

Math 202-171 Quiz 2.

Name_____ Section__ Serial #__ Id_____

Q1:a) Find an integrating factor for the equation

$$dy + (x^2y - \sin x)dx = 0$$

b) Find a differentiable function that makes the differential equation $3[f(x) + x^2] \sin 3y dx + (e^{3x} + \frac{x^3}{3} + x)\cos 3y dy = 0$

exact.

Q2: a) What substitution would you use for the equation

$$y^{-\frac{3}{2}} \frac{dy}{dx} + x^2 y^{-\frac{1}{2}} = x^2 + 1.$$

Use this substitution to change the equation to linear first order equation .

b) Identify the type of the equation $\frac{dy}{dx} = \frac{x^4}{y^2(x^2+y^2)}$ and write down the substitution you will use to change it to a seperable equation.

Q3) A body of temperature $100^\circ C$ is put in a room of temperature $25^\circ C$. If it takes the body 15 minutes to cool down to $70^\circ C$, after how much time will the temperature of the body reach $40^\circ C$

(You can write your answer in terms of the log function).