## 7-3 Function Operations

std. 24.0

**ex. 1** Let $f(x) = 3x^{1/2}$, $g(x) = 2x^{1/2}$

$f(x) + g(x) =$ $5x^{1/2}$ $(5\sqrt{x})$ domain: $x \geq 0$

$f(x) \cdot g(x) =$ $3x^{1/2} \cdot 2x^{1/2} = 6x$ domain: $x \geq 0$

**ex. 2** Let $f(x) = x + 5$, $g(x) = x^2 - 25$

$f(x) - g(x) =$ $-x^2 + x + 30$ $x+5-(x^2-25)=$ domain: $x$ is all real #s

$\frac{f(x)}{g(x)} =$ $\frac{x+5}{x^2-25} = \frac{x+5}{(x+5)(x-5)} = \frac{1}{x-5}$ domain: $x \neq 5, -5$

## *Composition of Functions*

$f(g(x))$ "$f$ of $g$ of $x$"

**ex. 3** Let $f(x) = x^{-1}$, $g(x) = x + 1$

Domain ck. inside function + composition

$f(g(x)) = f(x+1) = (x+1)^{-1} = \frac{1}{x+1}$ domain: $x \neq -1$

$g(f(x)) = g(x^{-1}) = x^{-1} + 1 = \frac{1}{x} + 1$ domain: $x \neq 0$

$f(f(x)) = f(x^{-1}) = (x^{-1})^{-1} = x$ domain: $x \neq 0$