Konvexita, konkávita $f(x) = e^{\frac{1}{x}}$

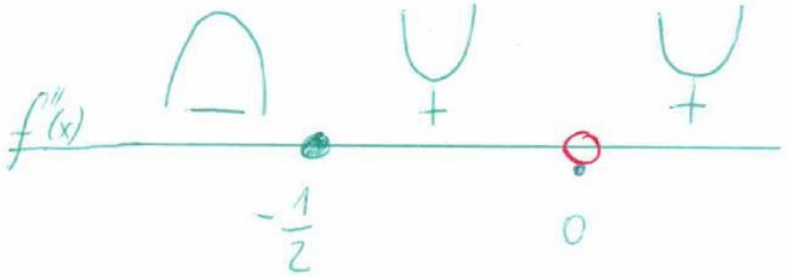
I) Definiční obor $\underline{x \neq 0}$ $x \in (-\infty, 0) \cup (0, \infty)$

II) $f'(x) = e^{\frac{1}{x}} \cdot \left(-\frac{1}{x^2}\right) = -x^{-2} \cdot e^{\frac{1}{x}}$

III) $\underline{f''(x)} = +2x^{-3} \cdot e^{\frac{1}{x}} + (-x^{-2}) \cdot e^{\frac{1}{x}} \cdot \left(-\frac{1}{x^2}\right) =$

$$= 2\frac{1}{x^3} \cdot e^{\frac{1}{x}} + \frac{1}{x^2} \cdot \frac{1}{x^2} \cdot e^{\frac{1}{x}} = e^{\frac{1}{x}}\left(\frac{2}{x^3} + \frac{1}{x^4}\right) = \underline{e^{\frac{1}{x}}\left(\frac{2x+1}{x^4}\right)}$$

IV) Nulové body $\underbrace{e^{\frac{1}{x}}}_{>0}\left(\frac{2x+1}{x^4}\right)$ $x = -\frac{1}{2}$, $x = 0$



Definiční obor

Funkce je konvexní na intervalu $\langle -\frac{1}{2}, 0)$ a na $(0, \infty)$
konkávní na intervalu $(-\infty, -\frac{1}{2}\rangle$