Friday - 10-minute quiz on pg 4, pg 2 type questions for 15 test points.

(6) Let x = the # of hours it takes them to finish if they work together.

Then $\frac{1}{5}x + \frac{1}{6}x = 1$ ↳ 1 job done.

$\left(\frac{\frac{1}{5}\text{ of a job done}}{1\ \cancel{\text{hour}}}\right)\left(x\ \cancel{\text{hours}}\right) =$ how much of job is done by Sue

$\frac{1}{5} + \frac{1}{6} = \frac{1}{x}$ Equation for what gets done in one hour.

7

What's the price after tax of a book costing $30 if the tax rate is 5%?

x = cost of book + tax on book

= 30 + (.05)(30) $\quad \frac{5}{100} \cdot 30 = 1.5$

= 30 + 1.5

= $31.50

Now, what if you're GIVEN the price AFTER Tax and need to find pre-tax price?

x = cost of book before tax. (Different)

After tax cost = cost of book before tax + tax on book.

$31.50 = x + .05x

31.50 = 1.05x

$\frac{31.50}{1.05} = x = \$30$

Section 3.2 Introduction to Functions

A RELATION is a set of ordered pairs. $\{(2,1), (2,5), (-3,2), (4,6)\}$

The DOMAIN of the relation is the set of all first components of the ordered pairs. The RANGE of the relation is the set of all second components of the ordered pairs.

Domain $= \{2, -3, 4\}$

Range $= \{1, 5, 2, 6\}$

A set of ordered pairs can also be represented by a graph of points.

A FUNCTION is a relation in which each first component in the ordered pairs corresponds to *exactly* one second component.

No x-value is paired with more than one y-value.

(2,1), (2,1)

#s 1 - 18: Find the domain and range of each relation. Determine whether or not the relation is a function.

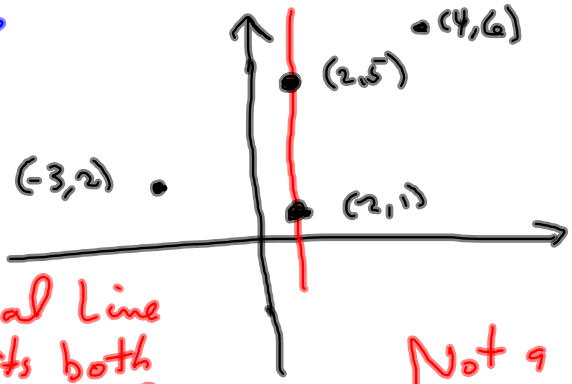
$\{(2,1), (2,5), (-3,2), (4,6)\}$

Domain $= \{2, -3, 4\}$

Range $= \{1, 5, 2, 6\}$

Not a function
(2,1) & (2,5) are both in the relation.

A graph of the relation.



This fails the Vertical Line Test: The line hits both (2,5) & (2,1).

Not a function.

A vertical line will only intersect a function at most once.

In a graph, a FUNCTION will never have two or more points are stacked above one another, hence the VERTICAL LINE TEST:

If no vertical line can be drawn so that it intersects a graph more than once, the graph is the graph of a function.

Function Notation
To denote that y is a function of x, we can write

$$y = f(x)$$

Reads like "f of x"

We say that y depends on x, because every x-value in the domain determines a y-value.

$f = \{ (\text{Minneapolis}, \text{cold}), (\text{Jacksonville}, \text{hot}), (\text{Seattle}, \text{wet}) \}$

$f(\text{Minneapolis}) = \text{cold}.$

$\text{Domain} = \{ \text{Minneapolis}, \text{Jacksonville}, \text{Seattle} \}$

$\text{Range} = \{ \text{cold}, \text{wet}, \text{hot} \}$

Note that the x-values don't necessarily depend on the y-value, since we can have different x-values being associated with the same y-value, and still have a function.

§3.2 Due Tuesday

§3.3 Ask questions Tuesday. Hand in by end of hour.

§3.2 # 56 $f(x) = 3x + 3$

(56) $f(-1) = ?$

$f(\square) =$

$3\square + 3$

$f(-1) = 3(-1) + 3$

$= -3 + 3$

$= 0 = f(-1)$

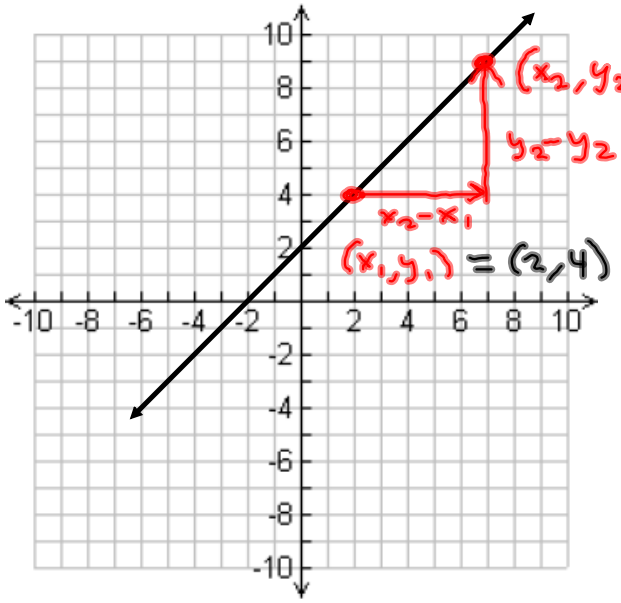
Example $f(x) = 11$ $f(-3) = 11$

$y = 11$ $f(7) = 11$

Like #67. A degenerate case.

$$\text{Slope} = \frac{\text{RISE}}{\text{RUN}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9-4}{7-2} = \frac{5}{5} = 1 = m$$

$$= \frac{\text{Change in } y}{\text{Change in } x}$$



What's the slope of the line thru (1,2) and (5,8)?

(x_1, y_1) (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8-2}{5-1} = \frac{6}{4} = \frac{3}{2}$$

What about

(2, 3) & (2, -7) ?

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-7-3}{2-2} = \frac{-10}{0}$$

Vertical Line $\boxed{x = 2}$

(2, 5) & (-3, 5) ?

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-5}{-3-2} = \frac{0}{-5} = 0$$

$\boxed{y = 5}$

3.4 I #s 2, 10, 11, 12, 26, 30, 32

3.4 II #s 60, 62, 90, 92, 94