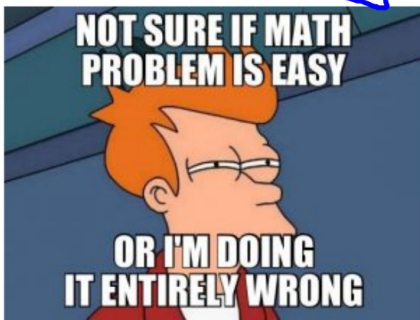


Evaluating Functions Review

$$f(x) = 2x + 6$$

Find $f(5)$

$$\begin{aligned} f(5) &= 2(5) + 6 \\ &= 10 + 6 \\ &= \boxed{16} \end{aligned}$$



$$g(x) = x^2 - 4x + 1$$

Find $g(4)$

$$\begin{aligned} g(4) &= (4)^2 - 4(4) + 1 \\ &= \boxed{1} \end{aligned}$$

Compositions of Functions

Notation:

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

$$f(g(x))$$

"f of g of x"

$$(g \circ h)(x)$$

$$g(h(x))$$

"g of h of x"

$$(f \circ f)(x)$$

$$f(f(x))$$

"f of f of x"

Given: $f(x) = 2x + 5$

$g(x) = 3 - 7x$

$h(x) = x^2 + 10$

① Find: $(f \circ g)(x) = f(g(x))$

$$\begin{aligned} f(g(x)) &= 2(3 - 7x) + 5 \\ &= 6 - 14x + 5 \\ &= \boxed{-14x + 11} \end{aligned}$$

Find: $(f \circ f)(x)$

$$\begin{aligned} (f \circ f)(x) &= 2(2x + 5) + 5 = 4x + 10 + 5 \\ &= \boxed{4x + 15} \end{aligned}$$

Find: $g(h(x))$

$$\begin{aligned} g(h(x)) &= 3 - 7(x^2 + 10) \\ &= 3 - 7x^2 - 70 \\ &= \boxed{-7x^2 - 67} \end{aligned}$$

Given $f(x) = 6x - 14$

$g(x) = 9x + 5$

⇒ Start on inside and work your way out

Find: $g(f(3))$

$$\begin{aligned} f(3) &= 6(3) - 14 \\ &= 18 - 14 \\ &= \boxed{4} \end{aligned}$$

$$\begin{aligned} g(f(3)) &= 9(4) + 5 \\ &= 36 + 5 \\ &= \boxed{41} \end{aligned}$$

Find: $(f \circ g)(-2) = f(g(-2))$

$$\begin{aligned} g(-2) &= 9(-2) + 5 \\ &= -18 + 5 \\ &= \boxed{-13} \end{aligned}$$

$$\begin{aligned} f(g(-2)) &= 6(-13) - 14 \\ &= \boxed{-92} \end{aligned}$$

Homework is Page 1.6 in Packet