1 Given $f(x) = x^2 - 3x + 1$ and $g(x) = 4x + 5$, find each function.

$(f+g)(x) = f(x) + g(x) = (x^2 - 3x + 1) + (4x + 5)$

$= x^2 - 3x + 1 + 4x + 5$

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

$(f-g)(x) = f(x) - g(x) = (x^2 - 3x + 1) - (4x + 5)$

$= x^2 - 3x + 1 - 4x - 5$

$(f-g)(x) = x^2 - 7x - 4$

$(f \cdot g)(x) = f(x) \cdot g(x) = (x^2 - 3x + 1)(4x + 5)$

$= 4x^3 + 5x^2 - 12x^2 - 15x + 4x + 5$

$(f \cdot g)(x) = 4x^3 - 7x^2 - 11x + 5$

$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{x^2 - 3x + 1}{4x + 5}, \; x \neq -\frac{5}{4}$

$4x + 5 = 0$

$4x = -5$

$x = -\frac{5}{4}$

Composition of Functions

$$[f \circ g](x) = f[g(x)]. = f(g(x))$$

f of g of x

$f(x) = x + 2$

$f(-4) = -4 + 2 = -2$

$f(n) = n + 2$

$f(y-3) = (y-3) + 2$
$= y - 1$

$f(x) = 2x + 4$

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

$= f(x-7) = 2(x-7) + 4$

$= 2x - 14 + 4$

$[f \circ g](x) = 2x - 10$

$g(x) = x - 7$

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

$= g(2x+4) = (2x+4) - 7$

$[g \circ f](x) = 2x - 3$

p. 389-390		
15-16, 28-31, 33-42, 46-47, 56-57		