Math 285 Quiz 1 Version B

1. Solve the given differential equation by separation of variables

$$\frac{dy}{dx} = e^{5x+3y}$$

to find the general solution.

Math 285 Quiz 1 Version B

2. Find the solution of the linear differential equation

$$\begin{cases} \dfrac{dy}{dx} + y = e^{3x} \\ y(0) = 5. \end{cases}$$

3. Determine whether the given differential equation is exact. If it is exact solve it; if it is not exact, write NOT and explain why.

$$(2xy^2 - 5)dx + (2x^2y + 4)dy = 0$$

Math 285 Quiz 1 Version B

4. Solve the given differential equation by finding an appropriate integrating factor.

$$4xy\,dx + (4y + 6x^2)dy = 0$$

5. Solve the homogeneous differential equation by using an appropriate substitution.

$$(y^2 + yx)dx - x^2 dy = 0.$$

6. Solve the given initial-value problem. This is a Bernoulli equation.

$$\begin{cases} x^2 \dfrac{dy}{dx} - 2xy = 5y^4 \\ y(1) = \dfrac{1}{3} \end{cases}$$

7. Draw a phase portrait and solution curves for the autonomous first-order ordinary differential equation $y' = y^3 - 5y$ below.