5
1	2
2	2.5
3	3
4	3.5
5	4

Next = Now + 0.5  
 Start @ 1.5



x	y
0	4
1	3.75
2	3.5
3	3.25
4	3
5	2.75

Next = Now - 0.25  
 Start @ 4



x	y
0	4
1	4
2	4
3	4
4	4
5	4

Next = Now + 0  
 Start @ 4

3.) Write a NEXT-NOW equation for each sequence of numbers. Then find the 10<sup>th</sup> term of each of the sequences.

a) 3, 9, 15, 21, ... Equation: Next = Now + 6, start @ 3 10<sup>th</sup> term: 57

b) -5, 15, -45, 135, ... Equation: Next = -3 · Now, start @ -5 10<sup>th</sup> term: 98,415

c) 2, 5, 11, 23, ... Equation: Next = 2 · Now + 1, start @ 2 10<sup>th</sup> term: 1535

# Standard 11) Writing explicit equations

For each table, graph, set of points, or pattern, create the explicit equation that connects x to y, or # of blocks to figure:

x	y
0	2
1	0
2	-2
3	-4

2)

x	y
-1	-2
0	4
1	10
2	16

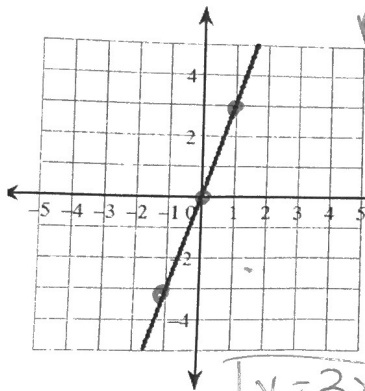
Next = Now + 6

Explicit:  $y = -2x + 2$

Next = Now - 2

Explicit:  $y = 6x + 4$

3)

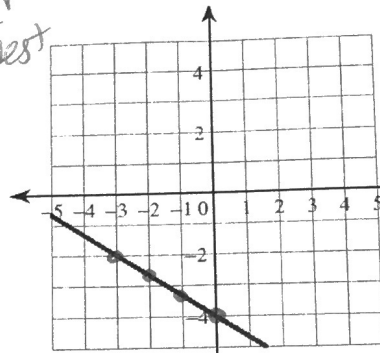


put points in order from least x to greatest

x	y
-1	-3
0	0
1	3

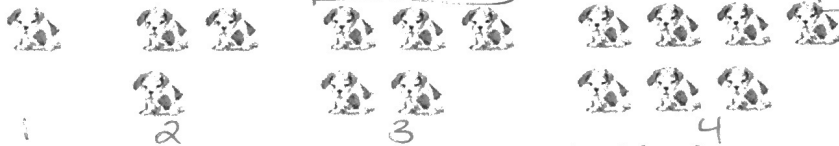
Next = Now + 3

$y = 3x$



x	y
-3	-2
-2	-2.6
-1	-3.33
0	-4

$y = -\frac{2}{3}x - 4$



a.) Describe the 50<sup>th</sup> figure, and how many dogs does it have?

b.) Create the explicit equation (# dogs=).

50 dogs on top row, 49 dogs on bottom row = 99 dogs

6.)

$\# \text{ dogs} = x + (x-1)$



a.) Describe the 50<sup>th</sup> figure, and how many stars does it have?

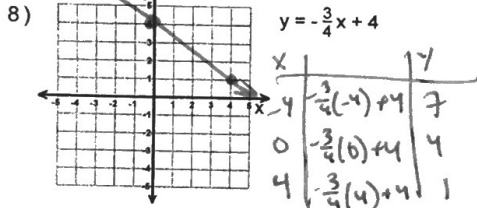
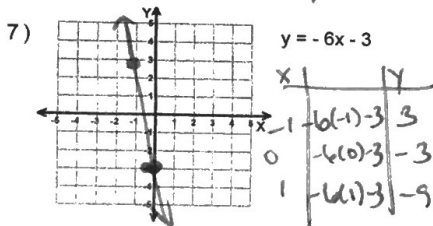
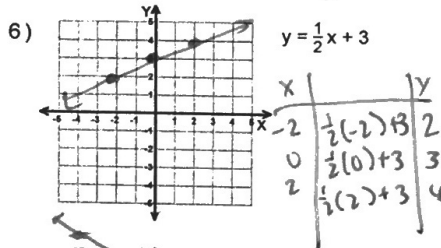
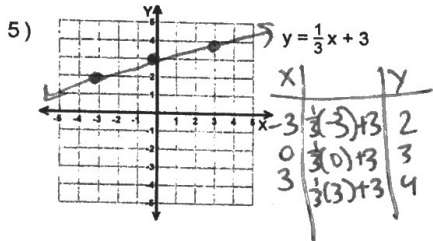
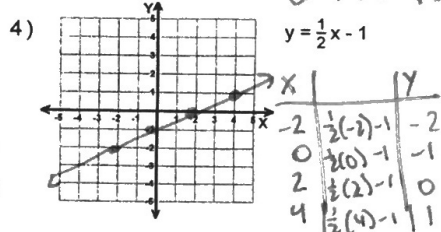
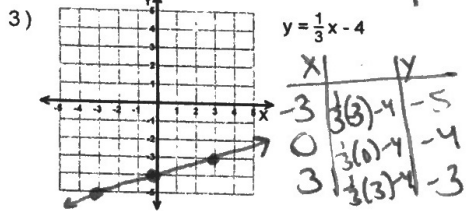
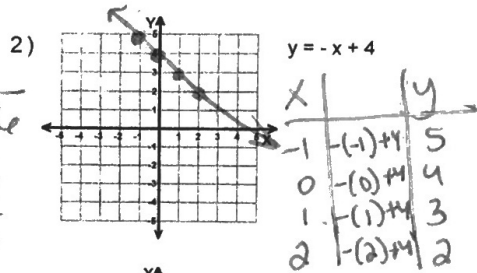
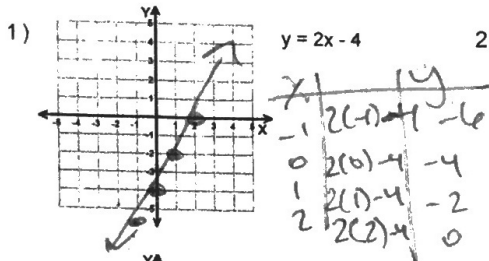
b.) Create the explicit equation (# stars=).

$\# \text{ stars} = 1 + x + x$

1 star in corner, 50 stars on row, 50 stars on column = 101 stars

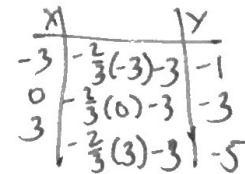
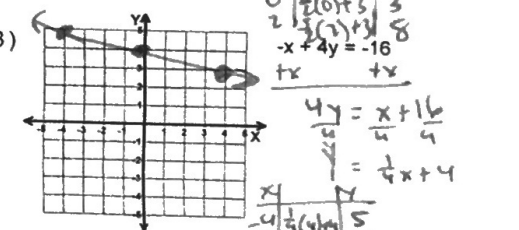
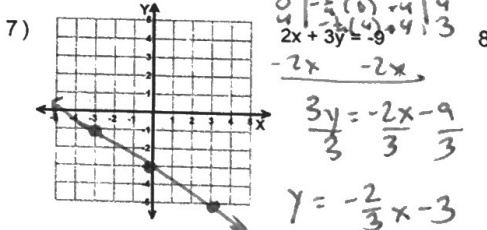
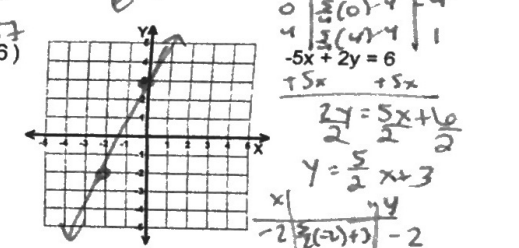
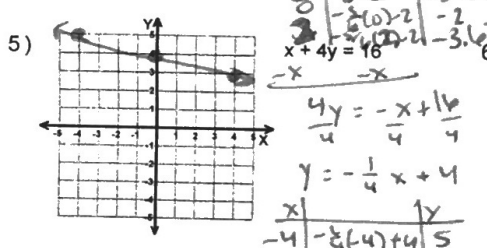
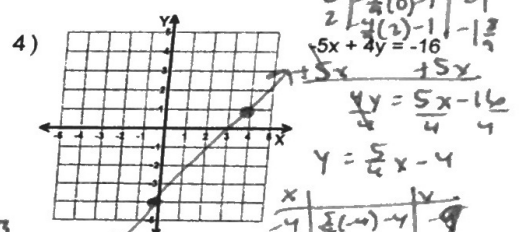
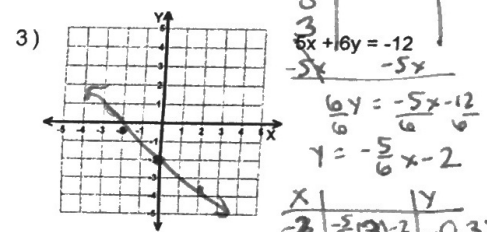
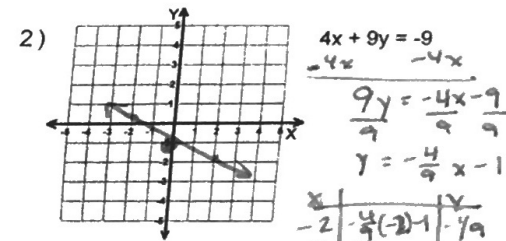
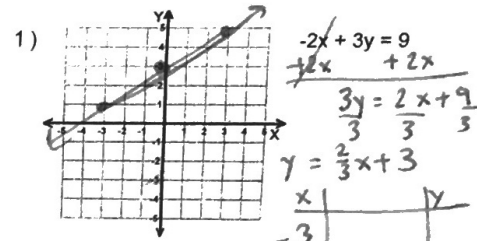
# Standard 12

## Sketch the Graph of Each Line



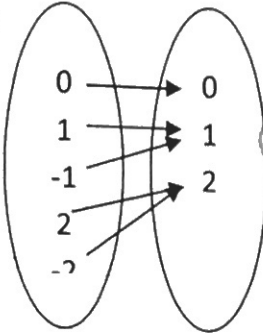
# Standard 12

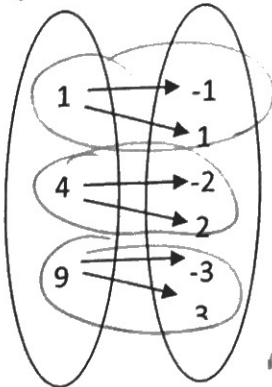
## Sketch the Graph of Each Line



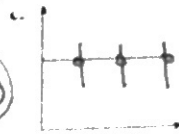
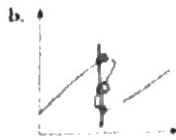
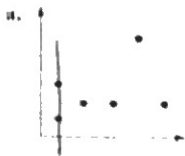
Standard 13) Determine whether a relation is a function and explain why or why not

1) Tell whether or not each relationship is a function. Briefly explain why or why not.

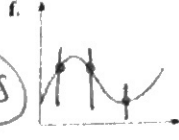
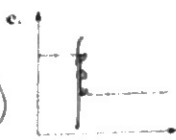
a)  **yes**  
 no x-values  
 is paired  
 with more  
 than one y-value

b)  **no**,  
 several x-values  
 are paired with  
 more than one  
 y-value

2) **no**



**no**



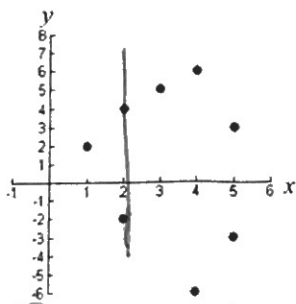
3) a)

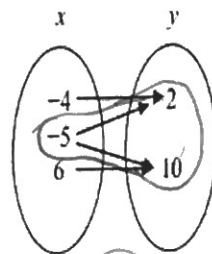
b)

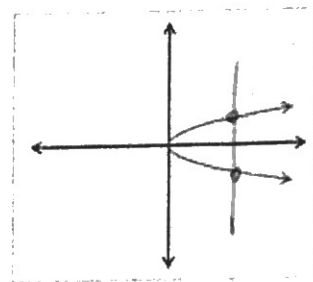
c)

d)

x	y
0	5
1	7
3	10
7	9
5	7
4	5
2	8



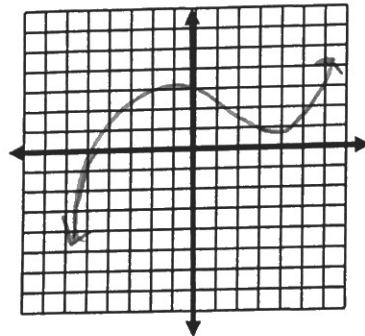
 **no**



**yes** no x-values  
 are paired with  
 more than one y-value


**no** - an x-value is  
 paired with  
 more than one  
 y-value

e) Draw a graph of a relation that is a function.



f) Write a relation of six points that is not a function.

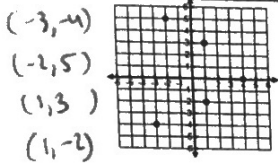
$$\{(3, 4), (3, 5), (1, 0), (2, 4), (5, -1), (8, -2)\}$$

  
 an x-value is paired  
 with more than  
 one y-value

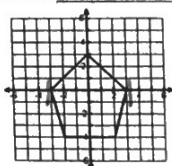
**(Standard 14) Domain & Range**

State the domain and range for each graph and then tell if the graph is a function (write yes or no).

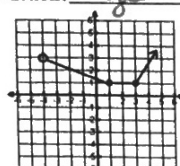
1) Domain  $\{-3, -2, 1\}$   
Range  $\{-4, -2, 3, 5\}$   
Function? no



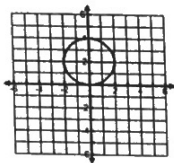
2) Domain  $-2 \leq x \leq 3$   
Range  $-4 \leq y \leq 3$   
Function? no



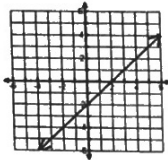
3) Domain  $-4 < x < 7$  or  $x > -4$   
Range  $1 \leq y$  or  $y \geq 1$   
Function? yes



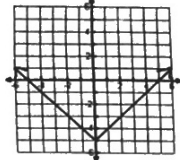
4) Domain  $-2 \leq x \leq 2$   
Range  $0 \leq y \leq 4$   
Function? no



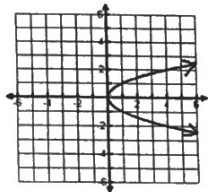
5) Domain all real #s  
Range all real #s  
Function? yes



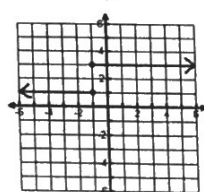
6) Domain all real #s  
Range  $-5 \leq y$  or  $y \geq -5$   
Function? yes



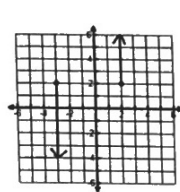
7) Domain  $x \geq 0$   
Range all real #s  
Function? no



8) Domain all real #s  
Range  $\{1, 3\}$   
Function? yes



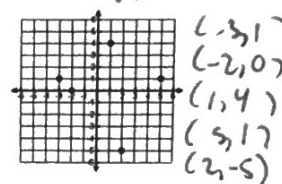
9) Domain  $\{-3, 2\}$   
Range all real #s  
Function? no



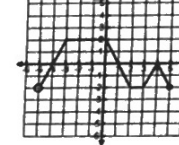
**Domain and Range Practice**

State the domain and range for each graph and then tell if the graph is a function (write yes or no).

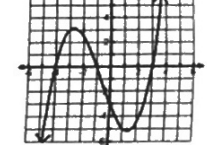
10) Domain  $\{-3, -2, 1, 2, 5\}$   
Range  $\{-5, 0, 1, 4\}$   
Function? yes



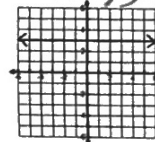
11) Domain  $-5 \leq x \leq 5$   
Range  $-2 \leq y \leq 2$   
Function? yes



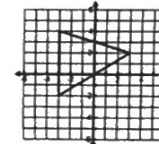
12) Domain all real #s  
Range all real #s  
Function? yes



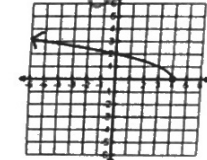
13) Domain all real #s  
Range  $\{3\}$   
Function? yes



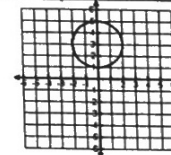
14) Domain  $-3 \leq x \leq 3$   
Range  $-2 \leq y \leq 4$   
Function? no



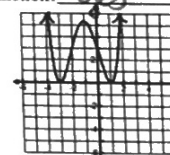
15) Domain  $x \leq 4$   
Range  $0 \leq y$  or  $y \geq 0$   
Function? yes



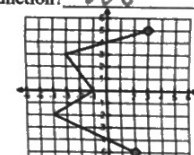
16) Domain  $-2 \leq x \leq 2$   
Range  $1 \leq y \leq 5$   
Function? no



17) Domain all real #s  
Range  $0 \leq y$  or  $y \geq 0$   
Function? yes



18) Domain  $-4 \leq x < 3$   
Range  $-5 \leq y \leq 5$   
Function? no



# Standard 15

## Getting Ready for a Pool Party A Develop Understanding Task



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Sylvia has a small pool full of water that needs to be emptied and cleaned, then refilled for a pool party. During the process of getting the pool ready, Sylvia did all of the following activities, each during a different time interval.

Removed water with a single bucket ① ✓	Filled the pool with a hose (same rate as emptying pool) ⑥
Drained water with a hose (same rate as filling pool) ④	Cleaned the empty pool ⑤
Sylvia and her two friends removed water with three buckets ② ✓	Took a break ③

1. Sketch a possible graph showing the height of the water level in the pool over time. Be sure to include all of activities Sylvia did to prepare the pool for the party. Remember that only one activity happened at a time. Label axes with independent & dependent variables. **Label axes with independent & dependent variables.**



2. Create a story connecting Sylvia's process for emptying, cleaning, and then filling the pool to the graph you have created. Do your best to use appropriate math vocabulary.

3. Does your graph represent a function? Why or why not? Would all graphs created for this situation represent a function?

yes, no x-value is paired with more than one y-value (she does not go back in time)

# Standard 15

## Features of Functions

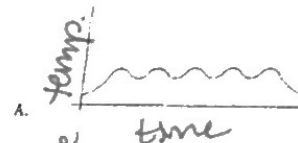
Set

Topic: Describing attributes of a function based on the graphical representation.

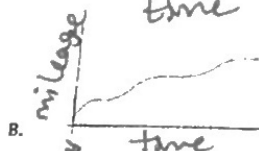
7. For each graph given **match** it to the contextual description that fits best. Then **label** the independent and dependent axis with the proper variables.

Graphs

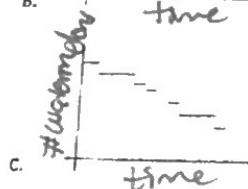
Contextual Descriptions



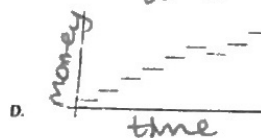
i. The amount of money in a savings account where regular deposits and some withdrawals are made. **D**



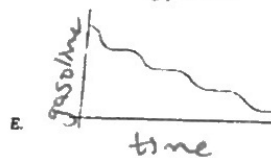
ii. The temperature of the oven on a day that mom bakes several batches of cookies. **A**



iii. The amount of gasoline on hand at the gas station before a tanker truck delivers more. **E**



iv. The number of watermelons available for sale at the farmer's market on Thursday. **C**



v. The amount of mileage recorded on the odometer of a delivery truck over a time period. **B**

Standard 16) Evaluate a function or graph

1.) a) If  $f(x) = -3x + 8$ , find  $f(5)$ .

$$\begin{aligned} & -3(5) + 8 \\ & -15 + 8 \end{aligned} \quad \text{(-7)}$$

b) If  $f(x) = -3x + 8$ , what value(s) of  $x$  makes  $f(x) = 23$

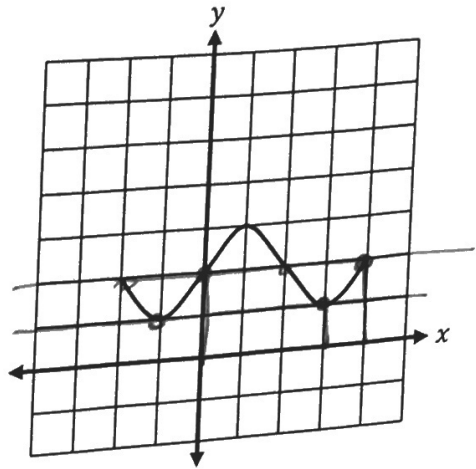
$$\begin{aligned} 23 &= -3x + 8 \\ -8 & \quad -8 \end{aligned} \quad \rightarrow \quad \begin{aligned} 15 &= -3x \\ -3 & \quad -3 \end{aligned}$$

c) If  $h(x) = x^2 - 5$ , find  $h(-7)$ .

$$\begin{aligned} & (-7)^2 - 5 \\ & 49 - 5 \\ & 44 \end{aligned}$$

$$-5 = x$$

d) The graph of  $f(x)$  is on the right. What is  $f(4)$ ?



e) The graph of  $f(x)$  is below. What is  $f(3)$ ?

2

f) The graph of  $f(x)$  is below. What is  $f(0)$ ?

1

g) The graph of  $f(x)$  is on the right. For what value(s) of  $x$  does  $f(x) = 1$ ?

2

$$x = -1 \text{ and } x = 3$$

h) The graph of  $f(x)$  is below. For what value(s) of  $x$  does  $f(x) = 2$ ?

$$x = -2, 0, 2, 4$$

2.)

Find each function value for  $f(x) = 4x - 7$  and  $g(x) = -3x + 5$  without using your calculator.

a.  $f(2) = 1$

b.  $f(0) = -7$

c.  $f(-3) = -19$

d.  $g(1) = 2$

e.  $g(6) = -13$

f.  $g(-7) = 26$

g.  $f(0.5) = -5$

h.  $g(0.5) = 3.5$

3.)

Use the graph of  $y = f(x)$  to answer each question.

a. What is the value of  $f(0)$ ?  $= 2$

b. What is the value of  $f(3)$ ?  $= -2$

c. For what  $x$  value or  $x$ -values does  $f(x)$  equal 3?  $x = 6$

d. For what  $x$  value or  $x$ -values does  $f(x)$  equal 0?  $x = 0, 1.5, 5$

e. For what  $x$  values is  $f(x)$  less than 0?  $x = \text{between } 1.5 \text{ and } 5$

$$D: -3 \leq x \leq 6$$

$$R: -2 \leq y \leq 3$$

