

bil. 30

$$f(x) = \ln x, \quad g(x) = -\ln x$$

$$\begin{aligned}
 a) \quad \ln x &= -\ln 9x \\
 \ln x + \ln 9x &= 0 \\
 \ln(x \cdot 9x) &= 0 \\
 \ln(9x^2) &= 0 \\
 \ln(9x^2) &= \ln 1
 \end{aligned}$$

$$\begin{aligned}
 9x^2 &= 1 \\
 x^2 &= \frac{1}{9} \quad x_1 = \frac{1}{3}, \quad x_2 = -\frac{1}{3}
 \end{aligned}$$

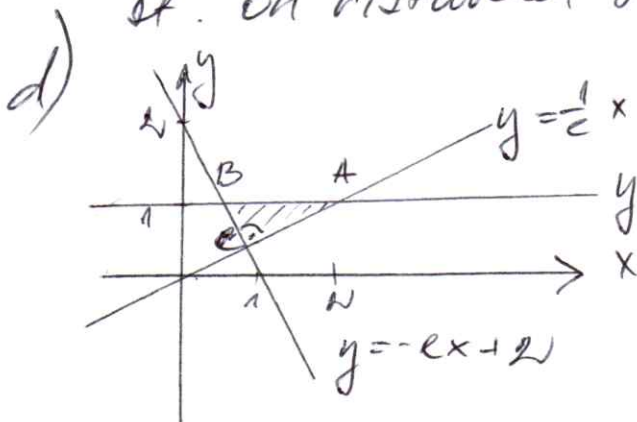
Kontrolli.

$$\begin{aligned}
 I) \quad y &= f(x) \quad P(e; y) \\
 y' &= \frac{1}{x} \quad k_1 = f'(e) = \frac{1}{e} \\
 f(e) &= \ln e = 1 \\
 \text{Punktepunkt } P_1 &(e; 1) \\
 y - 1 &= \frac{1}{e}(x - e) \\
 \underline{y} &= \frac{1}{e}x
 \end{aligned}$$

$$\begin{aligned}
 II) \quad y &= g(x) \quad P\left(\frac{1}{e}; y\right) \\
 y' &= -\frac{1}{x} \quad k_2 = g'\left(\frac{1}{e}\right) = -e \\
 g\left(\frac{1}{e}\right) &= -\ln \frac{1}{e} = -\ln e^{-1} \\
 &= \ln e = 1 \\
 \text{Punktepunkt } P_2 &\left(\frac{1}{e}; 1\right) \\
 y - 1 &= -e\left(x - \frac{1}{e}\right) \\
 y &= -ex + 1 + 1 \\
 \underline{y} &= -ex + 2
 \end{aligned}$$

$$c) \quad k_1 \cdot k_2 = \frac{1}{e}(-e) = -1$$

st. on ristunud sirged



$$\begin{aligned}
 \text{Punkti A koordinaadid} \\
 \begin{cases} y = 1 \\ y = \frac{1}{e}x \end{cases} \Rightarrow A(e; 1) \\
 \text{Punkti B koordinaadid} \\
 \begin{cases} y = 1 \\ y = -ex + 2 \end{cases} \Rightarrow B\left(\frac{1}{e}; 1\right) \\
 \text{Punkti C koordinaadid} \\
 \begin{cases} y = \frac{1}{e}x \\ y = -ex + 2 \end{cases} \Rightarrow C\left(\frac{2e}{1+e^2}; \frac{2}{1+e^2}\right)
 \end{aligned}$$

Piki'm ühik AB (täisnurkse vastas)

$$\text{Leia ise! } AB = \frac{e^2 - 1}{2} \quad S = \frac{AC \cdot BC}{2} = \frac{(e^2 - 1)^2}{2e(1 + e^2)} \approx 0,895^2$$

Kahe punkti vahelise kauguse valem.