(1) Find the n-th Picard's iterate y_n for the following IVP: $y' = x^2 + y, \ y(0) = 0$.

(2) Apply the Picard's iteration method to $y' = 2y^2, \ y(0) = 1$.

(3) Consider the IVP:
$$(x^2 - 1)y' = 4y, \ y(x_0) = y_0.$$

    (a) Find the values of (x_0, y_0) for which a unique solution is guaranteed by the existence-uniqueness theorem.

    (b) Show that if $(x_0, y_0) = (1, 0)$, then the IVP has infinitely many solutions.

(4) Find all the initial conditions, such that corresponding IVP, with the ODE
$$(x^2 - 4x)y' = (2x - 4)y$$

has no solution, a unique solution and more than one solution, respectively.