

#4 on Quiz 1.7

$$f(x) = 3x^2 - 19x + 28, \quad g(x) = x - 4$$

$$f+g = 3x^2 - 19x + 28 + x - 4 \\ = \boxed{3x^2 - 18x + 24} \rightarrow D: (-\infty, \infty)$$

$$f-g = 3x^2 - 19x + 28 - (x - 4) \\ 3x^2 - 19x + 28 - x + 4 \\ \boxed{3x^2 - 20x + 32} \rightarrow D: (-\infty, \infty)$$

$$fg = (3x^2 - 18x + 24)(x - 4)$$

$$3x^3 - 12x^2 - 18x^2 + 72x + 24x - 96$$

$$\boxed{3x^3 - 30x^2 + 96x - 96} \quad (-\infty, \infty)$$

$$\frac{f}{g} = \frac{3x^2 - 18x + 24}{x - 4} = \frac{3(x^2 - 6x + 8)}{x - 4} = \frac{3(x-2)(x-4)}{(x-4)} = \boxed{3(x-2)}$$

$$D: (-\infty, 4) \cup (4, \infty)$$

4 is an excluded value of the domain because it makes the denominator zero.

#2 on 1.8 Inverse Functions Homework

$$f(x) = 7x - 6 \text{ and } g(x) = \frac{x+7}{6}$$

$$\begin{aligned} \text{a. } f(g(x)) &= 7\left(\frac{x+7}{6}\right) - 6 \\ &= \frac{7(x+7)}{6} - 6 \\ &= \frac{7x + 49}{6} - \frac{6 \cdot 6}{1 \cdot 6} \\ &= \frac{7x + 49}{6} - \frac{36}{6} \\ &= \frac{7x + 49 - 36}{6} \\ &= \boxed{\frac{7x + 13}{6}} \end{aligned}$$

$$\begin{aligned} \text{b. } g(f(x)) &= \frac{(7x - 6) + 7}{6} \\ &= \frac{7x - 6 + 7}{6} \\ &= \boxed{\frac{7x + 1}{6}} \end{aligned}$$