

5. cvičení - výsledky

Příklad 1.

- (a) $\frac{\partial \varphi}{\partial x}(1, 0) = 1, \frac{\partial \varphi}{\partial y}(1, 0) = 0, \frac{\partial \psi}{\partial x}(1, 0) = 0, \frac{\partial \psi}{\partial y}(1, 0) = 1.$
- (b) $\frac{\partial \varphi}{\partial x}(1, 2) = 0, \frac{\partial \varphi}{\partial y}(1, 2) = -\frac{1}{3}, \frac{\partial \psi}{\partial x}(1, 2) = -1, \frac{\partial \psi}{\partial y}(1, 2) = \frac{1}{3}.$
- (c) $\frac{\partial \varphi}{\partial x}(1 + e, e) = \frac{1}{e+1}, \frac{\partial \varphi}{\partial y}(1 + e, e) = 0, \frac{\partial \psi}{\partial x}(1 + e, e) = \frac{-e}{e+1}, \frac{\partial \psi}{\partial y}(1 + e, e) = 1.$
- (d) $\frac{\partial \varphi}{\partial x}(1, 1) = -\frac{51}{66}, \frac{\partial \varphi}{\partial y}(1, 1) = \frac{1}{22}, \frac{\partial \psi}{\partial x}(1, 1) = \frac{-3}{22}, \frac{\partial \psi}{\partial y}(1, 1) = -\frac{5}{22}.$

Příklad 2.

- (a) $\varphi'(1) = -1, \varphi''(1) = 0$ a tečna je $x = 2 - y.$
- (b) $\varphi'(-1) = -2, \varphi''(-1) = 2$ a tečna je $x = -2y.$
- (c) $\varphi'(1) = \frac{1}{3}, \varphi''(1) = \frac{32}{27}$ a tečna je $x = \frac{y}{3} + 1 - \frac{\pi}{3}.$

Příklad 3.

- (a) $\varphi'(\frac{\pi}{4}) = -1, \varphi''(\frac{\pi}{4}) = -\frac{32}{9}$ a tečna je $y = \frac{\pi}{2} - x.$
- (b) $\varphi'(\pi) = \frac{2e^{\pi}-3}{2e^{\pi}+3}, \varphi''(\pi) = -24 \frac{2e^{2\pi}-3}{(2e^{2\pi}+3)^3}$ a tečna je $y = \pi + \frac{2e^{\pi}-3}{2e^{\pi}+3}(x - \pi).$
- (c) $\varphi'(2) = -\frac{2}{5}, \varphi''(2) = \frac{24}{125}$ a tečna je $y = -1 - \frac{2}{5}(x - 2).$
- (d) $\varphi'(1) = -\frac{1}{3}, \varphi''(1) = -\frac{70}{27}$ a tečna je $y = 1 - \frac{1}{3}(x - 1).$

Příklad 4.

- (a) $\frac{\partial \varphi_1}{\partial x}(0, 0) = -1, \frac{\partial \varphi_1}{\partial y}(0, 0) = 0.$
- (b) $\frac{\partial \varphi_1}{\partial x}(0, 0) = -1, \frac{\partial \varphi_1}{\partial y}(0, 0) = 0.$
- (c) $\frac{\partial \varphi_1}{\partial x}(0, 0) = -\frac{4}{\pi}, \frac{\partial \varphi_1}{\partial y}(0, 0) = -2.$