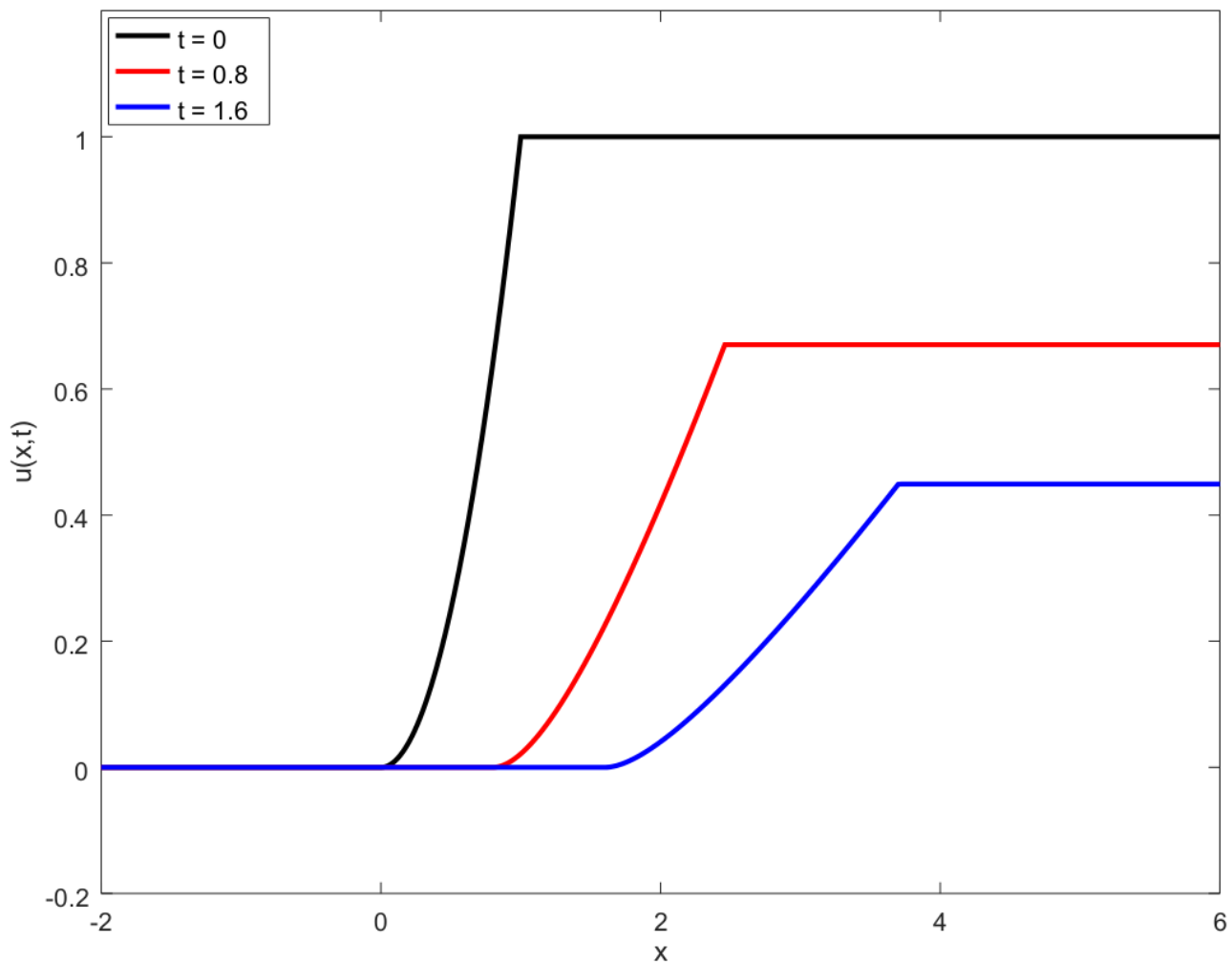


MAE/MSE502 Spring 2018 HW6 solution

Task 1

$$\begin{aligned} u(x,t) &= 0, \text{ if } x < t \\ &= \left( \frac{-1 + \sqrt{1 - 8(1 - e^{-0.5t})(t-x)}}{4(1 - e^{-0.5t})} \right)^2 e^{-0.5t}, \text{ if } t \leq x \leq 1+t+2(1 - e^{-0.5t}) \\ &= e^{-0.5t}, \text{ if } x > 1+t+2(1 - e^{-0.5t}) \end{aligned}$$

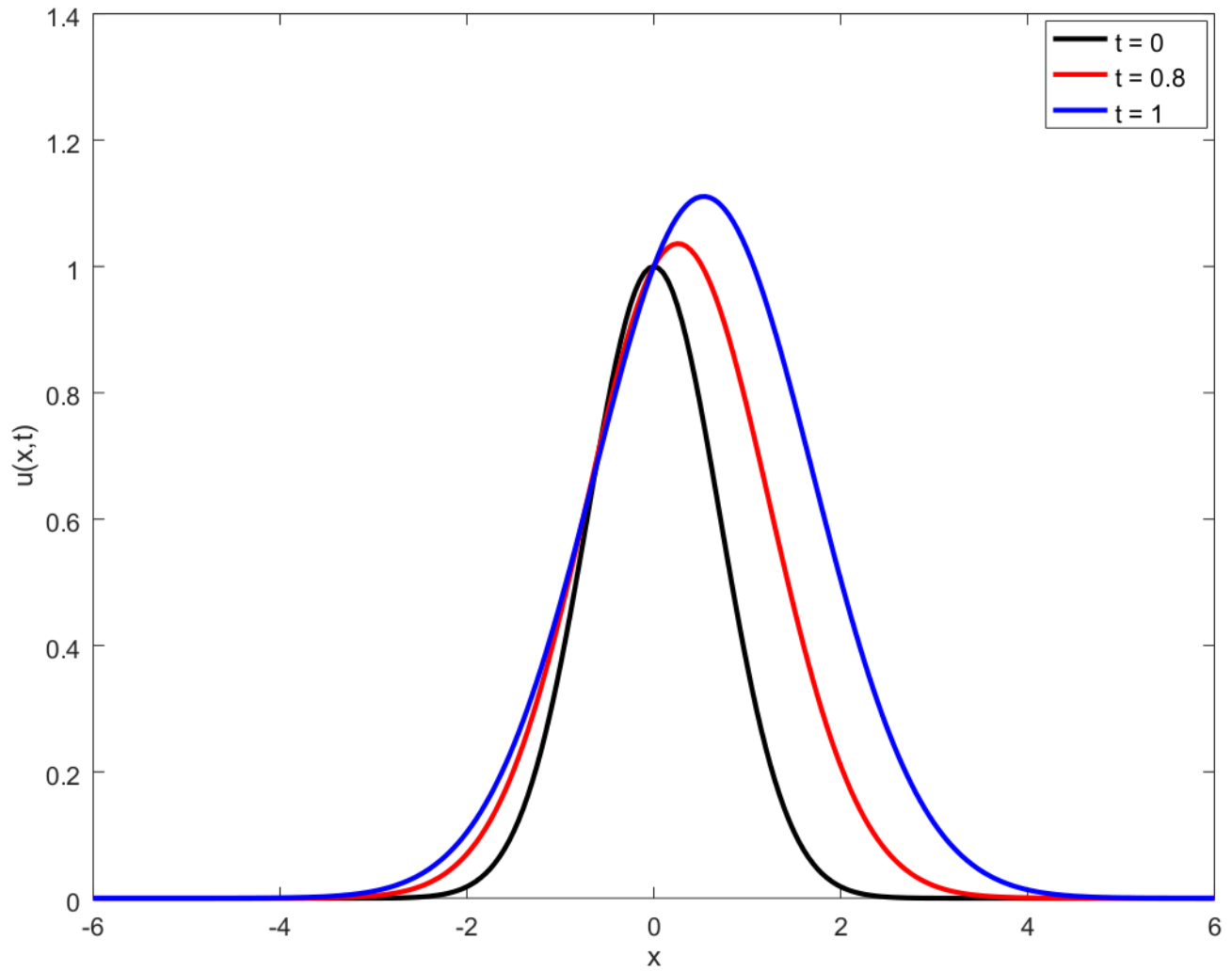
Plot:



## Task 2

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

Plot:



### Task 3

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

Plot:

