

MAE/MSE 502, Fall 2019, HW5 Solution

Prob 1

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

Prob 2

$$u(x, t) = t^2 - x + \frac{2\left(x - \frac{t^3}{3}\right)}{1+2t}$$

Prob 3

$$u(x, t) = \left\{ e^{-\left(\frac{x+1}{(t+1)^2-1}\right)^2} + 1 \right\} (t+1)^3 - 1$$

Prob 4

$$u(x, t) = \begin{cases} 1 + 3t, & \text{if } x > -1 + t + 2t^2 \\ \frac{2}{(2t^2 - x) + \sqrt{(2t^2 - x)^2 + 4t}}, & \text{if } x \leq -1 + t + 2t^2 \end{cases}$$

Plot:

