

$$= \frac{200}{m\bar{u}} \left(1 - \underbrace{\cos m\bar{u}}_{(-1)^n} \right) = \begin{cases} \frac{400}{m\pi}, & n \text{ paritar} \\ 0, & n \text{ parik.} \end{cases}$$

$$\text{Süß } u(x, t) = \frac{400}{\pi} \sum_{n=1,3,5,\dots}^{\infty} \frac{1}{n} \sin \frac{m\bar{u}x}{10} e^{-\lambda_n^2 t}$$

$$\text{misses } \lambda_n = \frac{cm\bar{u}}{L} \Rightarrow \lambda_n^2 = \frac{1 \cdot 14 \cdot \pi^2}{100} n^2 \\ \approx 0.1125 n^2$$

1b) 1. term:

$$u(x, t) \approx \frac{400}{\pi} \sin \frac{\pi x}{10} e^{-\lambda_1^2 t}$$

$$u(x, t) = 10 \quad \text{pisteeaar } x = 5 \Rightarrow$$

$$\frac{400}{\pi} \underbrace{\sin \frac{\pi}{2}}_1 e^{-\lambda_1^2 t} = 10$$

$$\Rightarrow e^{-\lambda_1^2 t} = \frac{\pi}{40}$$

$$\Rightarrow -\lambda_1^2 t = \ln \frac{\pi}{40} \Rightarrow$$

$$t = \frac{-\ln \frac{\pi}{40}}{\lambda_1^2} \approx \underline{\underline{22.6 \text{ s}}}$$