HW2 (Integrating Factor, Homogeneous, Bernoulli, Riccati Equations)

1. Consider $y - xy' = 0$.
   a. Show that this equstion is not exact on any rectangle.
   b. Find an integrating factor $\mu(x)$ that is a function of x alone.
   c. Find an integrating factor $\upsilon(x)$ that is a function of y alone.
   d. Show that there is also an integrating factor $\eta(x, y) = x^a y^b$ for some constant a and b. Find all such integrating factor.
   (Page 39, Problem 3.)

2. Find the general solution. These problems include all types considered in this section.
   a. $y' + xy = xy^2$ (Page 46, Problem 3.)
   b. $(x - 2y)y' = 2x - y$ (Page 46, Problem 7.)
   c. $y' = -e^{-x}y^2 + y + e^x$ (Page 46, Problem 13.)