QUIZ 2

Each question is worth 10 points. Please write detailed mathematically correct solutions.

You do not have to check the Wronskian in any of the problems.

1. Find the *general* solution of the DE

$$t^2y'' - ty' + y = 0$$

given that one of the solutions is $y_1(t) = t$

2. Find the *general* solution of

$$y'' + y' = 2e^t + 2t$$

3. For the following DE

$$y'' + y' - 2y = 0$$

(1) Find the *general* solution.

(2) What is $\lim_{t\to\infty} y(t)$ as a function of the constants in your general solution?

4. For the following DE

$$y'' + y = 0$$

(1) Solve the IVP for the following initial conditions:

(a) $y(0) = 1, y'(0) = 0$

(b) $y(0) = 0, y'(0) = 1$

(c) $y(0) = 1, y'(0) = 1$

(2) Draw the graphs of the above solutions, as best as you can.