

MAE/MSE 502 Spring 2021 HW4 Solution

Problem 1

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

Problem 2

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

Problem 3

$$u(x, t) = \frac{t^3}{6} + [1 - \cos(t)] \sin(x) + \frac{1}{12} [\cosh(\sqrt{12} t) - 1] \cos(2x)$$

Problem 4

$$u(x, t) = \cos\left(\frac{x}{4}\right) \exp\left(\frac{15}{16} t\right) + 2 \cos(x) + \sin(x)$$