MCR3U Function Notation Name: _____

The equations of functions are often written using function notation. This is because the value of one variable (the output) depends on the value of the other variable (the input).

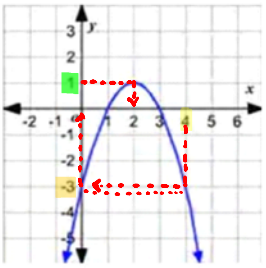
Ex: Distance depends on speed and time. If a train travels at a constant speed of 180 km/h, you can determine the distance it has travelled in a given amount of time, t hours. We can represent this relationship using the equation:

$$D(t) = 180t$$

Ex: The equation $y = 3x + 12$ might represent the cost of going on x rides at an amusement park. Since cost depends on the number of rides, the equation can be written as:

$$C(x) = 3x + 12$$

The graph shows the function $f(x) = (x - 2)^2 + 1$. Determine the following values:



$f(0) = -3$ $f(1) = 0$ $f(2) = 1$ $f(4) = -3$

What is the value of x when $f(x) = 1$? ... when $f(x) = -3$?

$x = 2$ $x = 0, x = 4$

Given $f(x) = 3x^2 - 4$, determine the following:

$f(4) = 3(4)^2 - 4$
$= 3(16) - 4$
$= 48 - 4$
$= 44$

$f(-2) = 3(-2)^2 - 4$
$= 3(4) - 4$
$= 12 - 4$
$= 8$

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

$f(a + 1) = 3(a+1)^2 - 4$
$= 3(a+1)(a+1) - 4$
$= 3(a^2 + 2a + 1) - 4$
$= 3a^2 + 6a + 3 - 4$
$= 3a^2 + 6a - 1$

What is the value of x when $f(x) = -1$? ... when $f(x) = 8$?

$3x^2 - 4 = -1$ (+4)
$3x^2 = 3$ (÷3)
$x^2 = 1$ (√)
$x = 1, -1$

$3x^2 - 4 = 8$ (+4)
$3x^2 = 12$ (÷3)
$x^2 = 4$ (√)
$x = 2, -2$

Given $g(x) = 2\sqrt{x} + 5$, determine the following:

$g(9) = 2\sqrt{9} + 5$
$= 2(3) + 5$
$= 6 + 5$
$= 11$

$g(-1) = 2\sqrt{-1} + 5$
DOES NOT EXIST
(negative value inside the square root)

$g(m) = 2\sqrt{m} + 5$

$g(4m^2) = 2\sqrt{4m^2} + 5$
$= 2(2m) + 5$
$= 4m + 5$