Remember that quizzes are based on random problems from this worksheet. Please endeavor to work through these problems before the end of each discussion.

1. Solve the differential equation.
   a) \((y + \sin y)y' = x + x^3\).

2. Find the solution of the differential equation that satisfies the given initial condition:
   a) \(\frac{dy}{dx} = \frac{x}{y}, \quad y(0) = -3\).
b.) \( \frac{dp}{dt} = \sqrt{pt} \), \( p(1) = 2 \).

c.) Find the equation of the curve that passes through the point \( (0,1) \) and whose slope at \( (x,y) \) is \( xy \).
3. A tank contains 1000 L of brine with 15 kg of dissolved salt. Pure water enters the tank at a rate of 10 L/min. The solution is kept thoroughly mixed and drains from the tank at the same rate. How much salt is in tank
a.) after \( t \) minutes

b.) after 20 minutes.