Real Life examples of Functions and Nonfunctions:

You look up a word in the dictionary to get a definition:

Input (domain): A word
Output (range): Definition

This is NOT a function

A policman looks up a license plate number to find who it is registered to:

Input (domain): License plate number
Output (range): Who the car is registered to

This IS a function

Real Life examples of Functions and Nonfunctions:

The IRS looks up a Social Security Number to find out who the tax return if for:

Input (domain): Social Security Number
Output (range): Taxpayers Name

This IS a function

You look up a friend's name in your address book to find a number you can call them at:

Input (domain): Friend's name
Output (range): Phone number

This is NOT a function

Y-Intercept of a graph: Point where a graph crosses or touches the y-axis. Point where x = 0.

To find a y-intercept you replace x with zero and simplify.

X-Intercept of a graph: Point where a graph crosses or touches the x-axis. Point where y = 0.

To find an x-intercept you replace y with zero and solve for x.

Find the x and y-intercepts for the graph of each equation.

1. $4x - 6y = 30$

x-int: $\frac{30}{4} = 7.5$

y-int: $\frac{30}{-6} = -5$

2. $y = x^2 - 6x + 5$

x-int:

$0 = x^2 - 6x + 5$

$-5 \cdot -1 = 5$, $-5 + -1 = -6$

$0 = (x-1)(x-5)$

$x = 1, 5$

y-int: 5

Section 2-2: Linear Equations

Write the equation of the line that passes through this pair of points:

(-4, 12) and (2, 3)

1st you find Slope: $\frac{y_2-y_1}{x_2-x_1}=\frac{12-3}{-4-2}=\frac{9}{-6}$, $m=-\frac{3}{2}$

Point-Slope Form:

$y - y_1 = m(x - x_1)$

$y-12=-\frac{3}{2}(x+4)$

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

Both equations are acceptable.

Slope-Intercept Form:

$y = mx + b$

$y=-\frac{3}{2}x+b$

use (2,3) $3=-\frac{3}{2}(2)+b$

$3=-3+b$

$6=b$

$y=-\frac{3}{2}x+b$

You could take either Point-Slope equation and simplify them and you would get this Slope-Intercept equation.

Write the equation of the line that passes through this pair of points:

(6, -10) and (15, -25)

$m=\frac{-10--25}{6-15}=\frac{15}{-9}=-\frac{5}{3}$

$y--10=-\frac{5}{3}(x-6)$

$y+10=-\frac{5}{3}x+10$ (−10 −10)

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

Because this line passes through the origin it has a special name:

Direct Variation

y-int = 0 so this is a line that passes through the origin.

Equations of Horizontal and Vertical lines:

Because the slope of a Horizontal Line = 0

y = mx + b becomes $y = b$

b is not only the y-intercept it is the y-coordinate of any point on the line.

Because the slope of a Vertical Line is Undefined it's equation can't be written in Slope-Intercept Form

Vertical Line Eq: $x = \#$

this is the x-intercept or the x-coordinate of any point on the line.

Write the equation of the line that passes through this pair of points:

(3, 10) and (-4, 10)

$y = 10$

Just noticing that the two points have the same y-coordinate will lead to this equation.

Write the equation of the line that passes through this pair of points:

(2, -7) and (2, 8)

$x = 2$

Just noticing that the two points have the same x-coordinate will lead to this equation.

Equations for lines:

Point-Slope Form:

$y - y_1 = m(x - x_1)$

Slope-Intercept Form:

$y = mx + b$

Standard Form:

$Ax + By = C$

Horizontal Line:

$y = b$

Vertical Line:

$x = \#$

Parallel and Perpendicular Lines:

Parallel Lines:

Two lines are parallel if:
they never intersect

Equations of Parallel Lines:

Two equations represent Parallel Lines if:

- They have the SAME slope
- But, different y-intercepts

Perpendicular Lines:

Two lines are perpendicular if: they intersect and form a right angle.

Equations of Perpendicular Lines:

Two equations represent Perpendicular Lines if:

- They have the Opposite Reciprocal slopes
- Y-intercept----DOESN'T MATTER

Given this line: y = 4x - 9

1. Write the equation of the line that is Parallel to this line and passes through the point (-5,3).

$y - 3 = 4(x + 5)$

Same slope $m = 4$

2. Write the equation of the line that is Perpendicular to this line and passes through the point (12,-1).

$m = -\frac{1}{4}$

$y + 1 = -\frac{1}{4}(x - 12)$

You could write both of these equations in Slope-Intercept Form but if no form is stated then Point-Slope Form is okay.

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Problems 28, 29, 33, 36-41, 60

Due Tomorrow

Don't graph the lines for 38-41