Solution to Problem 20

**Task.** If we have $\mu(1) = 0.1$ and $\mu(2) = 0.9$, what value shall we assign to $\mu(1.6)$? Use linear interpolation.

**Solution.** If we know the value $y_1 = f(x_1)$ and the value $y_2 = f(x_2)$, then linear interpolation means estimating $f(x)$ as

$$f(x) = y_1 + \frac{y_2 - y_1}{x_2 - x_1} \cdot (x - x_1).$$

In our case, $x_1 = 1$, $y_1 = 0.1$, $x_2 = 2$, $y_2 = 0.9$, and $x = 1.6$. So, we get

$$\mu(1.6) = 0.1 + \frac{0.9 - 0.1}{2 - 1} \cdot (1.6 - 1) = 0.1 + \frac{0.8}{1} \cdot 0.6 = 0.1 + 0.48 = 0.58.$$