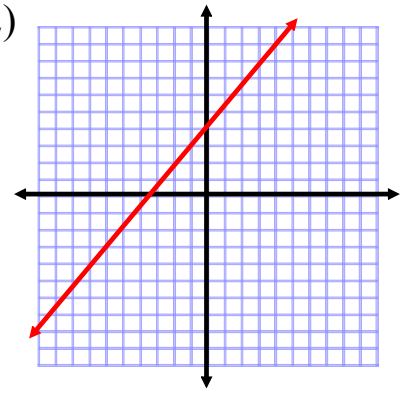
Warm-Up:

Find the domain and range of each relation. Then determine whether the relation is a function and state whether it is discrete or continuous.

1) {(-5, 1), (-5, 2), (1, 3)}

D: {-5, 1}
R: {1, 2, 3}
No

2)



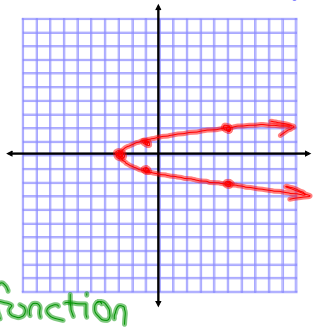
D: All Real #s
R: All Real #s
Yes, Continuous

36, 34, 38

34) $x = 2y^2 - 3$

x	y
-3	0
-1	1
5	2
-1	-1
5	-2

D: $x \geq -3$ R: All Real #s



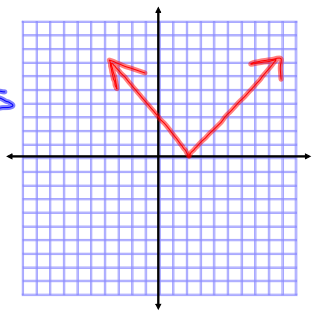
Not a function

36) $g(x) = x^2 - x$

$g(3) = 3^2 - 3$

$g(3) = 6$

18)



D: All Real #s
R: $y \geq 0$
Yes

Section 2-2: Linear Equations

Linear:	Not Linear:
$3x - y = 12$	$y = x^2$
$18y = 14x + 4$	$xy = 12$
$y = 3x - 9$	$y^3 = 8x + 9$
$y = 2(x + 4)$	$x = \frac{1}{y} + 9$

What is the difference between a linear equation, and a non-linear equation?

A linear equation contains only addition, subtraction and multiplication by a variable with a constant.

Variables can not be multiplied together, be in a denominator, or contain exponents other than one.

The graph of a linear equation is a line.

A linear function gives a relation in which the ordered pairs satisfy a linear equation.

A linear function can be written:

$f(x) = mx + b$, where m and b are real numbers.

Examples:
State whether each is a linear function.

1) $g(x) = 2x - 5$

linear

2) $p(x) = x^3 + 2$

non-linear

3) $t(x) = 4 + 7x$

linear

Examples:

4) The linear function $f(C) = 1.8C + 32$ can be used to find the number of degrees Fahrenheit $f(C)$ that are equivalent to a given number of degrees Celsius C.

a) On the Celsius scale, normal body temperature is 37^{O} C. What is it in Fahrenheit?

$f(37) = 1.8(37) + 32$

$f(37) = 98.6°F$

b) There are 100 Celsius degrees between the freezing and boiling points of water and 180 Fahrenheit degrees between these two points. How many Fahrenheit degrees equal one Celsius degree?

$$\frac{180}{100}\frac{F}{C} = 1.8°F/°C$$

Standard form for a linear equation is $Ax + By = C$, where A, B, and C are integers whose greatest common factor is 1, $A \geq 0$, and both A and B are not equal to zero.

Examples:

Write each equation in standard form. Identify A, B, and C.

5) $y = 3x - 9$

$-3x + y = -9$

$3x - y = 9$

$A = 3$

$B = -1$

$C = 9$

6) $\frac{-2}{3}x = 2y - 1$

$-3\left(\frac{-2}{3}x - 2y = -1\right)$

$2x + 6y = 3$

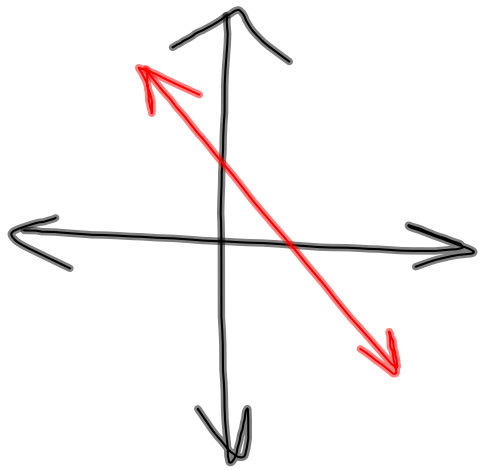
$A = 2$

$B = 6$

$C = 3$

The y-coordinate where a graph crosses the y-axis is the y-intercept. $x = 0$

The x-coordinate where a graph crosses the x-axis is the x-intercept. $y = 0$



Examples:

6) Find the x-intercept and y-intercept of the graph of -2x + y - 4 = 0. Then graph.

y-intercept:

$-2(0) + y - 4 = 0$

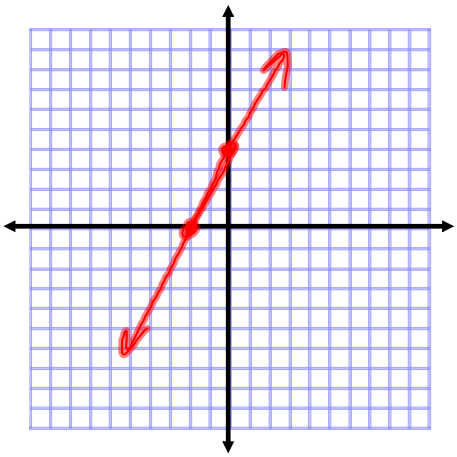
$y = 4$ $(0, 4)$

x-intercept:

$-2x + 0 - 4 = 0$

$-2x = 4$

$x = -2$ $(-2, 0)$



Homework: pg. 69-70 #10-24 all, 28-33 all, 50-52 all, 59, 60