Zadatak 3. Pokaži da je nagib tangente u točki (x_0, y_0) na grafu funkcije $f(x) = ax^2 + bx + c$ jednak $2ax_0 + b$.

Rješenje. $f(x) = ax^2 + bx + c$;

$$\begin{aligned}\frac{\Delta y}{\Delta x} &= \frac{1}{\Delta x}[f(x_0 + \Delta x) - f(x_0)] = \frac{1}{\Delta x}[a(x_0^2 + 2x_0\Delta x + \Delta x^2) + b(x_0 + \Delta x) + c \\ &\quad - ax_0^2 - bx_0 - c] \\ &= \frac{1}{\Delta x}[ax_0^2 + 2ax_0\Delta x + a\Delta x^2 + bx_0 + b\Delta x - ax_0^2 - bx_0] \\ &= \frac{1}{\Delta x}[a\Delta x^2 + (2ax_0 + b)\Delta x] = a\Delta x + 2ax_0 + b \\ &\lim_{\Delta x \to 0} \frac{\Delta y}{\Delta x} = 2ax_b + b.\end{aligned}$$