1. Classify and then find the general solution to the following ODE:

$$y' = -2y + 2xe^{-2x}$$

$$y'' + 6y' + 9y = 0$$

1. Classify and then find the general solution to the following ODE:

$$y' = 5y + 2xe^{5x}$$

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

1. Classify and then find the general solution to the following ODE:

$$y' = 3y + 2xe^{3x}$$

$$y'' - 4y' + 4y = 0$$

1. Classify and then find the general solution to the following ODE:

$$y' = -8y + 2xe^{-8x}$$

$$y'' + 10y' + 25y = 0$$