7.1 Operations on Functions (pg 407)

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

$(f+g)(x) = f(x) + g(x)$
$(f-g)(x) = f(x) - g(x)$
$(f \cdot g)(x) = f(x) \cdot g(x)$
$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}, g(x) \neq 0$
$(f \circ g)(x) = f(g(x))$

Ex 1a: $(f+g)(x) = f(x) + g(x)$

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

$x^2 + 2x - 3$

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

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

$x^2 - 4 - 2x - 1$

$x^2 - 2x - 5$

Ex #2a) $f(x) = x^2 + 7x + 12$ $g(x) = 3x - 4$

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

$(x^2 + 7x + 12)(3x - 4)$

$3x^3 - 4x^2 + 21x^2 - 28x + 36x - 48$

$3x^3 + 17x^2 + 8x - 48$

b) $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{x^2 + 7x + 12}{3x - 4}, x \neq 4/3$

$3x - 4 = 0$
$+4 \quad +4$
$\frac{3x}{3} = \frac{4}{3}$

Ex #3b) $f(x) = 2a - 5$ and $g(x) = 4a$

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

$f(4a)$

$2a - 5$

$2(4a) - 5$

$8a - 5$

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

$g(2a - 5)$

$4a$

$4(2a - 5)$

$8a - 20$

Ex #4: $d(x) = x - 0.12x$

$r(x) = x - 1500$

$(d \circ r)(x) = d(r(x))$

$d(x - 1500)$

$x - 0.12x$

$(x - 1500) - .12(x - 1500)$

$1x - 1500 - .12x + 180$

$.88x - 1320$

$.88(24{,}318) - 1320$

$20{,}240$

$(r \circ d)(x) = r(d(x))$

$r(x - .12x)$

$x - 1500$

$x - .12x - 1500$

$.88x - 1500$

$.88(24{,}500) - 1500$

$20{,}060$

(r od)x discount 1st then Rate

7.1 Operations on Functions (pg 409.)

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

$(f+g)(x) = f(x) + g(x)$

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

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

$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}, g(x) \neq 0$

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

Ex 1a: $(f+g)(x) = f(x) + g(x)$

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

$x^2 + 2x - 3$

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

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

$x^2 - 4 - 2x - 1$

$x^2 - 2x - 5$

Ex #2a) $f(x) = x^2 + 7x + 12$ $g(x) = 3x - 4$

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

$(x^2 + 7x + 12)(3x - 4)$

$3x^3 - 4x^2 + 21x^2 - 28x + 36x - 48$

$3x^3 + 17x^2 + 8x - 48$

b) $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{x^2 + 7x + 12}{3x - 4}, x \neq 4/3$

$3x - 4 = 0$

$+4 \quad +4$

$\frac{3x}{3} = \frac{4}{3}$

Ex #3b) $f(x) = 2a - 5$ and $g(x) = 4a$

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

$f(4a)$

$2a - 5$

$2(4a) - 5$

$8a - 5$

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

$g(2a - 5)$

$4a$

$4(2a - 5)$

$8a - 20$

Ex #4: $d(x) = x - 0.12x$

$r(x) = x - 1500$

$(d \circ r)(x) = d(r(x))$

$d(x - 1500)$

$x - 0.12x$

$(x - 1500) - .12(x - 1500)$

$1x - 1500 - .12x + 180$

$.88x - 1320$

$.88(24500) - 1320$

$20,240$

$(r \circ d)(x) = r(d(x))$

$r(x - .12x)$

$x - 1500$

$x - .12x - 1500$

$.88x - 1500$

$.88(24500) - 1500$

$20,060$

(rod)x discount 1st then Rate