1. Find general solutions of the differential equations.

1. \( \frac{dy}{dx} = (2x + y)^2. \)
   
   *Hint.* Try \( u = 2x + y. \)

2. \( xyy' = x^2 + 3y^2. \)
   
   *Hint.* Try \( u = y^2. \)

3. \( xy' + 1 = e^y. \)
4. \( y' \cos y + \sin y = x + 1 \)

2. Solve the homogeneous equations (the standard substitution in this case is \( u = \frac{y}{x} \)).
   a) \( (x + 2y)y' = y \)

   b) \( (x^2 - y^2)y' = 2xy. \)

3. Solve the Bernoulli equation (the standard substitution in this case is \( u = y^{1-n} \)).
   \( y^2y' + 2xy^3 = 6x. \)