Homework Day 13 - ECON 186

Problem 1. Sketch the direction field of the differential equation $\frac{dv}{dt} = 9.8 - 0.196v$

Problem 2. Consider the differential equation

$$\frac{dy}{dt} = 20 + 2y$$

a. Classify the differential equation (order? homogeneous or nonhomogeneous? linear or nonlinear?)

b. Find the general solution of the differential equation.

c. Find the particular solution with the initial condition $y(0) = 3$.

Problem 3. Find the general solution of the following differential equation

$$\frac{dy}{dt} + \frac{1}{t}y - 2 = 3t + t^2 \qquad where\ t \geq 0$$

Problem 4. Solve the following initial value problem.

$$y' = e^{-y}(2x - 4) \qquad y(5) = 0$$