

Name Key

Date \_\_\_\_\_

For this part of the review, make sure you can do the work without using a calculator.

1. If you are given an explicit notation, convert it to recursive. If you are given a recursive notation, convert it to explicit. **Show your work.**

a)  $a_n = a_{n-1} + 6; a_1 = -8$

$a_n = a_1 + d(n-1)$

$a_n = -8 + 6(n-1)$

$a_n = -8 + 6n - 6$

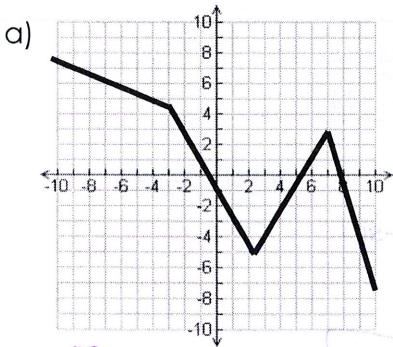
$a_n = 6n - 14$

b)  $a_n = 3n - 12$

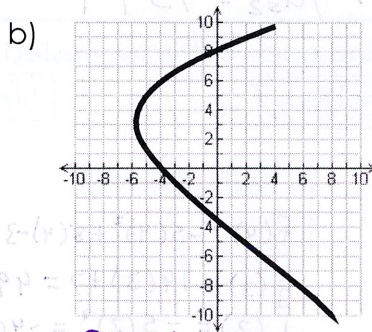
$a_1 = 3(1) - 12 = 3 - 12 = -9$

$a_n = a_{n-1} + 3; a_1 = -9$

2. Determine whether each of the following is a function or a relation.



Function. It passes the vertical line test.



Relation. It fails the vertical line test.

c)  $\{(3, 4), (7, 8), (18, -7), (-4, 6), (6, -7), (-9, 3)\}$

Function. None of the x's repeat.

d)  $\{(5, -2), (5, -5), (5, 8), (5, 7), (5, 9), (5, -13)\}$

Relation. The 5 repeats for x, but its y does not repeat with it.

3. Given  $f(x) = 2x^2 + 9x^3 - 8x^6$  find:

a. standard form  $-8x^6 + 9x^3 + 2x^2$

b. degree 6

c. leading coefficient -8

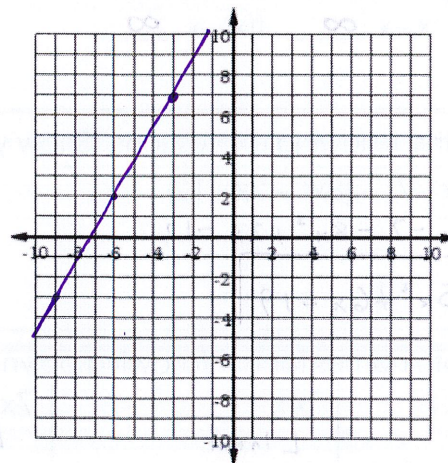
d. constant None/0

e. name by number of terms Trinomial

4. Graph the following equation:  $5x - 3y = -36$

$$\begin{array}{r} 5x - 3y = -36 \\ -5x \qquad -5x \\ \hline -3y = -5x - 36 \\ \frac{-3y}{-3} = \frac{-5x - 36}{-3} \\ y = \frac{5}{3}x + 12 \end{array}$$

x	y
0	12
-3	7





You can use a calculator for the rest of the review.

5. Find the explicit formula and the 87<sup>th</sup> term for the following sequence: 14.9, 8.6, 2.3, ...

$$a_n = a_1 + d(n-1) \quad a_n = 14.9 - 6.3n + 6.3 \quad a_{87} = -6.3(87) + 21.2$$

$$a_n = 14.9 + (-6.3)(n-1) \quad \boxed{a_n = -6.3n + 21.2} \quad \boxed{a_{87} = -526.9}$$

6. Dale has opened 142 new accounts as of week one. Starting with week two, he opens 12 new accounts each week. Write an explicit formula and a recursive formula for the situation, and find how many accounts he opened in week 52.

$$a_n = a_1 + d(n-1) \quad a_n = 142 + 12n - 12 \quad \boxed{a_n = a_{n-1} + 12; a_1 = 142}$$

$$a_n = 142 + 12(n-1) \quad \boxed{a_n = 12n + 130} \quad a_{52} = 12(52) + 130$$

$$\boxed{a_{52} = 754}$$

7. Use the function definitions shown below to find each of the requested values.

$$\boxed{f(x) = -5x^2 + 8x - 3} \quad \boxed{g(x) = 14x + 7} \quad \boxed{h(x) = -5x^3}$$

$h(x) \cdot f(x)$	$g(2x-5)$	$f(4) + g(3) + h(2)$	$4f(x) - 2g(x)$
$(-5x^3)(-5x^2 + 8x - 3)$	$14(2x-5) + 7$	$f(4) = -5(4)^2 + 8(4) - 3 = -51$	
$\boxed{25x^5 - 40x^4 + 15x^3}$	$28x - 70 + 7$	$g(3) = 14(3) + 7 = 49$	
	$\boxed{28x - 63}$	$h(2) = -5(2)^3 = -40$	
		$-51 + 49 + (-40) = \boxed{-42}$	

8. Write the equation  $y = \frac{3}{4}x + 3$

Domain  $(-\infty, \infty)$  Range  $(-\infty, \infty)$

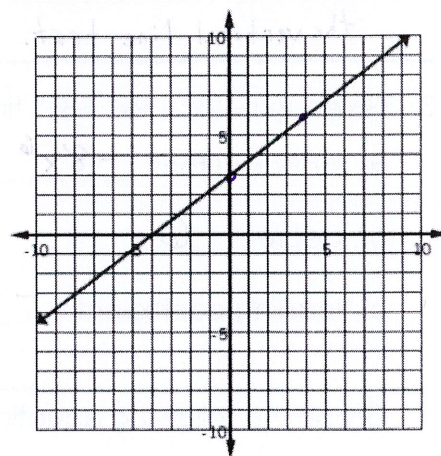
x-intercept  $(-4, 0)$  y-intercept  $(0, 3) \rightarrow f(0) = 3$  (in function notation)

Interval of Increase  $(-\infty, \infty)$  Decrease  $\emptyset$

Find  $f(4) = 6$  Rate of change over  $[-8, 4]$   $\frac{3}{4}$

End behavior  $x \rightarrow -\infty \quad f(x) \rightarrow -\infty$   
 $x \rightarrow \infty \quad f(x) \rightarrow \infty$

$$\frac{6 - (-3)}{4 - (-8)} = \frac{9}{12} = \frac{3}{4}$$



9. Simplify the following expressions. Show your work and put your answers in standard form

a.  $(3x^2 + 4x - 7) - (8x^2 - 2x + 12)$

$$3x^2 + 4x - 7 - 8x^2 + 2x - 12$$

$$\boxed{-5x^2 + 6x - 19}$$

b.  $3(-x^2 + 3x - 2) - 2(5x^2 - 2x + 11)$

$$-3x^2 + 9x - 6 - 10x^2 + 4x - 22$$

$$\boxed{-13x^2 + 13x - 28}$$

10. Give both names for the following polynomials.

$9x^2 - 5x + 11$ Quadratic Trinomial	$14x + 7$ Linear Binomial	$7x$ Linear Monomial	$4x - 5x^3 + 1 - x^2$ Cubic Polynomial	$148$ Constant Monomial
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