King Fahd University of Petroleum and Minerals
Quiz 2 Math 202-131 Duration 25 minutes

Full Name:
ID:
Serial number:

Question 1. Solve the IVP: $(y\,\mathrm{e}^{xy} + \frac{1}{\sqrt{4-x^2}})dx + (x\mathrm{e}^{xy} - 2y)dy = 0$ with $y(0) = 0$.

Question 2. Find an appropriate integrating factor that allow you to convert $y(x + y + 1)dx + (x + 2y)dy$ into an exact DE.

Question 3. Determine the type of the DE: $(x + ye^{y/x})dx - xe^{y/x}dy = 0$, and then convert it into a separable DE by using an appropriate substitution.

Question 4. Solve the DE:

$$\cos x \frac{dy}{dx} + y \sin x = -2y^2 \tan x \sin x.$$

Hint: First, you may first need to use a suitable substitution to convert this DE into a linear one.