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

\[
(2 \cdot 2.125 - 5)^2 + 3 \cdot 2.125 - 6 = (4.25 - 5)^2 + 6.375 - 6 =
\]

\[
0.75^2 + 0.375 = 0.5625 + 0.375 = 0.9375.
\]