FUNCTION NOTATION

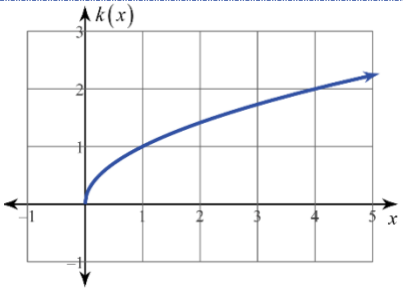
Algebraic (How to Write It)	Verbal (How to Read/Say It)
$(f \circ g)(x) = f(g(x))$	"f of g of x"

Making Observations

$f(x) = 3x^2 + 1$

$g(x) = x - 2$

x	$h(x)$
–2	–28
0	–7
2	14



Find the following using the given functions above.

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

$h(0) = -7$

$(f \circ g)(x) = f(g(x)) = 3(g(x))^2 + 1$
$= 3(x-2)^2 + 1$
$= 3x^2 - 12x + 13$

$(h \circ k)(4) = h(k(4))$
$= h(2)$
$= 14$

Verbalizing Observations

Applying Observations

Use your generalization to answer the question below.

Given functions $f(x) = 3x - 5$ and $g(x) = x^2 - 3$, what is the value of $f(g(-2))$?

(A) -11 **(B)** -2 **(C)** 1 **(D)** 118

FUNCTION NOTATION

Algebraic (How to Write It)	Verbal (How to Read/Say It)
$(f \pm g)(x) = f(x) \pm g(x)$	*"the sum/difference of* f and g*"*
$(fg)(x) = f(x) \cdot g(x)$	"f of x times g of x"

Making Observations

$f(x) = 3x^2 + 1$	$g(x) = x - 2$

Find the following using the given functions above.

$$(f+g)(x) = f(x) + g(x)$$
$$= (3x^2 + 1) + (x - 2)$$
$$= 3x^2 + x - 1$$

$$(f-g)(x) = f(x) - g(x)$$
$$= (3x^2 + 1) - (x - 2)$$
$$= 3x^2 - x + 3$$

$$(fg)(x) = f(x) \cdot g(x)$$
$$= (3x^2 + 1)(x - 2)$$
$$= 3x^3 - 6x^2 + x - 2$$

$$(f+g)(-2) = f(-2) + g(-2)$$
$$= (3(-2)^2 + 1) + ((-2) - 2)$$
$$= 13 + (-4)$$
$$= 9$$

Verbalizing Observations

Applying Observations

Use your generalization to answer the question below.

Let the polynomial functions f and g be defined as $f(x) = 2x^2 - 3x$ and $g(x) = x^2 - 3x + 4$. Let $h(x) = f(x) - g(x)$.

What are all the values of x for which $h(x) = 0$?

(F) -2 and 2 **(G)** 0 and $\frac{3}{2}$ **(H)** -1 and 4 **(J)** $-2i$ and $2i$