(1) Find values of $m$ so that the function $y = x^m$ is solution of differential equation

$$x^3 y''' + 5x^2 y'' + 7x y' + 8y = 0.$$ 

(2) Determine a region in which differential equation $y' = \sqrt{\frac{x^2-4}{x}}$ has a unique solution through the point $(x_0, y_0)$.

(3) Solve the differential equation $dy + x^2 dx = x^2 e^{3y} dx$. 