1. (6 points) Which of the following differential equations has the slope field given in the figure? (Circle the letter of each correct answer.)

   a. \( \frac{dy}{dx} = \frac{2x}{1+x^2} \)   b. \( \frac{dy}{dx} = e^{-y^2} \)   c. \( \frac{dy}{dx} = \frac{2x^2}{1+x^4} \)

   ![Slope Field Image]

   d. \( \frac{dy}{dx} = \frac{2y}{1+y^2} \)   e. \( \frac{dy}{dx} = e^{-x^2} \)   f. \( \frac{dy}{dx} = \frac{2y^2}{1+y^4} \)

2. (8 points) Circle “True” or “False” for each of the following statements. No explanation is necessary. (Remember that “True” means the statement is always true.)

   (a) The function \( y(t) = 0 \) is an equilibrium solution of the differential equation \( \frac{dy}{dt} = y + t \).

   True.   False.

   There is no constant \( y_0 \) such that \( \frac{dy}{dt} - y + t = 0 \) for \( y = y_0 \) and all \( t \), so there is no equilibrium solution of the equation.

   (b) If \( P(t) \) is a solution of the logistic differential equation, \( \frac{dP}{dt} = .5P(200 - P) \), then so is the function \( 2P(t) \).

   True.   False.

   The constant function \( P(t) = 200 \) is a solution of the equation, but \( 2P(t) \) is not.