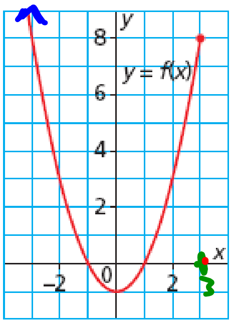
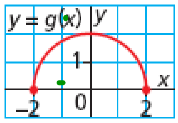
WARM - UP

Determine the domain and range of the graph of each function.

a) 

D: $x \leq 3, x \in R$

R: $y \geq -1, y \in R$

b) 

$x \mid$

$\in$

D: $\{-2 \leq x \leq 2, x \in R\}$

R: $\{y \mid 0 \leq y \leq 2, y \in R\}$

5.5 Graphs of Relations and Functions

In the workplace, a person's gross pay, P dollars, often depends on the number of hours worked, h.
So, we say P is the ?*dependent variable*. Since the number of hours worked, h, does not depend on the gross pay, P, we say that h is the ?*independent variable*.

independent variable → (x)

Hours Worked, h	Gross Pay, P (\$)
1	12
2	24
3	36
4	48
5	60

← dependent variable (y)

The values of the independent variable are listed in the first column of a table of values. These elements belong to the ?

The values of the dependent variable are listed in the second column of a table of values. These elements belong to the ?

Using Function Notation:

When a function is represented algebraically, we are given the rule as it applies to some variable. This is called functional notation. To compute the rule applied to any input we simply replace the variable with the input.

$-1^2 = -1$

$(-1)^2 =$

$$\begin{aligned} \text{Given: } f(x) &= x^2 \text{ then} \\ f(5) &= (5)^2 = 25 \\ f(-1) &= (-1)^2 = 1 \\ f(a+b) &= (a+b)^2 = a^2 + 2ab + b^2 \\ f(2y) &= (2y)^2 = 4y^2 \end{aligned}$$

$\Rightarrow y = x^2$

IMPORTANT!! $\boxed{f(x) = x^2}$

This does NOT mean f multiplied by x

Function Notation

- To represent functions, we use symbols like f(x) and g(x).
- The symbol f(x) is read "f of x" and simply means that the expression that follows involves x.
- Basically, f(x) represents where y is a function of the x variable.
- Thus, the notation is convient for making direct substitutions for the x variable.
- For example, if f(x) = 3x - 5, then f(7) = 3(7) - 5 = 16
- May also be represented as a mapping with the notation f : x.

EXAMPLES...

$h(w) = 3w^2 - w - 6$

#1. *If* $f(x) = 3x^2 - x - 6$, *find...*

a) $f(5)$

b) $f(-4)$

c) $f\left(\frac{2}{3}\right)$

(a) $f(5) = 3(5)^2 - (5) - 6$

$= 3(25) - 5 - 6$

$= 75 - 5 - 6$

$= 64$

$(5, 64)$

(b) $f(-4) = 3(-4)^2 - (-4) - 6$

$= 3(16) + 4 - 6$

$= 48 + 4 - 6$

$= 46$

$(-4)^2$

$f\left(\frac{2}{3}\right) = 3\left(\frac{2}{3}\right)^2 - \left(\frac{2}{3}\right) - 6$

$\boxed{a\,b/c}$

$\frac{3}{1}\left(\frac{4}{9}\right) - \frac{2}{3} - \frac{6}{1}$

$= \frac{12}{9} - \frac{6}{9} - \frac{54}{9}$

$= \frac{-48 \div 3}{9 \div 3} = -\frac{16}{3}$

$g(x) = -2x + 4$ & $w(y) = y^2 - 2$

ex. ① $g(-3)$

$= -2(-3) + 4$

$= 6 + 4$

$= \underline{10}$

② $w(5) = (5)^2 - 2$

$= 25 - 2$

$= \underline{23}$

③ $7w(-1) + 3g(0)$

$w(-1) = (-1)^2 - 2$

$= -1$

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

$= 4$

$7[(-1)^2 - 2] + 3[-2(0) + 4]$

$= 7(-1) + 3(4)$

$= 5$

④ $[w(2)]^2 - 3g(-3)$

$(2)^2 - 3(10)$

$4 - 30$

$= -26$

$w(2) = (2)^2 - 2$

$= 4 - 2$

$= 2$

$g(-3) = -2(-3) + 4$

$= 6 + 4$

$= 10$

ex.

$w[g(1)]$

$g(x) = -2x + 4$ & $w(y) = y^2 - 2$

$g(1) = -2(1) + 4$

$= 2$

$w(2) = (2)^2 - 2$

$= 4 - 2$

$= 2$

Attachments

Worksheet - Sketching Angles in Radians.doc

Warm-Up - Intro to Limits.docx

Review - Factoring.pdf

Worksheet - Factoring Review.doc