

MAE 502, Spring 2019 HW6 solution

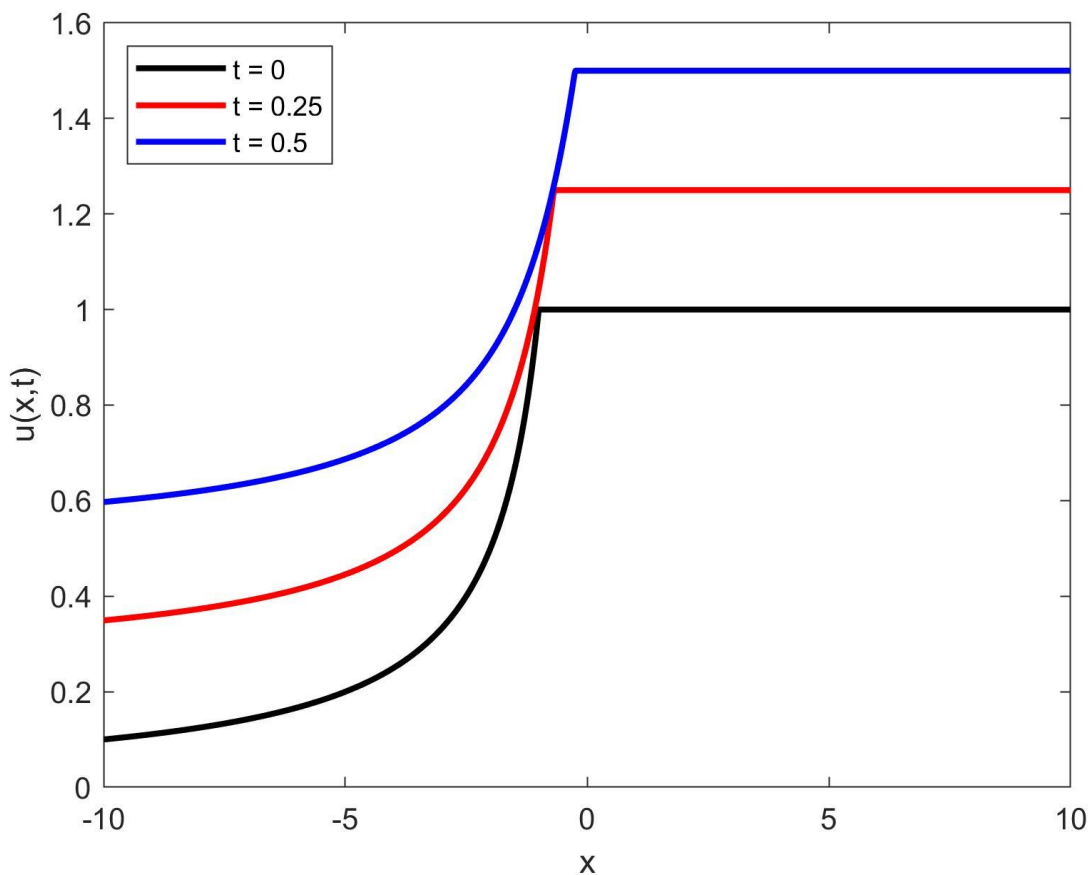
Prob 1

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

Prob 2

$$u(x, t) = \begin{cases} \frac{-2}{(x-t^2) - \sqrt{(x-t^2)^2 + 4t}} + t, & \text{if } x - t - t^2 \leq -1 \\ 1+t, & \text{if } x - t - t^2 > -1 \end{cases}$$

Plot:



Prob 3

$$u(x, t) = e^{-(x-t)^2} + e^t - t - 1$$

Prob 4

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