

Answers to problem set 2
FYS4130 at UiO, Spring 2012

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2.6

a) $\rho(x, t = 10 \text{ s}) = \cos(10x)e^{-1}$

b) $t_0 = 5 \cdot 10^2 \text{ s}$

c) C

2.7

a) $\rho(x, t) \approx \frac{1}{\sqrt{4\pi Dt}} e^{-x^2/(4Dt)}$

b) $\rho(x, t) \approx \frac{1}{L} + \frac{2}{L} \cos\left(\frac{2\pi}{L}x\right) e^{-D\left(\frac{2\pi}{L}\right)^2 t}$

c) $\tau = \frac{L^2}{2D}$

2.9

a) -

b) -

c) $t = \frac{c_p \rho (\Delta x)^2}{2k_t}$