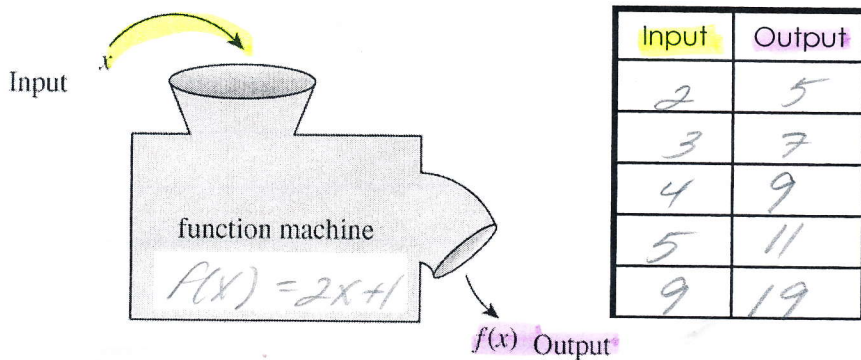


## Notes: Evaluating Functions

In a function the value of the output DEPENDS on the value of the input.

\*The input or the x-value is the independent variable.

\*The output or the y-value is the dependent variable.  
Remember that the y-value and  $f(x)$  both represent the output.



**Example 1:** Given  $f(x) = x^2 + 1$ , find  $f(2)$

$$\begin{aligned} f(2) &= (2)^2 + 1 \\ &= 4 + 1 \\ &= 5 \rightarrow \text{output} \end{aligned}$$

**Example 2:** Given  $g(x) = 5x + 3$  find  $g(m + 1)$

$$\begin{aligned} g(m+1) &= 5(m+1) + 3 \\ &= 5m + 5 + 3 \\ &= 5m + 8 \rightarrow \text{output} \end{aligned}$$

Practice

# Functional Notation

Created for you by Ms. Nhotsoubarh

**Aim:** You will be able to use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

1. If  $f(x) = |x^3 - 3|$  then  $f(-1)$  is equivalent to

1) 0

2) 2

3) -2

4) 4

$$\begin{aligned} &|(-1)^3 - 3| \\ &|-1 - 3| \\ &|-4| \\ &4 \end{aligned}$$

2. If  $f(x) = \frac{x}{x^2 - 16}$ , what is the value of  $f(-10)$ ?

1)  $-\frac{5}{2}$

2)  $-\frac{5}{42}$

3)  $\frac{5}{58}$

4)  $\frac{5}{18}$

$$\begin{aligned} &\frac{-10}{(-10)^2 - 16} \\ &\frac{-10}{100 - 16} \\ &\frac{-10 \text{ simplify}}{84} \\ &= -\frac{5}{42} \end{aligned}$$

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3. If  $f(x) = kx^2$ , and  $f(2) = 12$ , then  $k$  equals

1) 1  
 2) 2  
 3) 3  
 4) 4

$$f(2) = kx^2$$

$$12 = k(2)^2$$

$$12 = \frac{k(4)}{4}$$

$$3 = k$$

4. The height,  $f(x)$ , of a bouncing ball after  $x$  bounces is represented by

$f(x) = 80(0.5)^x$ . How many times higher is the first bounce than the fourth bounce?

$$f(1) = 80(0.5)^1 = 40$$

$$f(4) = 80(0.5)^4 = 5$$

$$\frac{40}{5} = 8$$

6. If  $f(x) = \frac{\sqrt{2x+3}}{6x-5}$ , then  $f\left(\frac{1}{2}\right) =$

$$\frac{\sqrt{2\left(\frac{1}{2}\right)+3}}{6\left(\frac{1}{2}\right)-5}$$

1) 1  
 2) -2  
 3) -1  
 4)  $-\frac{13}{3}$

$$= \frac{\sqrt{4}}{-2}$$

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

$$= -1$$

7. If  $f(x) = 2x^2 - 3x + 4$ , then  $f(x+3)$  is equal to

1)  $2x^2 - 3x + 7$   
 2)  $2x^2 - 3x + 13$   
 3)  $2x^2 + 9x + 13$   
 4)  $2x^2 + 9x + 25$

$$2(x+3)^2 - 3(x+3) + 4$$

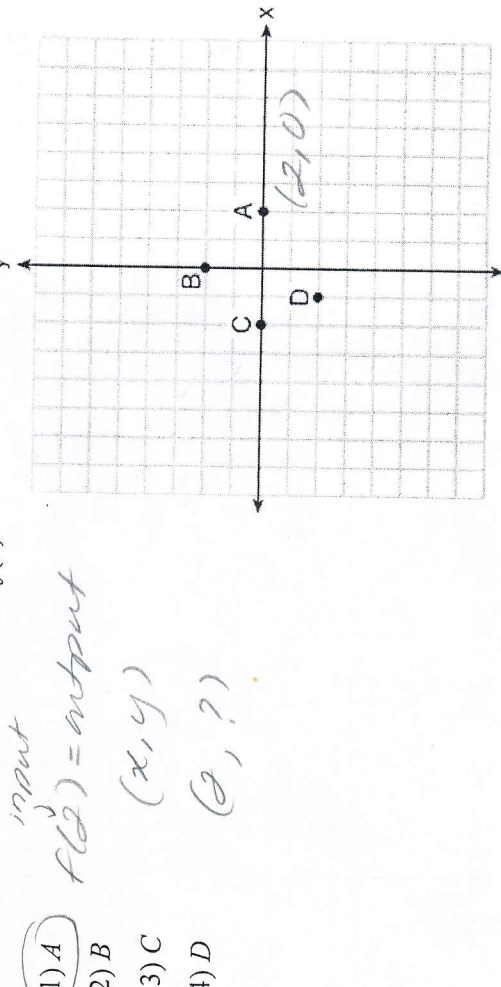
$$2(x^2 + 6x + 9) - 3x - 9 + 4$$

$$2x^2 + 12x + 18 - 3x - 9 + 4$$

$$2x^2 + 9x + 13$$

5. The graph of  $y = f(x)$  is shown below.

Which point could be used to find  $f(2)$ ?



8. A population of wolves in a county is represented by the equation

$P(t) = 80(0.98)^t$ , where  $t$  is the number of years since 1998. Predict the number of wolves in the population in the year 2008.

$P(t) = 80(0.98)^t$   
 $= 80(0.98)^{10}$   
 = plug into calc.  
 = 65 wolves

$t = 10 \text{ yrs}$   
 1998  $\rightarrow$  2008  
 is 10 yrs