WRITTEN HOMEWORK 3

This homework will be due on Thursday April 23rd.

Question 1. Find the general solution of the linear equation
$$y' + y = e^{-x}$$

Question 2. Solve the initial value problem
$$\begin{cases} y' + \frac{y}{x} = \frac{e^x}{x} \\ y(1) = 3 \end{cases}$$

Question 3. Find the general solution of the linear equation
$$xy' - y = x^3$$

Question 4. Find the general solution of the Bernoulli equation
$$y' + \frac{y}{x} = xe^x y^2$$

Question 5. Find the general solution of the Bernoulli equation
$$y' + xy = 6x\sqrt{y}$$

Question 6. Solve the initial value problem
$$\begin{cases} y' + \frac{2}{x}y = -x^9 y^5 \\ y(-1) = 2 \end{cases}$$