Name: ID #:   Section #:

Q1) **[5pts]**

     (a) Find a one-parameter family of solutions of the ODE $x\dfrac{dy}{dx} = y^2 - y$.

     (b) Find a singular solution of the ODE in (a).

     <u>**Solution:**</u>

Q2) **[5pts]**

     (a) Solve the IVP $(x + 1)\dfrac{dy}{dx} + y = x\cos x, \quad y(0) = 5$.

        Give the largest interval I on which the solution is defined.

     (b) Is the solution in (a) unique on the interval I? Justify your answer.

     <u>**Solution:**</u>

Name: ID #:   Section #:

Q1) **[5pts]**

    (a) Find a one-parameter family of solutions of the ODE $x\dfrac{dy}{dx} = 4 - y^2$.

    (b) Find a singular solution of the ODE in (a).

Solution:

Q2) **[5pts]**

    (a) Solve the IVP $(x - 1)y' + y = x \sin x, \quad y(0) = 2$.

       Give the largest interval I on which the solution is defined.

    (b) Is the solution in (a) unique on the interval I? Justify your answer.

Solution: