Solve:

Factor
$x^2+7x+10$

$(x+5)(x+2)$

2. $(2^4+4)\div 5\times 3-7+4$

$(16+4)\div 5\times 3-7+4$

$20\div 5\times 3-7+4$

$4\times 3-7+4$

$12-7+4$

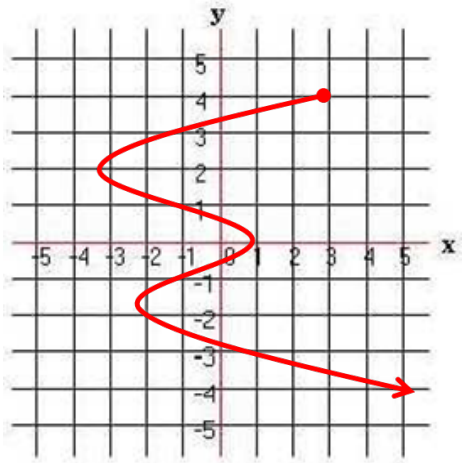
$5+4$

9

Operations with Functions 8\10

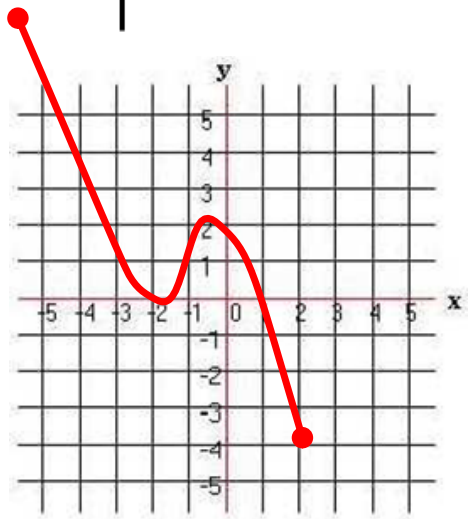
Function Notation

Is it a function? Give the domain and range.



Is the inverse a function?

Is it a function? Give the domain and range.



Is the inverse a function?

Function Notation

function name

function

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

$y = f(x)$ y is a function of x

Find:

$f(-3)$

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

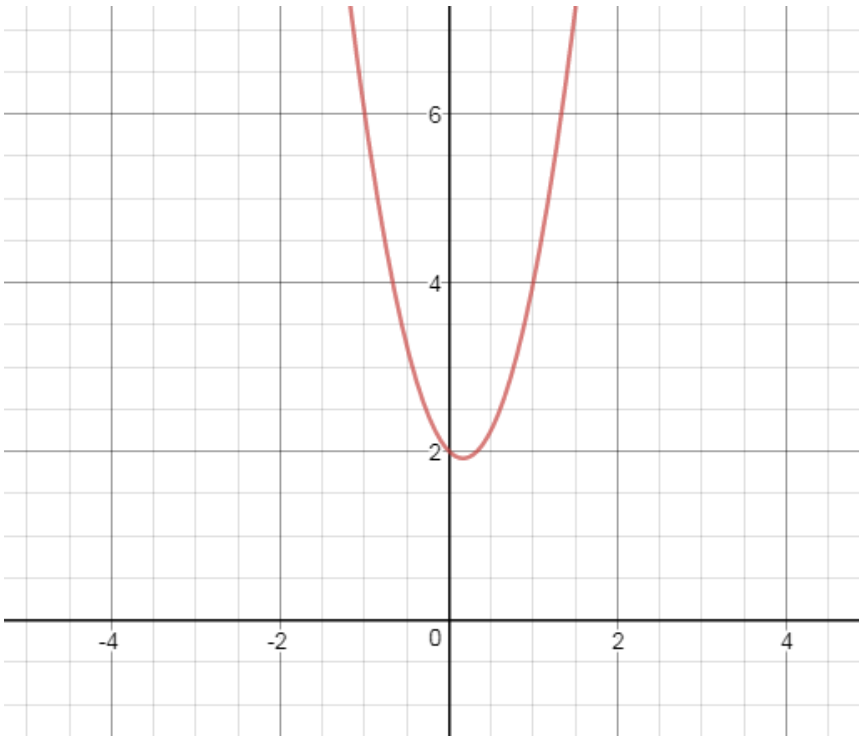
$f(-3) = 32$

x	f(x)
-3	32

$f(0)$

$f(0) = 2$

$f(4)$



Function Notation

$$f(x) = x^2 - x + 2$$

Find:

$f(m)$

$f(m) = (m)^2 - m + 2$

$m^2 - m + 2$

$f(m+3)$

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

$(m+3)(m+3)$

$m^2 + 6m + 9 - m - 3 + 2$

$m^2 + 5m + 8$

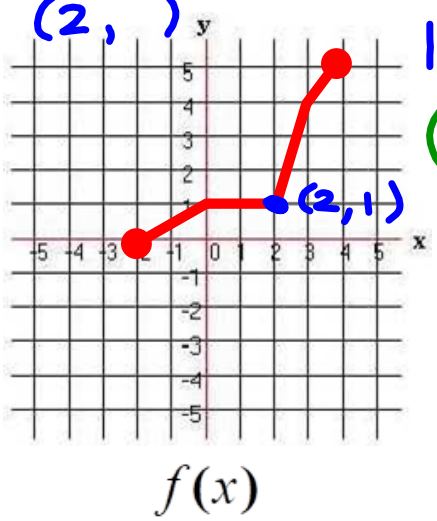
Since the value for y depends on what we use for x, we say that….

- Y is the dependent variable
- X is the independent variable

Operations with Functions

Find:

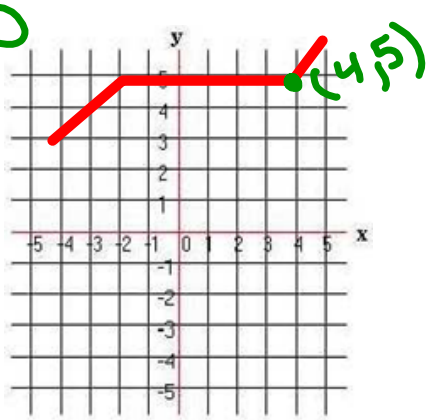
$$f(2)+g(4)$$



$f(x)$

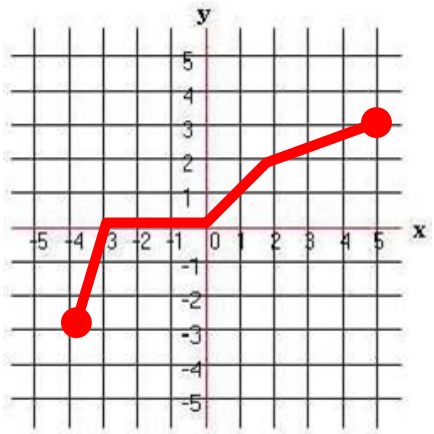
1 + 5

6

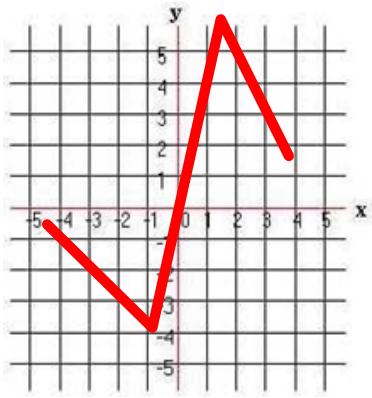


$g(x)$

Find: $f(-1)+g(0)$



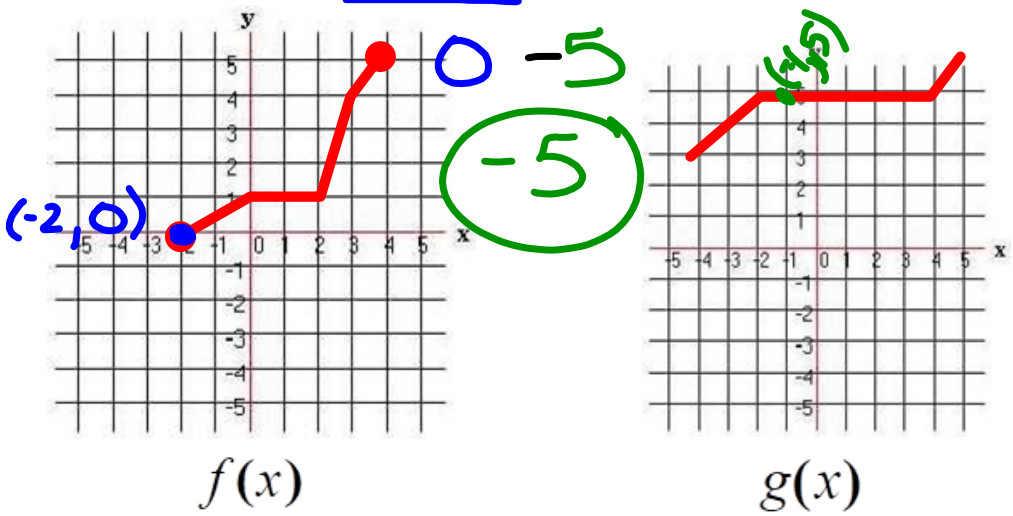
$f(x)$



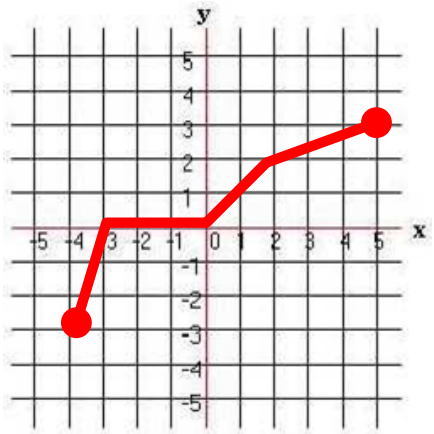
$g(x)$

Find:

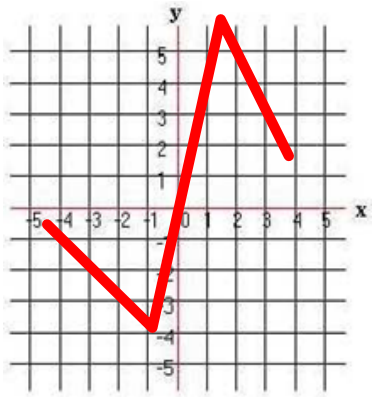
$$f(-2) - g(-1)$$



Find: $f(5)-g(0)$



$f(x)$



$g(x)$

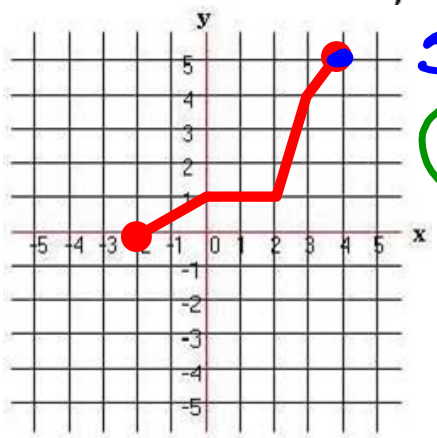
Find:

closed circle

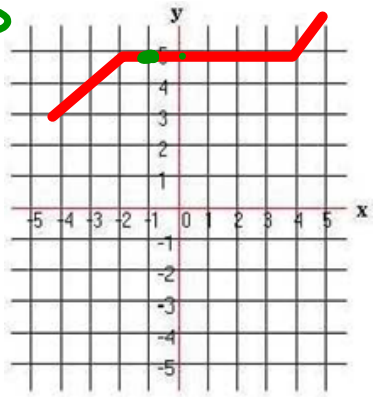
$$f(4)\cdot g(-1)$$

5 • 5

25

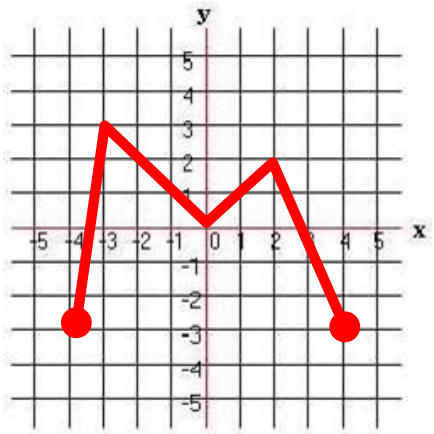


$f(x)$

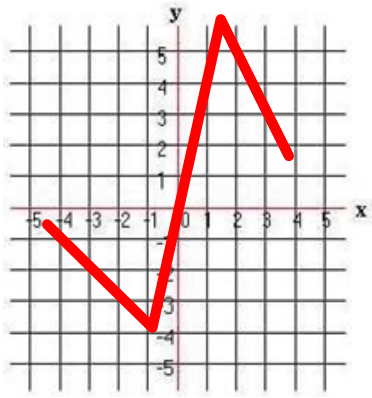


$g(x)$

Find: $f(-4) \cdot g(2)$

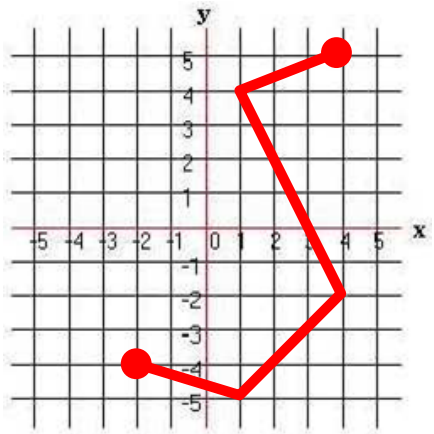


$f(x)$

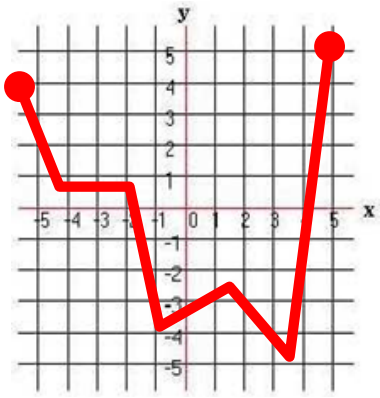


$g(x)$

Find: $f(-2) \div g(0)$

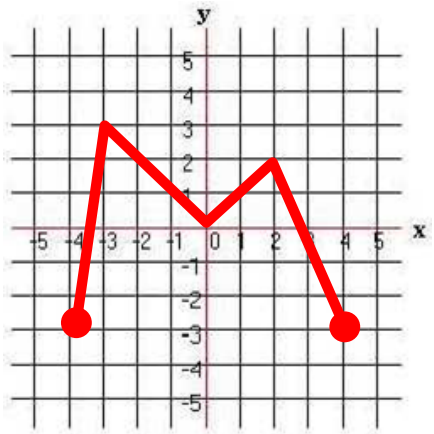


$f(x)$

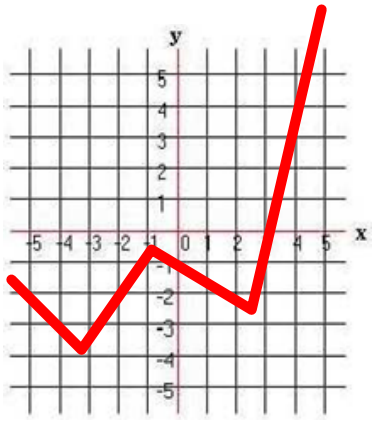


$g(x)$

Find: $g(5) \div f(-3)$



$f(x)$



$g(x)$

Compositions with Functions

Plug one function into the other function.

○ open circle

Find: $(f \circ g)(4)$

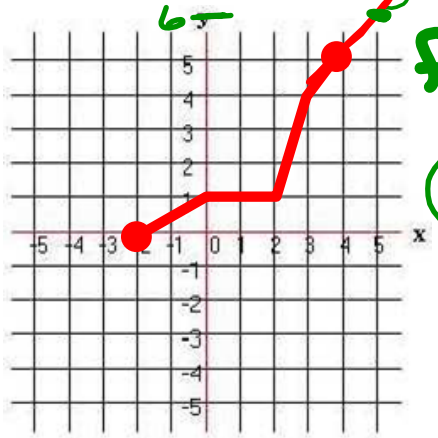
outside inside

$f(g(4))$

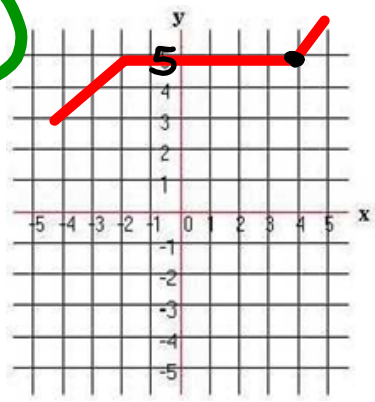
$f(5)$

6

$g(4) = 5$



$f(x)$



$g(x)$

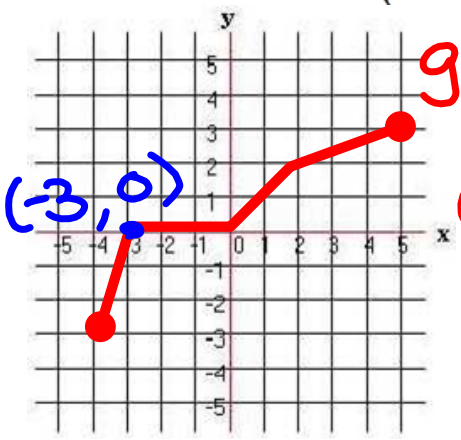
Find:

$(g \circ f)(-3)$ $g(f(-3))$

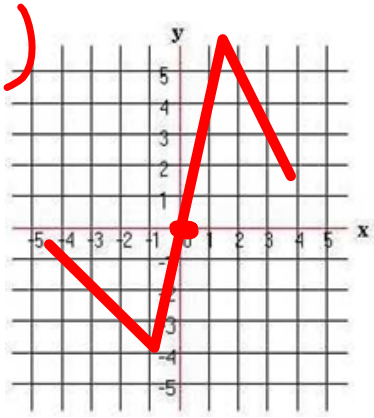
$g(0)$

0

(-3, 0)

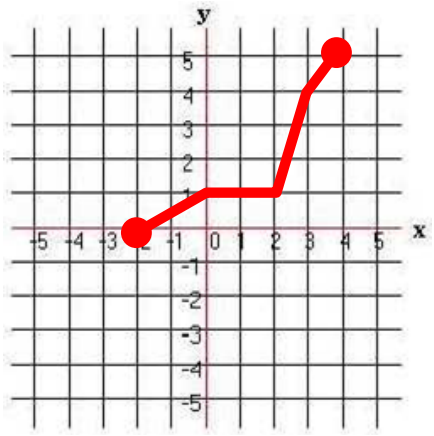


$f(x)$

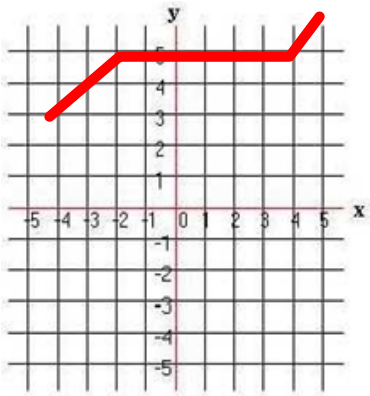


$g(x)$

Find: $f\left(g(-2)\right)$

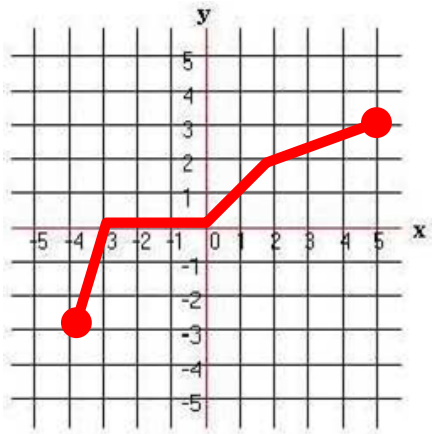


$f(x)$

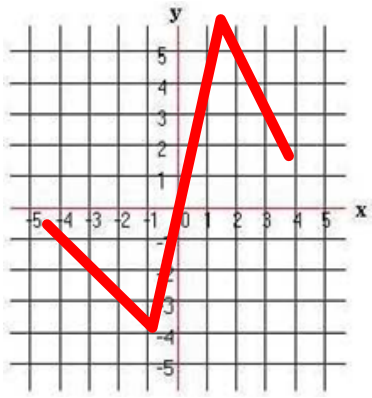


$g(x)$

Find: $f\left(g(0)\right)$

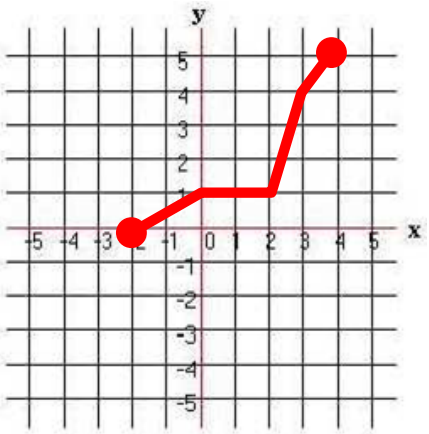


$f(x)$

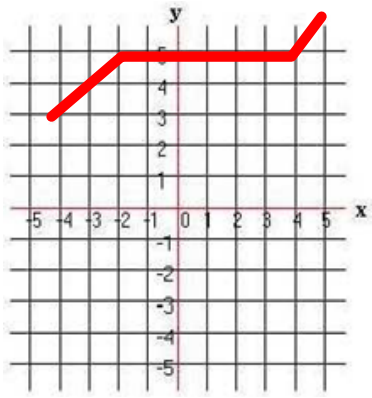


$g(x)$

Find: $f\left(f(-2)\right)$



$f(x)$



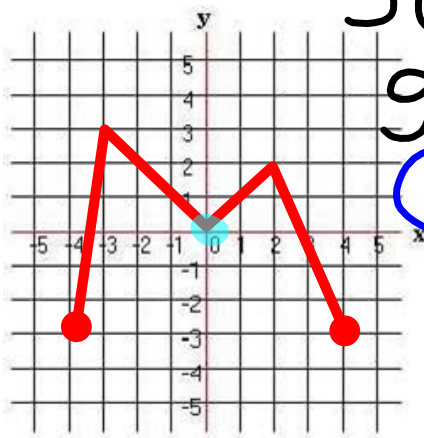
$g(x)$

Find: $g(f(g(0)))$

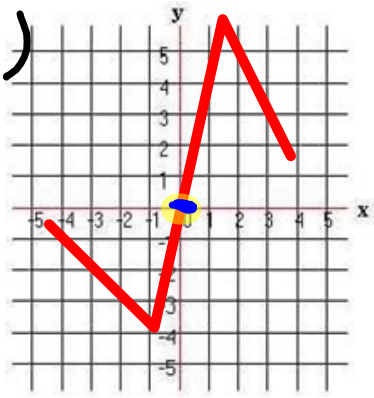
$g(f(0))$

$g(0)$

0

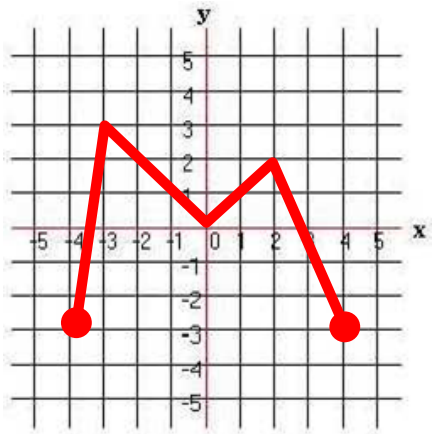


$f(x)$

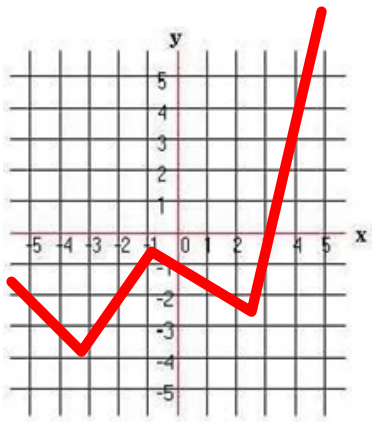


$g(x)$

Find: $\left[f \circ g(-2)\right] - \left[g \circ f(0)\right]$



$f(x)$



$g(x)$

Algebraically

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Operations With Functions

Operations

- Sum: $(f+g)(x) = f(x)+g(x)$ ← notation
- Difference: $(f-g)(x) = f(x)-g(x)$
- Product: $(f \cdot g)(x) = f(x) \cdot g(x)$
- Quotient: $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}, \quad g(x) \neq 0$

$f(x) = x^2 - x + 2$

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

f(x) + g(x)

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

$x^2 - x + 2 + x^2 + x - 4$

$2x^2 - 2$

g(x) + g(x)

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

$2x^2 + 2x - 8$

g(x) + f(x)

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

f(x)-g(x)

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

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

$5x-7$

g(x)-f(x)

$f(x) = 3x + 7$

$g(x) = 2x - 1$

f(x)=g(x)

$3x+7 = 2x-1$

$-2x \quad -2x$

$x+7 = -1$

$-7 \quad -7$

$x = -8$

f(x)=20

$3x+7 = 20$

$-7 \quad -7$

$3x = 13$

$x = \frac{13}{3}$

g(x)= 9

$f(x)=2x-3$ $g(x)= 3x-4$

$f(x) \cdot g(x)$

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

$6x^2-8x-9x+12$

$6x^2-17x+12$

$f(x)/g(x)$

$\frac{2x-3}{3x-4}$

$f(x) = 6x - 1$

$g(x) = 2x + 3$

$(f \circ g)(x) =$ outside inside

$6x - 1$

$6(2x+3) - 1$

$12x + 18 - 1$

$12x + 17$

$g \circ f =$ outside inside

$2x + 3$

$2(6x-1) + 3$

$12x - 2 + 3$

$12x + 1$

$$\begin{cases} f(x) = x^2 + 4 \\ g(x) = 7x \end{cases}$$

$(f \circ g)(x) =$

* outside inside

$(g \circ f)(-3) =$

$g(f(-3))$

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

plugged the number into the inside function & Simplified

$g(13)$

$7(13)$

plugged the answer into the outside function & Simplified

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