

Section 6.6 Function Operations

$(f+g)(x)$ means $f(x) + g(x)$

$$\begin{aligned} f(x) &= x^2 + 2x + 4 \\ g(x) &= -2x^2 - x + 3 \end{aligned} \quad \begin{aligned} (f+g)(x) & \\ &= (x^2 + 2x + 4) + (-2x^2 - x + 3) \\ &= x^2 + 2x + 4 - 2x^2 - x + 3 \\ &= x^2 - 2x^2 + 2x - x + 4 + 3 \\ &= -x^2 + x + 7 \end{aligned}$$

$(f-g)(x)$ means $f(x) - g(x)$ distribute the negative

$$\begin{aligned} f(x) &= 2x - 4 \\ g(x) &= 3x - 1 \end{aligned} \quad \begin{aligned} (f-g)(x) & \\ &= (2x - 4) - (3x - 1) \\ &= 2x - 4 - 3x + 1 \\ &= 2x - 3x - 4 + 1 \\ &= -x - 3 \end{aligned}$$

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

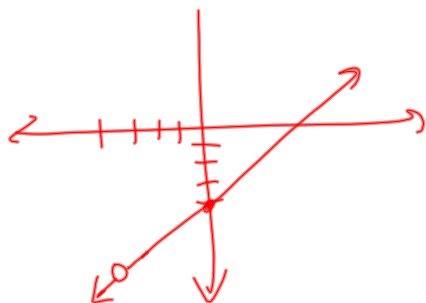
$$\begin{aligned} f(x) &= x + 2 \\ g(x) &= 3x - 1 \end{aligned} \quad \begin{aligned} (f \cdot g)(x) & \\ &= (x + 2)(3x - 1) \\ &= 3x^2 - x + 6x - 2 \\ &= 3x^2 + 5x - 2 \end{aligned}$$

$\left(\frac{f}{g}\right)(x)$ means $\frac{f(x)}{g(x)}$

$$\begin{aligned} f(x) &= x^2 - 16 \\ g(x) &= x + 4 \end{aligned} \quad \begin{aligned} \left(\frac{f}{g}\right)(x) & \\ &= \frac{x^2 - 16}{x + 4} \end{aligned}$$

$$\begin{array}{r} x + 4 = 0 \\ -4 \quad -4 \\ \hline x = -4 \end{array}$$

$$\begin{aligned} \frac{25}{15} &= \frac{5 \cdot 5}{3 \cdot 5} \\ \left(\frac{f}{g}\right)(x) &= \frac{x^2 - 16}{x + 4} \quad x \neq -4 \\ &= \frac{(x - 4)(x + 4)}{\cancel{x + 4}} \\ &= x - 4, \quad x \neq -4 \end{aligned}$$



Sec. 6.5

$$\left(\sqrt{x+5}\right)^2 = (7)^2$$

$$\begin{array}{r} x+5 = 49 \\ -5 \quad -5 \\ \hline \end{array}$$

$$x = 44$$

$$\begin{array}{r} \sqrt{x-7} + 3 = 12 \\ -3 \quad -3 \\ \hline \end{array}$$

$$\left(\sqrt{x-7}\right)^2 = 9^2$$

$$\begin{array}{r} x-7 = 81 \\ +7 \quad +7 \\ \hline \end{array}$$