(1) Verify that \( y = 2 + c e^{-2x^2} \) is one parameter family of solutions of the differential equation \( y' + 4xy = 8x \).

(2) Find values of \( m \) so that the function \( y = x^m \) is solution of differential equation \( x^3 y''' + 5x^2 y'' + 7x y' + 8y = 0 \).

(3) Determine a region in which differential equation \( y' = \sqrt{\frac{y^2 - 9}{x^3}} \) has a unique solution through the point \((x_0, y_0)\).