Exercise 2

Calculate $\mathbf{a} \cdot \mathbf{b}$, where $\mathbf{a} = 2\mathbf{i} + 10\mathbf{j} - 12\mathbf{k}$ and $\mathbf{b} = -3\mathbf{i} + 4\mathbf{k}$.

Solution

$$\begin{aligned}\mathbf{a} \cdot \mathbf{b} &= (2\mathbf{i} + 10\mathbf{j} - 12\mathbf{k}) \cdot (-3\mathbf{i} + 4\mathbf{k}) \\ &= (2)(-3) + (10)(0) + (-12)(4) \\ &= -6 + 0 - 48 \\ &= -54\end{aligned}$$