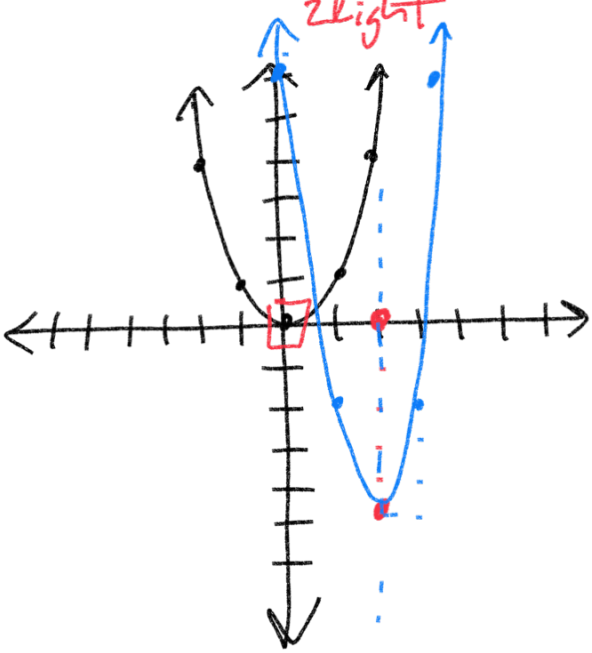
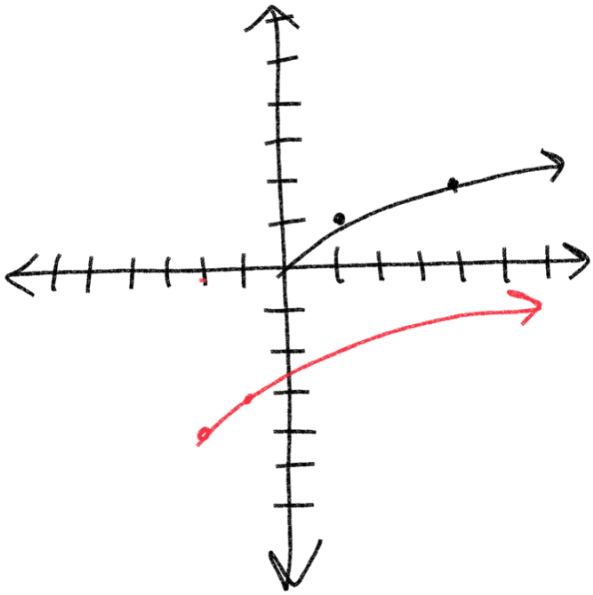
TH- PC Pre-Calculus 2/3

1.) $y = 3(x-2)^2 \boxed{-5}$

2 Right



2.) $y = \sqrt{x+2} - 4$



$f(x) = -2\boxed{x} - 5$

$g(x) = x + 4$

$f(g(x)) = -2(x+4) - 5$

$f \cdot g(x)$ $\quad -2x - 8 - 5$

$\boxed{-2x - 13}$

1.) $g(x) = x^3 + 3$

$f(x) = 2x + 1$

$g(f(x)) =$

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

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

$\boxed{8x^3 + 12x^2 + 6x + 1 + 3}$

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

$(2x+1)(2x+1)(2x+1) + 3$

$4x^2 + 2x + 2x + 1$

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

$8x^3 + 4x^2 + 8x^2 + 4x + 2x + 1 + 3$

$\boxed{8x^3 + 12x^2 + 6x + 4}$

$1 \leftarrow ()^0$

$1 \quad 1 \leftarrow ()^1$

$1 \quad 2 \quad 1 \leftarrow ()^2$

$1 \quad 3 \quad 3 \quad 1 \leftarrow ()^3$

$1 \quad 4 \quad 6 \quad 4 \quad 1$

$x^3 + 3x^2b + 3xb^2 + b^3$

$(x+b)^3$

$2x \quad 1$

$f(x) = x^2 - 4x$

$g(x) = x - 4$

$f(g(x))$

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

$(x-4)(x-4) - 4x + 16$

$x^2 - 4x - 4x + 16 - 4x + 16$

$\boxed{x^2 - 12x + 32}$

Find $\left(\frac{f}{g}\right)(x)$ $\quad f(x) = 2x-2$

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

$\frac{f(x)}{g(x)}$

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

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

$\cancel{(f \circ g)(x)}$

$\frac{\cancel{x^2}(2x-2)}{\cancel{x^2}(x-4)}$

$(f \cdot g)(x)$ $\quad f(x) = 2x-2$

$g(x) = x+2$

$\frac{2x^2-2}{x-4}$ $\quad x \neq 0$

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

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

$\boxed{2x^2 - 2x - 4}$

$f(x) = 2x-4$

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

① 1.) Find $(f-g)(x)$

2.) insert $x=4$

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

$\cancel{2x}-4-x^3-\cancel{2x}$

$-x^3-4$

$-(4)^3-4$ $\quad -64-4=-68$

② 1.) insert $x=4$

2.) $f(4)-g(4)$

$2(4)-4-[(4)^3+2(4)]$

$8-4-[64+8]$

$4-72=-68$

1.) $f(x) = -x + 5$

$g(x) = 3x + 1$

$(f+g)(x)$

$-x + 5 + 3x + 1$

$\boxed{2x + 6}$

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

$g(x) = 3x + 1$

$(f \cdot g)(-5)$

$f(-5) \cdot g(-5)$

$(2(-5) + 2) * (3(-5) + 1)$

$(-10 + 2) * (-15 + 1)$

$(-8) * (-14) = 112$

$(2x + 2)(3x + 1)$

$6x^2 + 2x + 6x + 2$

$6x^2 + 8x + 2$

$6(-5)^2 + 8(-5) + 2$

$6(25) - 40 + 2$

$150 - 40 + 2 = 112$

$f(x) = 3x - 4$

$g(x) = -2x + 3$

$f \circ g(x)$

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

$-6x + 9 - 4$

$-6x + 5$

$-6(-3) + 5 = 18 + 5 = 23$

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

$g(-3) = -2(-3) + 3$

$6 + 3 = 9$

$g(-3) = 9$

$f(9) = 3(9) - 4$

$27 - 4 = 23$

$f(x) = -x - 2$

$g(x) = 3x - 5$

$(g \circ f)(-10) = g(f(-10))$

$f(-10) = -(-10) - 2$

$10 - 2 = 8$

$3(-x - 2) - 5$

$-3x - 6 - 5$

$-3x - 11$

$-3(-10) - 11 \quad 30 - 11 = 19$

$g(8) = 3(8) - 5$

$24 - 5 = 19$