MCR 3U

FUNCTION NOTATION

Standard Notation	**Function Notation**

$$y = 2x + 1 \quad\quad\quad\quad\quad\longrightarrow\quad\quad f(x) = 2x + 1$$

Read as "$f \; of \; x \; equals$"

The function notation explicitly indicates that the "y" values are a function of the "x" values that are chosen for evaluation. In other words, $f(x)$ (or y) is the dependent variable and x is the independent variable.

NOTE: The symbol $f(x)$ does not mean "f times x", rather it means to evaluate the given rule at the given value of x.

EXAMPLE: Given $f(x) = 2x + 1$, evaluate $f(-3)$.

We are required to evaluate the function when $x = -3$, thus determining the y-coordinate of the relation.

$$f(-3) = 2(-3) + 1$$
$$= -5$$

EXERCISE 1: Given $f(x) = 1 - 4x - 2x^2$ and $g(x) = \dfrac{2x-1}{x+3}$, evaluate...

1. $f(-1)$ 　　　　　　　2. $f(3)$ 　　　　　　　3. $f(0)$

4. $f(2a)$ 　　　　　　　5. $f(a + 2)$ 　　　　6. $g(-2)$

7. $g(11)$ 　　　　　　　8. $g(-3)$ 　　　　　　9. $g(3a)$

10. $g(a - 2)$ 　　　　　11. $f(2) + g(2)$ 　　12. $g(3) - g(-1)$

EXERCISE 2A: Given $k(x) = x^2 + 3x - 4$ and $h(x) = 2x + 8$, evaluate...

1. $k(-2) - h(-3)$ 2. $\dfrac{h(4) - h(1)}{4 - 1}$ 3. $\dfrac{h(-5) - h(-1)}{-5 - (-1)}$
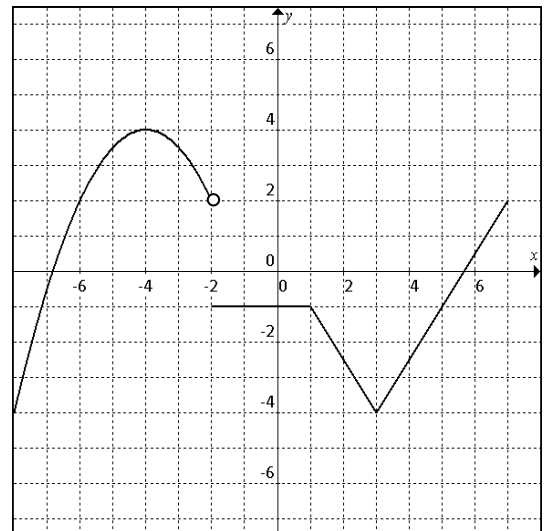
EXERCISE 2B: Using $k(x)$ and $h(x)$ in Exercise 2A, solve each equation.

4. $k(x) = 6$ 5. $h(x) = 6$ 6. $k(x) = h(x)$

EXERCISE 3: Consider the graph to the right.

Evaluate/solve each of the following:

1. $f(-6)$ 2. $f(1)$

3. $f(4)$ 4. $f(-2)$

5. $f(8)$ 6. $f(x) = 4$

7. $f(x) = 2$ 8. $f(x) = 0$

ANSWERS:

EX 1: 1. 3; 2. -29; 3. 1; 4. $1 - 8a - 8a^2$; 5. $-2a^2 - 12a - 15$; 6. -5; 7. 3/2; 8. undefined; 9. (6a-1)/(3a+3); 10. (2a-5)/(a+1); 11. -14.4; 12. 7/3

EX.2A: 1. -8; 2. 2; 3. 2; EX.2B: 6. x=-5, 2; 7. x=-1; 8. x=-4, 3

EX.3: 1. 2; 2. -1; 3. -2.5; 4. -1; 5. No answer; 6. -4; 7. -6, 7; 8. -6.8, 5.7