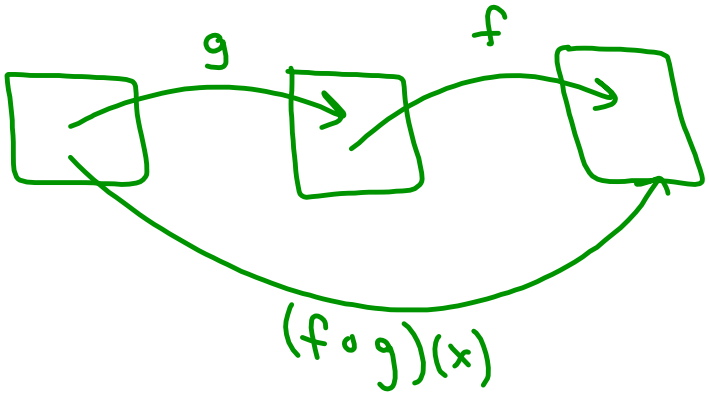
$(f \circ g)(x)$



16) $f(n) = 2n$ $g(n) = -n-4$ $(-\infty,\infty)$ $(-\infty,\infty)$

$(f \circ g)(n)$

$-n-4$

$2(-n-4)$

$(f \circ g)(n) = -2n-8$

D: $(-\infty,\infty)$

18) $(g \circ h)(n) = 2n+1$

D: (∞,∞)

19) $(h \circ g)(x) = 16x^2+8x-1$

$4x+1$

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

$(4x+1)(4x+1)$

$16x^2+8x+1-2$

$16x^2+8x-1$

21) $g(x) = 2x - 2$

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

$(g \circ f)(-2+x)$

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

$(-2+x)(-2+x)$

$4 - 4x + x^2 - 6 + 3x$

$x^2 - x - 2$

$2(x^2 - x - 2) - 2$

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

$2x^2 - 2x - 6$

Quiz Review

Ex 1 let $f(x)=\sqrt{4-x^2}$ $g(x)=3x+1$

$(-\infty,\infty)$

Find Domain: $4-x^2\geq 0$

$\sqrt{4}\geq\sqrt{x^2}$

$\pm 2\geq x$

$x\leq\pm 2$

* $<$ or $\leq$ → AND Statement

$-2\leq x\leq 2$

Find $\left(\frac{f}{g}\right)(x)=\frac{\sqrt{4-x^2}}{3x+1}$ $3x+1\neq 0$ $x\neq -\frac{1}{3}$ AND $[-2,2]$

Domain: $[-2,-\frac{1}{3})\cup(-\frac{1}{3},2]$

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

$3x+1$

$\sqrt{4-(3x+1)^2}$

$\sqrt{4-(9x^2+6x+1)}$

$\sqrt{4-9x^2-6x-1}$

$\sqrt{-9x^2-6x+3}$

$\sqrt{-3(3x^2+2x-1)}$

$\sqrt{-3\cdot(3x-1)(x+1)}$ $\cdot 3$ $-1/3$ $1/3$

Hope

$\sqrt{\#(x+1)(x+1)}$

$(x+1)\sqrt{\#}$

Domain:

$-9x^2-6x+3\geq 0$

$-3(3x-1)(x+1)\geq 0$

$3x-1\geq 0$ $x+1\geq 0$

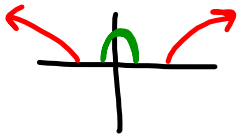
$x\geq\frac{1}{3}$ $x\geq -1$

$y = \sqrt{4 - x^2}$ $y = \sqrt{x^2 - 16}$

quadratic inside a square root

quadratic term (x^2)

- positive (OR) outside $x \geq 4$ or $x \leq -4$
- negative (and) inside $-2 \leq x \leq 2$



Try

$f(x) = x^2 - 16$ $g(x) = \sqrt{x}$

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

$\sqrt{x}$

$\sqrt{x}^2 - 16$

$f(g(x)) = x - 16$

D: $(-\infty, \infty)$

$x^2 - 16$

$\sqrt{x^2 - 16} = g(f(x))$

$x^2 - 16 \geq 0$

$x^2 \geq 16$ or $x \geq 4$ or $x \leq -4$

$x^2 \geq \pm 4$

D: $(-\infty, -4] \cup [4, \infty)$

Decomposing a function

$h(x) = (x+1)^2 - 3(x+1) + 4$

what could $f(x)$ or $g(x)$ be?

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

$(g \circ f)(x)$

p124 # 26, 27
13, 14, 18, 21, 22