

6. cvičení - výsledky

Příklad 1.

- (a) Maximum hodnoty e v bodech $[1, 0]$ a minimum hodnoty $\frac{1}{e}$ v bodě $[-1, 0]$.
- (b) Maximum hodnoty 1 v bodě $[1, 0]$ a minimum hodnoty 0 v bodech $[0, y], y \in [0, 1]$.
- (c) Maximum hodnoty 1 v bodech $[\pm 1, 0]$ a minimum hodnoty $\frac{1}{4}$ v bodech $[0, \pm \frac{1}{2}]$.
- (d) Maximum hodnoty 5 v bodech $[1, 1, 1], [1, -1, 1], [-1, 1, 1], [-1, -1, 1]$ a minimum hodnoty -1 v bodě $[0, 0, -1]$.
- (e) Maximum hodnoty $\frac{17}{4}$ v bodech $[\frac{3}{10}, \frac{4}{5}], [-\frac{3}{10}, -\frac{4}{5}]$ a minimum hodnoty -2 v bodech $[\frac{2}{5}, -\frac{3}{5}], [-\frac{2}{5}, \frac{3}{5}]$.
- (f) Maximum hodnoty $\frac{1}{e}$ v bodech splňujících $x^2 + y^2 = 1$ a minimum hodnoty 0 v bodě $[0, 0]$.
- (g) Maximum hodnoty $\frac{1}{2e}$ v bodě $[\frac{1}{2}, 0]$ a minimum hodnoty 0 v bodě $[0, 0]$.
- (h) Supremum hodnoty $\frac{1}{2e}$ a infimum hodnoty 0 . Maxima ani minima se nenabývá.
- (i) Maximum hodnoty $\frac{5}{e}$ v bodech $[0, \pm 1]$ a minimum hodnoty 0 v bodě $[0, 0]$.

Příklad 2.

- (a) Maximum je v $[\frac{1}{3}, -\frac{2}{3}, \frac{2}{3}]$ a minimum v $[-\frac{1}{3}, \frac{2}{3}, -\frac{2}{3}]$.
- (b) Maximum je v $[\frac{2}{\sqrt{78}}, -\frac{7}{\sqrt{78}}, \frac{5}{\sqrt{78}}]$ a minimum v $[-\frac{2}{\sqrt{78}}, \frac{7}{\sqrt{78}}, -\frac{5}{\sqrt{78}}]$.
- (c) Maximum je v $[\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}]$ a minimum v $[-\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}], [\frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}, \mp \frac{1}{\sqrt{3}}]$.
- (d) Maximum v $[\frac{\pi}{6}, \frac{\pi}{6}, \frac{\pi}{6}]$ a minima se nenabývá.
- (e) Maximum v $[\frac{a}{6}, \frac{a}{6}, \frac{a}{6}]$ a minima se nenabývá.
- (f) Maximum je v $[\pm \sqrt{\frac{7}{3}} \sqrt{\frac{5}{12}}, \sqrt{\frac{5}{12}}]$ a minimum v $[0, 0]$.

Příklad 3.

- (a) Maximum je v $[\frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}], [-\frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}, \mp \frac{1}{\sqrt{3}}]$ a minimum v $[\frac{1}{\sqrt{3}}, \mp \frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}], [-\frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}]$.
- (b) Maximum je v $[\frac{2}{\sqrt{6}}, -\frac{1}{\sqrt{6}}, -\frac{1}{\sqrt{6}}], [-\frac{1}{\sqrt{6}}, \frac{2}{\sqrt{6}}, -\frac{1}{\sqrt{6}}], [-\frac{1}{\sqrt{6}}, -\frac{1}{\sqrt{6}}, \frac{2}{\sqrt{6}}]$ a minimum v $[-\frac{2}{\sqrt{6}}, \frac{1}{\sqrt{6}}, \frac{1}{\sqrt{6}}], [\frac{1}{\sqrt{6}}, -\frac{2}{\sqrt{6}}, \frac{1}{\sqrt{6}}], [\frac{1}{\sqrt{6}}, \frac{1}{\sqrt{6}}, -\frac{2}{\sqrt{6}}]$.
- (c) Maximum v $[1, 1]$ a minimum v $[0, 0]$.
- (d) Maximum v $[\pm \frac{\sqrt{3}}{2}, \frac{1}{2}]$ a minimum v $[\pm \frac{\sqrt{3}}{2}, -\frac{1}{2}]$.
- (e) Maximum je v $[\frac{1}{4}\sqrt{a}\sqrt[4]{15}, \frac{1}{4}\sqrt{a}\sqrt[4]{15^3}]$ a minimum v $[-\frac{1}{4}\sqrt{a}\sqrt[4]{15}, -\frac{1}{4}\sqrt{a}\sqrt[4]{15^3}]$.
- (f) Maximum je v $[\frac{1}{\sqrt{102}}, -\frac{1}{\sqrt{102}}, \frac{10}{\sqrt{102}}]$ a minimum v $[-\frac{1}{\sqrt{102}}, \frac{1}{\sqrt{102}}, -\frac{10}{\sqrt{102}}]$.
- (g) Maximum je v $[\frac{9}{5}, \frac{13}{5}]$ a minimum v $[\frac{1}{5}, \frac{7}{5}]$.

- (h) Maximum je $v \left[\frac{\sqrt{5}}{2}, 2\sqrt{5} \right]$ a minimum $v \left[-\frac{\sqrt{5}}{2}, -2\sqrt{5} \right]$.
- (i) Maximum $v \left[\frac{2\sqrt{2}}{\sqrt[4]{5}}, \frac{2}{\sqrt[4]{5}} \right]$ a minimum $v \left[\frac{2\sqrt{2}}{\sqrt[4]{5}}, -\frac{2}{\sqrt[4]{5}} \right]$.
- (j) Maximum $v [0, 1]$ a minimum $v [0, 0]$.
- (k) Maximum $v \left[\frac{1 \pm \sqrt{5}}{4}, \frac{1}{2}, \frac{1 \mp \sqrt{5}}{4} \right]$ a minimum $v \left[\frac{2}{3}, -\frac{1}{3}, \frac{2}{3} \right]$.
- (l) Maximum $v \left[-\frac{1}{2}, 0 \right]$ a minimum $v [-2, 0]$.
- (m) Maximum $v \left[\pm \frac{1}{\sqrt{2}}, \pm \frac{1}{\sqrt{2}}, 0 \right]$ a minimum $v \left[\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, \pm 1 \right], \left[-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, \pm 1 \right]$.
- (n) Maximum $v [0, \pm \frac{1}{2}]$ a minimum $v [0, 0]$.
- (o) Maximum $v \left[\pm \frac{1}{2}, \pm \frac{1}{2}, \frac{1}{\sqrt{2}} \right]$ a minimum $v \left[\pm \frac{1}{2}, \mp \frac{1}{2}, -\frac{1}{\sqrt{2}} \right]$.
- (p) Maximum $v \left[\frac{\sqrt{5}-1}{2}, 0, \sqrt{\frac{\sqrt{5}-1}{2}} \right]$ a minimum $v \left[\frac{\sqrt{5}-1}{2}, 0, -\sqrt{\frac{\sqrt{5}-1}{2}} \right]$.
- (q) Maximum $v \left[\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} \right]$ a minimum $v [0, 0]$.