

Exercise 4

Complete the computations in Exercises 1 to 4.

$$(2, 3, 5) - 4\mathbf{i} + 3\mathbf{j} = (?, ?, ?)$$

Solution

Each pair of parentheses represents a vector, and commas separate the vector's components. \mathbf{i} and \mathbf{j} are unit vectors for the first and second components, respectively.

$$(2, 3, 5) - 4\mathbf{i} + 3\mathbf{j} = (2, 3, 5) - 4(1, 0, 0) + 3(0, 1, 0)$$

Factors in front of parentheses are distributed to each component.

$$(2, 3, 5) - 4\mathbf{i} + 3\mathbf{j} = (2, 3, 5) - (4, 0, 0) + (0, 3, 0)$$

In adding or subtracting vectors, the respective components are added or subtracted.

$$\begin{aligned}(2, 3, 5) - 4\mathbf{i} + 3\mathbf{j} &= (2 - 4 + 0, 3 - 0 + 3, 5 - 0 + 0) \\ &= (-2, 6, 5)\end{aligned}$$