

4.18

Sum of Two Linear Functions

• Example 1

Given the functions $f(x) = 2x - 1$ and $g(x) = -3x + 4$

(a) Find $f + g$.

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

(b) Find $f - g$.

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

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

If we use the definition of the sum of two functions, we find that

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

As an alternative, we could use part (a) and say

$$(f + g)(x) = -x + 3$$

Therefore,

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

● ● ● CHECK YOURSELF 1

Given the functions $f(x) = -2x - 3$ and $g(x) = 5x - 1$,

- a. Find $f + g$. b. Find $f - g$. c. Find $(f + g)(2)$.

● ● ● CHECK YOURSELF ANSWER

1. (a) $3x - 4$; (b) $-7x - 2$; (c) 2.

4.18 Exercises

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Find **(a)** $f + g$, **(b)** $f - g$, **(c)** $(f + g)(3)$, and **(d)** $(f - g)(2)$.

1. $f(x) = -4x + 5$ $g(x) = 7x - 4$

2. $f(x) = 9x - 3$ $g(x) = -3x + 5$

3. $f(x) = 8x - 2$ $g(x) = -5x + 6$

4. $f(x) = -7x + 9$ $g(x) = 2x - 1$

5. $f(x) = x - 1$ $g(x) = -2x + 5$

6. $f(x) = -2x + 5$ $g(x) = 3x - 6$

7. $f(x) = -5x + 8$ $g(x) = 3x - 4$

8. $f(x) = x - 5$ $g(x) = 5x - 7$