Algebra 1
Test Review

Name _____
Date _____

I. Functions

Given the following relations, state the domain, range and tell whether it is a function or not. Explain.

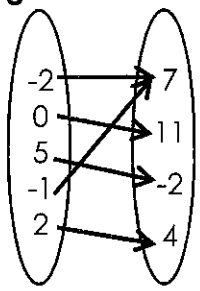
1. { (5, –1), (0 , 3), (–2 , –4), (6 , –1) (–2 , 3) }

Function? _____ Why? _____

Domain: _____

Range: _____

2.



Function? _____

Why? _____

Domain: _____

Range: _____

3. **Evaluate** f(x) = –3x – 2 over the domain {–2, –1, 0, 2}. What is the range?

Given: f(x) = –5x + 7 **g(x) = 2^x + 3**

4. g(3) = _____ 5. f(–3) = _____ 6. g(-2) = _____ 7. f(0) = _____

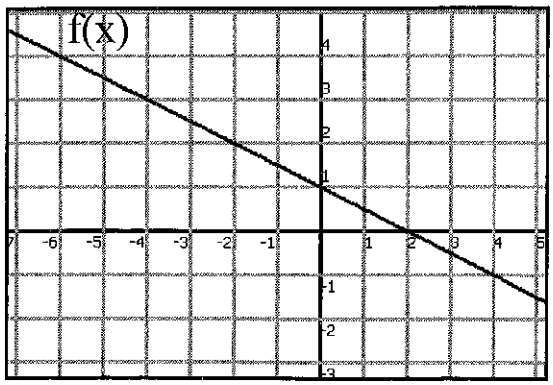
Given: f(x) = 3x – 1 $g(x) = \frac{x+2}{3}$ $h(x) = -x - 2$

8. f(1) + 4 = _____ 9. g(4) – h(-1) = _____ 10. g(7) + 3f(-2) = _____ 11. 2h(3) – 5 = _____

Given k(x) = { (-5, -10), (-3, 0), (0, 1), (2, 5), (6, 9), (10, 13), (13, 17)}

12. k(2) = _____ 13. k(0) = _____ 14. k(-3) = _____ 15. k(13) = _____

Given the graph to the right, evaluate the following:



16. f(-6) = _____

17. f(-3) = _____

18. f(2) = _____

#19 – 22: Given f(x) = -5x + 7 and g(x) = $\frac{3x+4}{2}$

19. f(-2) = _____

20. If f(x) = -8, determine the value of x. f(___) = -8.

21. g(4) = _____

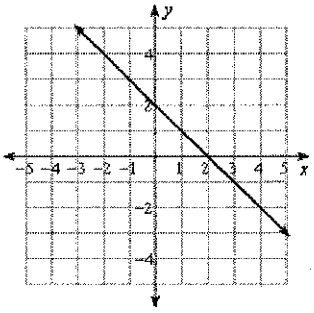
22. If g(x) = -1, determine the value of x. g(___) = -1.

#23 – 30: Given: $f(x) = -2x + 5$ $g(x) = \frac{x-6}{2}$ $h(x) = 3x^2 - x + 1$ $j(x) = \frac{x}{3} - 5$

23. h(-1) = _____ 24. j(x) = -2, x = _____ 25. g(10) = _____ 26. f(x) = -7, x = _____

27. g(x) = -1, x = _____ 28. j(12) = _____ 29. f(½) = _____ 30. j(x) = -3, x = _____

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



31. f(2) = _____ 32. f(x) = -2, x = _____ 33. f(-3) = _____

34. f(0) = _____ 35. f(x) = 0, x = _____ 36. f(x) = 5, x = _____

#26 – 28: Marcus currently owns 200 songs in his iTunes collection. Every month, he plans to add 15 new songs. Write a function f(x) to model this scenario, and use the function to answer the questions.

26. Function: f(x) = _____

27. Evaluate f(9). Explain its meaning in the context of the problem.

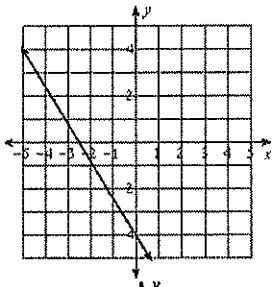
28. Determine when f(x) = 425. Explain its meaning in the context of the problem.

II. Slope

Find the slope of the following points, equations, tables, and graphs.

1. (10, -1) & (-2, 6) **m = _____**

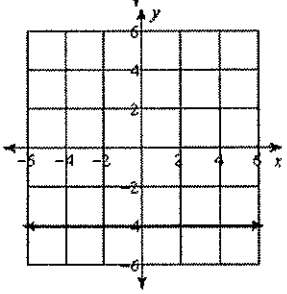
2. $4x + 6y = 10$ **m = _____**

3.  **m = _____**

4.

x	y
-4	1
-2	4
0	7
2	10
4	13

m = _____

5.  **m = _____**

6.

x	y
12	-1
10	-2
8	-3
6	-4
4	-5

m = _____

III. Arithmetic Sequences

Find the next three terms of the arithmetic sequence.

1. $14, 7, 0, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \ldots$

2. $-13, -5, 3, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \ldots$

3. Use the table to write a recursive formula for the sequence. _____

Term Number (n)	1	2	3	4
Value (a_n)	17	23	29	35

4. Given the following recursive formula, fill in the table.

$a_1 = 6$; $a_n = a_{n-1} - 4$

Term Number (n)	1	2	3	4	5	6
Value (a_n)						

5. Given the following recursive formula, find the next terms.

$a_1 = 2$; $a_n = a_{n-1} - 12$ $a_2 =$ _____ $a_6 =$ _____ $a_9 =$ _____

6. Given the following explicit formula, find the next terms.

$a_n = 4 - 9(n - 1)$ $a_2 =$ _____ $a_6 =$ _____ $a_9 =$ _____

7. Given the following explicit formula, fill in the table.

$a_n = 11 + 3(n - 1)$

Term Number (n)	1	2	3	4	5	6
Value (a_n)						

Fill in the blanks and write the explicit formula.

8. 16, 3, -10, ... a_1 = _____ d = _____ _____

9. 6, 15, 24, ... a_1 = _____ d = _____ _____

Write the explicit formula and find the terms.

10. 8, 11, 14, ... _____ a_{34} = _____ a_{105} = _____

11. -1, -8, -15, ... _____ a_{100} = _____ a_{157} = _____

12. Kerpippy has $15 in her piggy bank. She decides to add $2 each week.

a) Write the first four terms of the arithmetic sequence. (Hint: Term 1 is after week 1.)

b) Write the explicit formula for the arithmetic sequence.

c) Her goal is to buy Barbie a tank for $49 in 20 weeks. Will she have enough money by then?

Given the following recursive formulas, write the *explicit* formula

13. $a_1 = -10$; $a_n = a_{n-1} + 5$ _____

Find the next three terms. Name the term a_1. State whether the sequence is arithmetic or not. If it is arithmetic, find the common difference.

14. 1, 4, 7, 10, _____, _____, _____ a_1 = _____ arithmetic? _____ d = _____

15. 3, 6, 12, 24, _____, _____, _____ a_1 = _____ arithmetic? _____ d = _____

16. Write the INFINITE arithmetic sequence that is defined recursively here: $a_1 = 10$, $a_n = a_{n-1} - 6$.

17. Given the arithmetic sequence, write a simplified explicit formula. Then, use your formula to find the terms.

18, 25, 32, 39, ... a_n = _____ a_{10} = _____ a_{25} = _____

IV. Graph Characteristics – Matching. Choose the graph that has the characteristic given below.

_____ 1. Domain: $(-\infty, 4]$

_____ 2. Y-int: (0, 0)

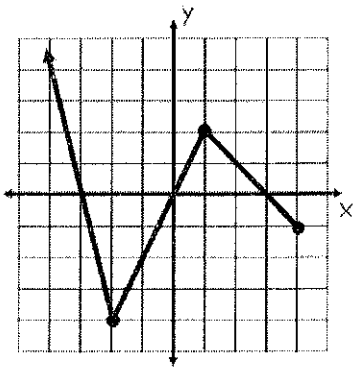
_____ 3. Increasing Interval: (-3, 1)

_____ 4. Range: $[-3, 3]$

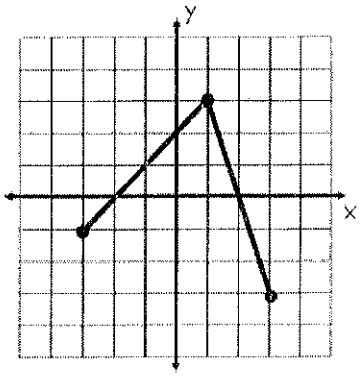
_____ 5. left end behavior as $x \rightarrow -\infty$, $y \rightarrow \infty$

_____ 6. Has a rate of change of 2

A.

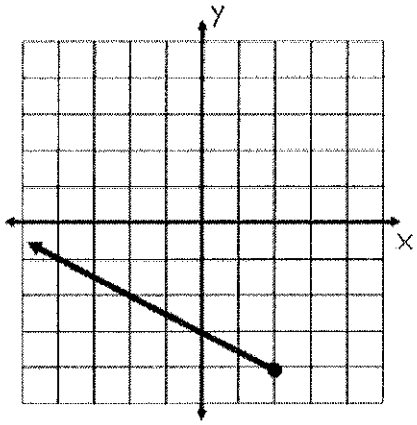


B.



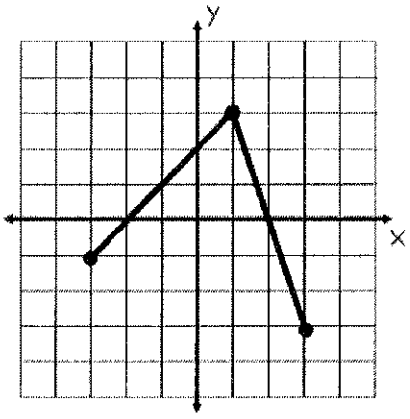
Fill in the table of characteristics for the graph shown.

7.



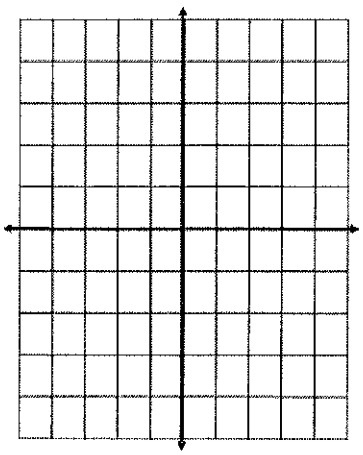
Characteristic	Answer
Rate of Change	
Domain	
Range	
Increasing Interval	
Decreasing Interval	
x-intercept	
y-intercept	
Left End Behavior	
Right End Behavior	

8.



Characteristic	Answer
Rate of Change	
Domain	
Range	
Increasing Interval	
Decreasing Interval	
x-intercept	
y-intercept	
Left End Behavior	
Right End Behavior	

9. Given some characteristics, sketch the **line** and then fill in the rest of the characteristics.



f(x) = _____

*rate of change: **-1/2**

domain: _____

range: _____

end behavior: left **As x → -∞, y →** _____

right **As x → ∞, y →** _____

x-intercept: _____

*y-intercept: **(0, 1)**

III. Linear Functions

EXTRA PRACTICE

*** Remember that all linear functions have a constant rate of change.*

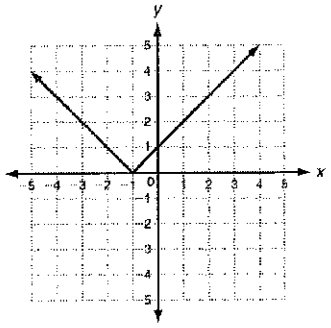
Function notation

1. Determine if the following is a relation or a function.

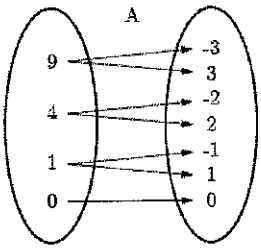
a.

x	0	1	2	3	4
y	8	11	14	14	20

b.



c.



2. Rewrite the equation as a function.

$y = 5x - 2$

3. Write the coordinate point that this corresponds to.

$f(8) = 0$

Continuous/Discrete

4. Determine if the relations/functions from problem #1 are discrete or continuous.

a. b. c.

Domain/Range and Input/output

5. Identify the domain and range.

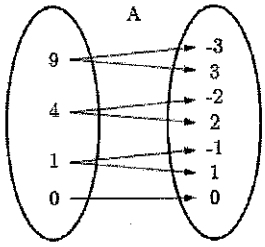
a.

x	0	1	2	3	4
y	8	11	14	17	20

DOMAIN:

RANGE:

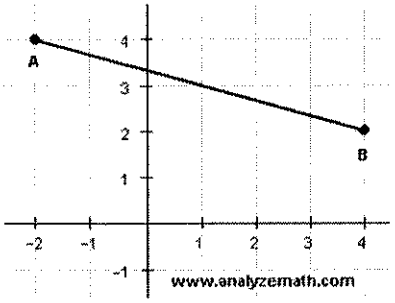
b.



DOMAIN:

RANGE

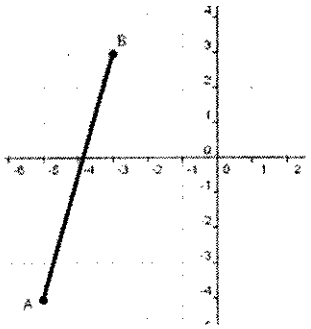
c.



DOMAIN:

RANGE:

d.



DOMAIN:

RANGE:

EXTRA PRACTICE

Evaluation functions

6. $h(x) = x^2 - x + 1$ $\quad g(x) = 3x - 6$

a. h(-7)= b. g(0)= c. find x, if g(x) = 12

7.

x	0	1	2	3	4
f(x)	8	3	0	17	1

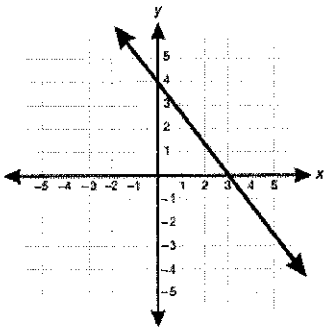
a. f (1) = b. find x, if f(x) = 0

Finding slope- graph, table, 2 points, function

8. Find the slope over the interval [2, 3]

x	0	1	2	3	4
f(x)	8	3	0	17	1

9. Find the slope over the interval [0, 3]



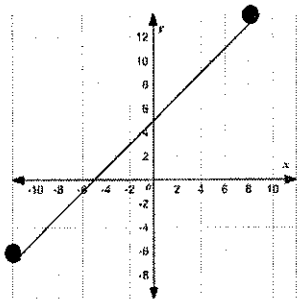
10. Find the slope over the interval [0, 5] of the function f(x) = 3x + 1

11. Find the slope between the two points (10, 20) and (-4, 5)

EXTRA PRACTICE

Characteristics of linear functions

12.



Domain:

Range:

x-intercept:

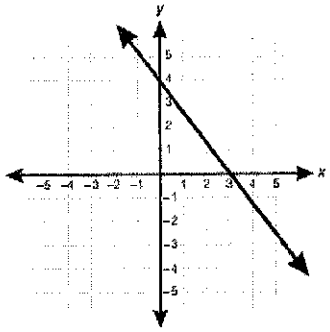
y-intercept:

increasing/decreasing:

end behavior: as x → , y →

as x → , y →

13.



Domain:

Range:

x-intercept:

y-intercept:

increasing/decreasing:

end behavior: as x → ∞, y →

as x → - ∞, y →

Arithmetic sequences

***Remember that an arithmetic sequence has a constant different between consecutive terms*

14. Is this an arithmetic sequence? If so, name the common difference, d.

a. 2, 3, 5, 8, 12, 17....

b. 4, 0, -4, -8, -12, ...

15. a. Write the explicit formula to give the nth term:

4, 0, -4, -8, -12, ...

a_n =

b. What is the 122nd term of this sequence?

16. All arithmetic sequences represent a _____ function.