

Name: Key

Hour: _____

Due: _____

Combining Functions- Day 1

1. Given $f(x) = 2x + 3$ and $g(x) = 3x - 1$

a. Find $(f + g)(x)$

$$2x + 3 + 3x - 1$$

$$5x + 3 - 1$$

$$5x + 2$$

b. Solve $(f + g)(-1)$

$$5(-1) + 2$$

$$-5 + 2$$

$$-3$$

c. Solve $(f - g)(0)$

$$2x + 3 - (3x - 1)$$

$$2x + 3 - 3x + 1$$

$$-x + 4$$

$$-0 + 4$$

4

d. Find $(2f)(x)$

$$2(2x + 3)$$

$$4x + 6$$

e. Solve $(2f)\left(\frac{1}{2}\right)$

$$4\left(\frac{1}{2}\right) + 6$$

$$\frac{4}{2} + 6 = 2 + 6 = 8$$

2. Given $f(x) = 4x + 5$ and $g(x) = 5x + 2$

a. Find $(f + g)(x)$

$$4x + 5 + 5x + 2$$

$$9x + 7$$

b. Solve $(f + g)(-3)$

$$9(-3) + 7$$

$$-27 + 7$$

$$-20$$

c. Find $(f - g)(x)$

$$4x - 5 - (5x + 2)$$

$$4x - 5 - 5x - 2$$

$$-x - 7$$

d. Solve $(f - g)(0.5)$

$$-0.5 - 7 = -7.5$$

e. Solve $(2f)(8)$

$$2(4x + 5)$$

$$8x + 10$$

$$8(8) + 10$$

$$64 + 10$$

74

3. Given $f(x) = 2x^2 + 3x + 6$ and $g(x) = x^2 + 4x + 3$

a. Solve $(f + g)(-3)$

$$\begin{aligned} &2x^2 + 3x + 6 + x^2 + 4x + 3 \\ &3x^2 + 7x + 9 \\ &3(-3)^2 + 7(-3) + 9 \\ &3(9) + -21 + 9 \\ &27 + -21 + 9 \\ &15 \end{aligned}$$

b. Solve $(f - g)(2)$

$$\begin{aligned} &2x^2 + 3x + 6 - (x^2 + 4x + 3) \\ &2x^2 + 3x + 6 - x^2 - 4x - 3 \\ &x^2 - x + 3 \\ &2^2 - 2 + 3 \\ &4 - 2 + 3 \\ &2 + 3 \\ &5 \end{aligned}$$

c. Find $(g - f)(2)$

$$\begin{aligned} &x^2 + 4x + 3 - (2x^2 + 3x + 6) \\ &x^2 + 4x + 3 - 2x^2 - 3x - 6 \\ &-x^2 + x - 3 \\ &-(2^2) + 2 - 3 \\ &-4 + 2 - 3 \\ &-2 - 3 \\ &-5 \end{aligned}$$

4. Given $f(x) = 3x^2 - 4x + 5$ and $g(x) = -x^2 + 6$

a. Solve $(f + g)(-3)$

$$\begin{aligned} &3x^2 - 4x + 5 + -x^2 + 6 \\ &2x^2 - 4x + 11 \\ &2(-3)^2 - 4(-3) + 11 \\ &2(9) + 12 + 11 \\ &18 + 12 + 11 \\ &41 \end{aligned}$$

b. Solve $(f - g)(2)$

$$\begin{aligned} &3x^2 - 4x + 5 - (-x^2 + 6) \\ &3x^2 - 4x + 5 + x^2 - 6 \\ &4x^2 - 4x - 1 \\ &4(2)^2 - 4(2) - 1 \\ &4 \cdot 4 - 8 - 1 \\ &16 - 8 - 1 \\ &7 \end{aligned}$$

c. Solve $(g - f)(1)$

$$\begin{aligned} &-x^2 + 6 - (3x^2 - 4x + 5) \\ &-x^2 + 6 - 3x^2 + 4x - 5 \\ &-4x^2 + 4x + 1 \\ &-4(1)^2 + 4(1) + 1 \\ &-4 + 4 + 1 = 1 \end{aligned}$$