

HW 50

AAT

p234 # 9, 11-13, 37, 38, 41-43

$$\begin{aligned} 9. \quad a) \quad & f(x) + g(x) \\ &= x+2 + x-2 \\ &= 2x \end{aligned}$$

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

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

$$\begin{aligned} d) \quad & f(x) / g(x) \\ &= \frac{x+2}{x-2} \quad x \neq 2 \end{aligned}$$

$$\begin{aligned} 12. \quad a) \quad & f(x) + g(x) \\ &= 3x+1 + 5x-4 \\ &= 8x-3 \end{aligned}$$

$$\begin{aligned} b) \quad & f(x) - g(x) \\ &= 3x+1 - (5x-4) \\ &= -2x+5 \end{aligned}$$

$$\begin{aligned} c) \quad & f(x) \cdot g(x) \\ &= (3x+1)(5x-4) \\ &= 15x^2 - 7x - 4 \end{aligned}$$

$$\begin{aligned} d) \quad & f(x) / g(x) \\ &= \frac{3x+1}{5x-4} \quad x \neq 4/5 \end{aligned}$$

$$\begin{aligned} 11. \quad a) \quad & f(x) + g(x) \\ &= x^2 + 4x - 5 \end{aligned}$$

$$\begin{aligned} b) \quad & f(x) - g(x) \\ &= x^2 - (4x-5) \\ &= x^2 - 4x + 5 \end{aligned}$$

$$\begin{aligned} c) \quad & f(x) \cdot g(x) \\ &= x^2(4x-5) \\ &= 4x^3 - 5x^2 \end{aligned}$$

$$\begin{aligned} d) \quad & f(x) / g(x) \\ &= \frac{x^2}{4x-5} \quad x \neq 5/4 \end{aligned}$$

$$\begin{aligned} 13. \quad a) \quad & f(x) + g(x) \\ &= x^2 + 6 + \sqrt{1-x} \end{aligned}$$

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

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

$$\begin{aligned} d) \quad & f(x) / g(x) \\ &= \frac{x^2 + 6}{\sqrt{1-x}} \quad \begin{array}{l} 1-x \geq 0 \\ 1 \geq x \\ (-\infty, 1] \end{array} \end{aligned}$$

$$37. a) f(g(x)) \\ = (x-1)^2 \\ = x^2 - 2x + 1$$

$$b) g(f(x)) \\ = x^2 - 1$$

$$c) g(g(x)) \\ = x - 1 - 1 \\ = x - 2$$

$$38. a) f(g(x)) \\ = 3(5-x) + 5 \\ = 15 - 3x + 5 \\ = 20 - 3x$$

$$b) g(f(x)) \\ = 5 - (3x + 5) \\ = -3x$$

$$c) g(g(x)) \\ = 5 - (5 - x) \\ = x$$

$$41. D f(x): [-4, \infty) \\ D g(x): (-\infty, \infty)$$

$$a) f(g(x)) = \sqrt{x^2 + 4} \\ D: (-\infty, \infty)$$

$$b) g(f(x)) = (\sqrt{x+4})^2 \\ = x + 4 \\ D: [-4, \infty)$$

$$42. a) f(g(x)) = \sqrt[3]{x^3 + 1} - 5 \\ = \sqrt[3]{x^3 - 4} \\ D: (-\infty, \infty)$$

$$b) g(f(x)) = (\sqrt[3]{x-5})^3 + 1 \\ = x - 5 + 1 \\ = x - 4$$

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$$43. a) f(g(x)) = (\sqrt{x+1})^2 + 1 \\ = x + 1 \\ D: [0, \infty)$$

$$b) g(f(x)) = \sqrt{x^2 + 1} \\ \text{recovered} \\ \text{000} \\ D: (-\infty, \infty)$$