

Zadatak 14. Odredi ekstreme funkcije $f(x) = \sqrt{2x^2 - x + 2}$.

Rješenje.

$$f'(x) = \frac{4x - 1}{2\sqrt{2x^2 - x + 2}},$$

$$f''(x) = \frac{1}{2} \left[\frac{4\sqrt{2x^2 - x + 2} - (4x - 1)^2 \frac{1}{\sqrt{2x^2 - x + 2}}}{2x^2 - x + 2} \right]$$

$$= \frac{1}{2} \cdot \frac{4(2x^2 - x + 2) - (4x - 1)^2}{(2x^2 - x + 2)^{3/2}} = \frac{8x^2 - 4x + 8 - 16x^2 + 8x - 1}{2(2x^2 - x + 2)\sqrt{2x^2 - x + 2}}$$

$$= \frac{-8x^2 + 4x + 7}{2(2x^2 - x + 2)\sqrt{2x^2 - x + 2}}. \quad \text{Stacionarna točka je } \frac{1}{4}. \quad f''\left(\frac{1}{4}\right) =$$

$$\frac{\frac{15}{2}}{2 \cdot \frac{15}{8} \cdot \sqrt{\frac{15}{8}}} = \frac{4\sqrt{2}}{\sqrt{15}} > 0 \text{ slijedi da je } x = \frac{1}{4} \text{ lokalni minimum. Vrijednost}$$

$$\text{funkcije u } x = \frac{1}{4} \text{ je } f\left(\frac{1}{4}\right) = \sqrt{\frac{15}{8}} \cdot m\left(\frac{1}{4}, \sqrt{\frac{15}{8}}\right).$$