

MAE/MSE 502, Spring 2020 HW4 Solution

Prob 1

$$u(x, t) = 100(1 - e^{-t}) + \left(1 + \frac{t^2}{2}\right) e^{-\pi^2 t} \cos(\pi x)$$

Prob 2

$$u(x, t) = \cos(2x) + \cos\left(\frac{x}{2}\right) e^{\frac{15}{4}t}$$

Prob 3

$$u(x, t) = 8080 \left(e^{\frac{t}{4}} - 1\right) + 2 \cos\left(\frac{x}{2}\right)$$

Prob 4

$$u(x, t) = 3 \cosh(2t) - 2 + \frac{1}{\sqrt{3}} \sinh(\sqrt{3} t) \cos(x) + \frac{t^3}{6} \sin(2x)$$