Math 202-Section 11 Quiz 3
Return the Quiz at my Office 5-407 by 5:00pm today

Sr. Num.: ID. Num.: Name:

Q: Consider the following initial value problem (IVP):

$$\begin{aligned} dy + 4x^3 y dx &= 0, \\ y(0) &= b, \end{aligned}$$

where b is a constant.

(1) (3 points) Use the existence and uniqueness theorem to find all values of b making the IVP to have a unique solution.

(2) (3 points) For $b = -1$, solve the IVP using the fact that the differential equation is separable.

(3) (3 points) Again for $b = -1$, solve the IVP using the idea of integrating factor for first order, linear differential equations.

(4) (2 points) Show that the above differential equation is not exact.

(5) (3 points) Find an integrating factor that makes the differential equation exact.

(6) (3 points) Find the general solution of the differential equation, using the method for exact differential equations.

Q (3 points) Find a first order, linear initial value problem whose solution is

$$x = e^y.$$