

Exercise 11

In the following exercises, use summation properties and formulas to rewrite and evaluate the sums.

$$\sum_{k=1}^{25} [(2k)^2 - 100k]$$

Solution

$$\begin{aligned}\sum_{k=1}^{25} [(2k)^2 - 100k] &= \sum_{k=1}^{25} (4k^2 - 100k) \\ &= \sum_{k=1}^{25} 4k^2 - \sum_{k=1}^{25} 100k \\ &= 4 \sum_{k=1}^{25} k^2 - 100 \sum_{k=1}^{25} k \\ &= 4 \left[\frac{25(25+1)(50+1)}{6} \right] - 100 \left[\frac{25(25+1)}{2} \right] \\ &= 4(5525) - 100(325) \\ &= -10\,400\end{aligned}$$