Zadatak 12. Napiši jednadžbu tangente na parabolu $y = x^2$ ako tangenta prolazi točkom $T(2,3)$.

Rješenje. $y = x^2$, $T(2,3)$;

$$k = \lim_{\Delta x \to 0} \frac{1}{\Delta x}[(x_0 + \Delta x)^2 - x_0^2] = \lim_{\Delta x \to 0} \frac{1}{\Delta x}[x_0^2 + 2x_0\Delta x + \Delta x^2 - x_0^2]$$

$$= \lim_{\Delta x \to 0}(2x_0 + \Delta x) = 2x_0, \quad y(x_0) = x_0^2 \implies D(x_0, x_0^2)$$

$$3 = 2x_0 \cdot 2 + l \implies 3 = 4x_0 + l$$

$$k = \frac{3 - x_0^2}{2 - x_0} = 2x_0 \implies 3 - x_0^2 = 4x_0 - 2x_0^2 \implies x_0^2 - 4x_0 + 3 = 0$$

$$\implies (x_0 - 1)(x_0 - 3) = 0 \implies (x_0)_1 = 1, \quad (x_0)_2 = 3$$

$$3 = 4 + l \implies l_1 = -1, \quad 3 = 12 + l \implies l_2 = -9$$

$$\implies y = 2x - 1 \quad \text{ili} \quad y = 6x - 9.$$