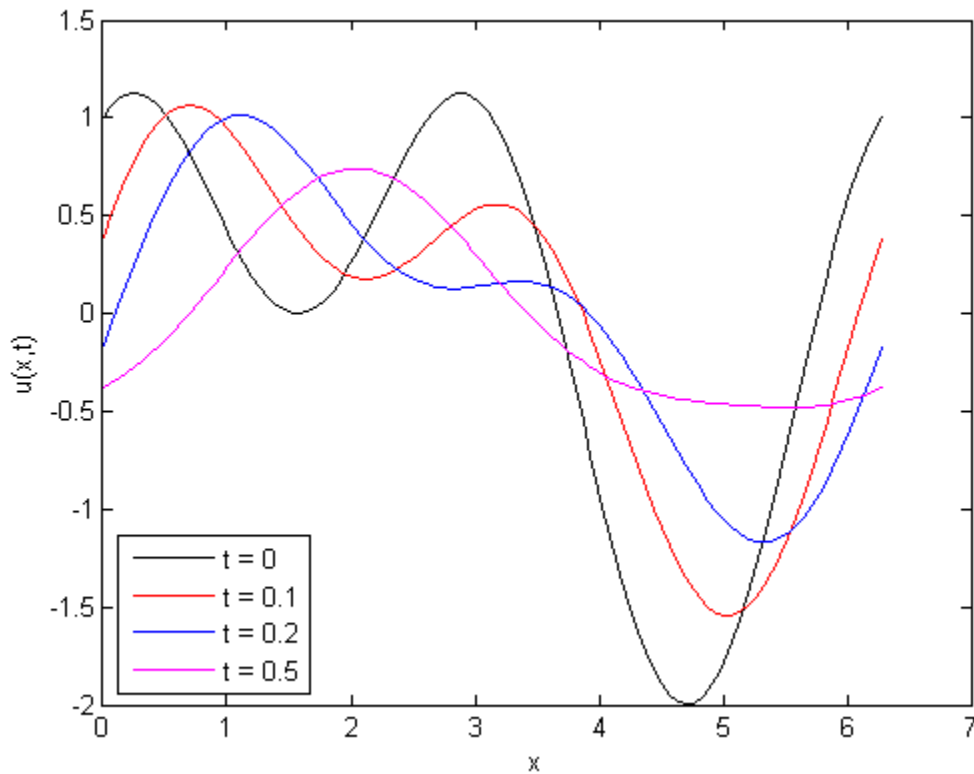


Solutions

Prob 1

$$u(x, t) = e^{-t} \sin(x-t) + e^{-4t} \cos(2x-8t)$$

Plot:



Prob 2

$$u(x, t) = \left(1 + \frac{t^2}{2}\right) + e^{-\pi^2 t} \cos(\pi x) + \left[e^{-4\pi^2 t} + \frac{e^{-t} - e^{-4\pi^2 t}}{4\pi^2 - 1}\right] \cos(2\pi x)$$

Prob 3

$$u(x, t) = 3 + t + \frac{3}{2} \cos(x-t) + \frac{1}{2} \sin(x-t) - \frac{1}{2} e^{-t} [\cos(x) + \sin(x)]$$