Math 366, Spring 2013, Quizz 1

NAME:

1. For each of these differential equations, tell whether it is separable, homogeneous, linear, exact or none of the above.

   a) \( e^y \frac{dy}{dx} = x + x^3, \)
      Separable.

   b) \( 3y + e^x + (3x + \cos y) \frac{dy}{dx} = 0, \)
      Exact.

   c) \( xdy + (y + y^2 \log x)dx = 0, \)
      None.

   d) \( (x^2 + y^2)dy + x(x + y)dx = 0, \)
      Homogeneous.

   e) \( (x^2 + 1) \frac{dy}{dx} + 3xy = 6e^x. \)
      Linear.

2. Solve \( y' = e^{x-y}x. \)

   \[ e^y dy = e^x dx, \quad e^y = e^x + C, \quad y = \log(e^x + c). \]