

Solution to Homework 8

Task. Use differentiation to find the minimum of the expression $(2x-5)^2+3x-6$.

Solution. When the minimum is attained, the derivative is 0. So, to find the value x at which the expression attains its minimum, we need to differentiate this expression and equate the derivative to 0. We get

$$2 \cdot 2 \cdot (2x - 5) + 3 = 0,$$

i.e., $8x - 20 + 3 = 0$, hence $8x = 20 - 3 = 17$ and $x = 2.125$. For this value x , the above expression has the form

$$\begin{aligned}(2 \cdot 2.125 - 5)^2 + 3 \cdot 2.125 - 6 &= (4.25 - 5)^2 + 6.375 - 6 = \\ 0.75^2 + 0.375 &= 0.5625 + 0.375 = 0.9375.\end{aligned}$$