

Pr Průběh funkce

LS 2014/2015
 vol A
 Průběh křiv

$$f(x) = (x+2) e^{1-x}$$

0) f men' saka' ani lida' $\left[\frac{f'(x)}{f(x)} \right]$

1) $D_f = \mathbb{R}$

2) lamiy a bojnich bodecl D_f

$$\lim_{x \rightarrow +\infty} (x+2) e^{1-x} = \lim_{x \rightarrow +\infty} \frac{(x+2)}{e^{x-1}} \stackrel{\frac{\infty}{\infty}}{=} \lim_{x \rightarrow +\infty} \frac{1}{e^{x-1}} = 0$$

f ma' asymptote
 $x \rightarrow +\infty$ $y = 0$

$$\lim_{x \rightarrow -\infty} (x+2) e^{1-x} \stackrel{\text{VOAL}}{=} \left(\lim_{x \rightarrow -\infty} (x+2) \right) \left(\lim_{x \rightarrow -\infty} e^{1-x} \right) = (-\infty) \cdot (+\infty) = -\infty$$

3) prusecky a osomi

$P_y = [0, 2e]$
 23
 5.4

$P_x: (x+2) e^{1-x} = 0$
 $x+2 = 0$
 $x = -2$

$P_x = [-2 | 0]$

4) Asymptoly

$x \rightarrow -\infty$:

$$\lim_{x \rightarrow -\infty} \frac{f(x)}{x} = \lim_{x \rightarrow -\infty} \frac{x+2}{x} e^{1-x} \stackrel{\text{VOAL}}{=} \left(\lim_{x \rightarrow -\infty} \frac{x+2}{x} \right) \left(\lim_{x \rightarrow -\infty} e^{1-x} \right) = 1 \cdot (+\infty) = +\infty$$

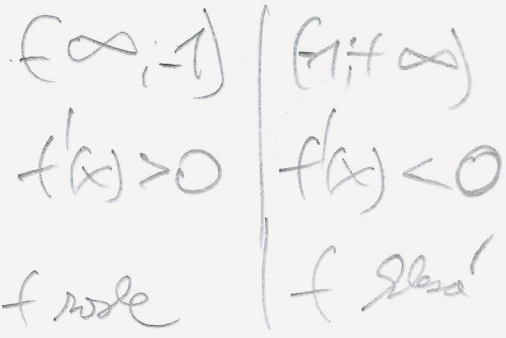
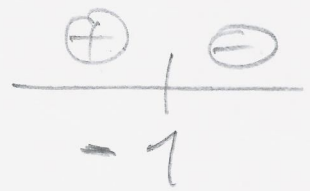
\Rightarrow f nema' asymptote $x \rightarrow -\infty$

5) první derivace

$$f'(x) = e^{1-x} + (x+2)e^{1-x}(-1) =$$

$$= (-x-1)e^{1-x} \quad D_{f'} = \mathbb{R}$$

6)



↓ OED_f

f má v bodě $x_0 = -1$
 lokální maximum
 $f(-1) = e^2 = 2,7^2 \approx 7,4$

7) lokální extrém

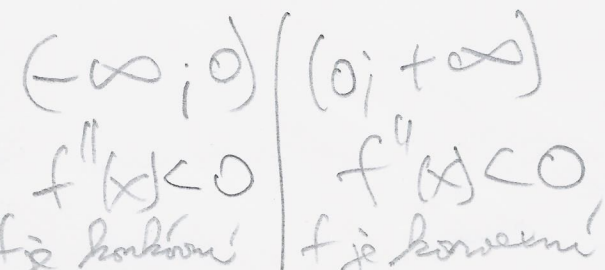
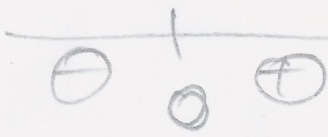
8) druhá derivace

$$f''(x) = -e^{1-x} + (-x-1)e^{1-x}(-1) =$$

$$= e^{1-x}(-1+x+1) = e^{1-x} \cdot x$$

$D_{f''} = \mathbb{R}$

9) konvexitel/konkávost



OED_f, 0 je inflexní bod

10) glob

11) oba hodnot

$$H_f = (-\infty; 7.4]$$

12) globální extémy

f má globální maximum

v bodě $x_0 = -1$

$$f(-1) = 7.4$$

