Name: ID #: Section #:

Q1) Determine a region in the xy-plane for which the differential equation $(1+y^3)y' = x^2$ would have a unique solution whose graph passes through a point (x_0, y_0) in the region. **(2 points)**

Q2) Solve $\dfrac{dy}{dx} = \dfrac{xy + 2y - x - 2}{xy - 3y + x - 3}$. **(3.5 points)**

Q3) Solve the initial value problem $y\dfrac{dx}{dy} - x = 2y^2, \;\; y(1) = 5$. **(4.5 points)**

Name: ID #: Section #:

Q1) Determine a region in the xy-plane for which the differential equation $(y-x)y' = y+x$ would have a unique solution whose graph passes through a point (x_0, y_0) in the region. **(2 points)**

Q2) Solve the initial value problem $\dfrac{dy}{dx} = \dfrac{y^2-1}{x^2-1}, \quad y(2) = 2.$ **(4 points)**

Q3) Solve $(1+x)\dfrac{dy}{dx} - xy = x + x^2.$ **(4 points)**