

$$50^x > x^{50}$$

Om $x = 50$ så $50^x = x^{50}$

Överkurs

Logaritmera: $x \cdot \ln 50 \stackrel{?}{=} 50 \ln x$

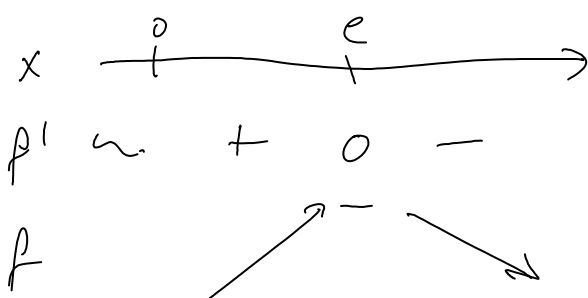
"Fixa till"

$$\frac{\ln 50}{50} \stackrel{?}{=} \frac{\ln x}{x}$$

Studera funktionen $f(x) = \frac{\ln x}{x}$:

$$f'(x) = \frac{\frac{1}{x} \cdot x - \ln x}{x^2} = \frac{1 - \ln x}{x^2} = 0 \Leftrightarrow x = e$$

Teckenstudium



Alltså $\frac{\ln x}{x}$ avtagande då $x > e$ så

Alltså $\frac{\ln x}{x}$ avtagande då $x > e$ så

$$x^{50} < 50^x \quad \text{om} \quad x > 50$$

$$50^x < x^{50} \quad \text{om} \quad e < x < 50$$

$$50^2 < 2^{50}$$

$$50^1 < 1^{50}$$

$$50^x < x^{50}$$

$$1 < x < 50$$

Alltså $x > 50$!