MCF3M Unit 1, Lesson 4

Function Notation

Suppose we want to define a quadratic function.

OLD Method: $y = x^2 + 3x - 4$ **NEW Method** $f(x) = x^2 + 3x - 4$

"f of x"

OLD Method:

Find the y-value of $y = x^2 + 3x - 4$ when x is equal to 3

$y = (3)^2 + 3(3) - 4$

$y = 9 + 9 - 4$

$y = 14$ when $x = 3$

$(3, 14)$

NEW Method:

Find $f(3)$

$f(3) = 3^2 + 3(3) - 4$

$f(3) = 9 + 9 - 4$

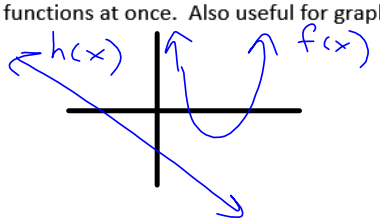
$f(3) = 14$

Besides using *f(x)* we could also name functions *g(x), h(x), P(n), V(t)* etc.

Very useful for working with several functions at once. Also useful for graphing.

$f(x) = 3x - 1$

$g(x) = \frac{1}{4}x + 3$



Example: Let f(x) = 2x – 3

Evaluate or simplify the following:

a) *f(-2)*

$f(-2) = 2(-2) - 3$

$f(-2) = -7$

b) *f(0)*

$f(0) = 2(0) - 3$

$f(0) = -3$

c) *f(2a)*

$f(2a) = 2(2a) - 3$

$= 4a - 3$

Example: Erika works at an electronics store and is payed every week according to the equation *E(s) = 0.032s + 300,* where *E(s)* is her earnings based on *s* sales in dollars.

E(s)

a) Evaluate E(4000) and interpret its meaning.

$E(4000) = 0.032(4000) + 300$

$= 428$

So she earns $428 for $4000 sales

b) When does E(s) = 600?

$0.032s + 300 = 600$

$\frac{0.032s}{.032} = \frac{300}{.032}$

$s = 9375$

MCF3M Unit 1, Lesson 4

Example Let f(x) = -2x + 3 and g(x) = $x^2 - 3x + 2$

a) Find *g(-2)*

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

$= 4 + 6 + 2$

$= 12$

b) Find $f\left(\frac{3}{4}\right)$

$f\left(\frac{3}{4}\right) = -2\left(\frac{3}{4}\right) + 3$

$= \frac{-6}{4} + 3$

$= \frac{-3}{2} + 3$

$= 3/2$

c) Find $2f(-1) + 3g(2)$

$= 2(-2(-1)+3) + 3(2^2 - 3(2) + 2)$

$= 2(5) + 3(0)$

$= 10$

d) Find $f(g(4))$

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

$= 16 - 12 + 2$

$g(4) = 6$

$f(g(4)) = f(6)$

$= -2(6) + 3$

$= -9$

e) When is *f(x) = 5*?

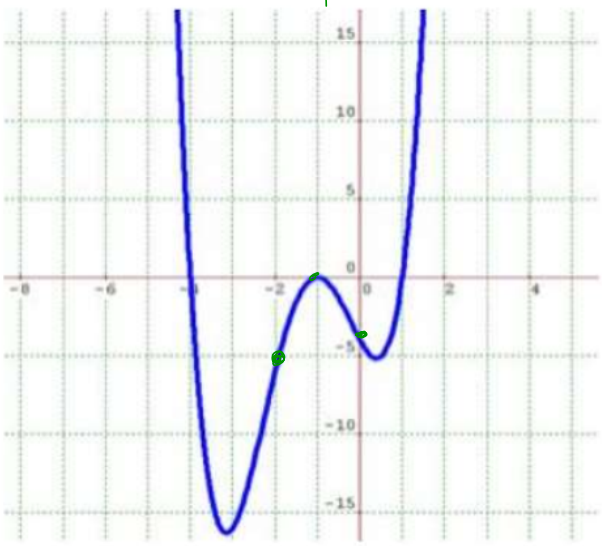
$-2x + 3 = 5$

$-2x = 5 - 3$

$-2x = 2$

$x = 1$

Example The graph represents a function *f(x)*.



a) Find *f(-2)*

$= -5$

b) Find *f(0)*. *What is this point called?*

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

c) When does *f(x) = 0*? What is this point called?

$x = -1, x = 1, x = -4$ (-1, 0) (1, 0) (-4, 0)

x-intercepts or zeroes

Never do this.

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

$g(2) = 3x^2 - 2$ ✗

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

$= 10$

OR This:

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

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

$= 10$

Text page 13 #8 – 11, 16

and page 54 #2 - 3