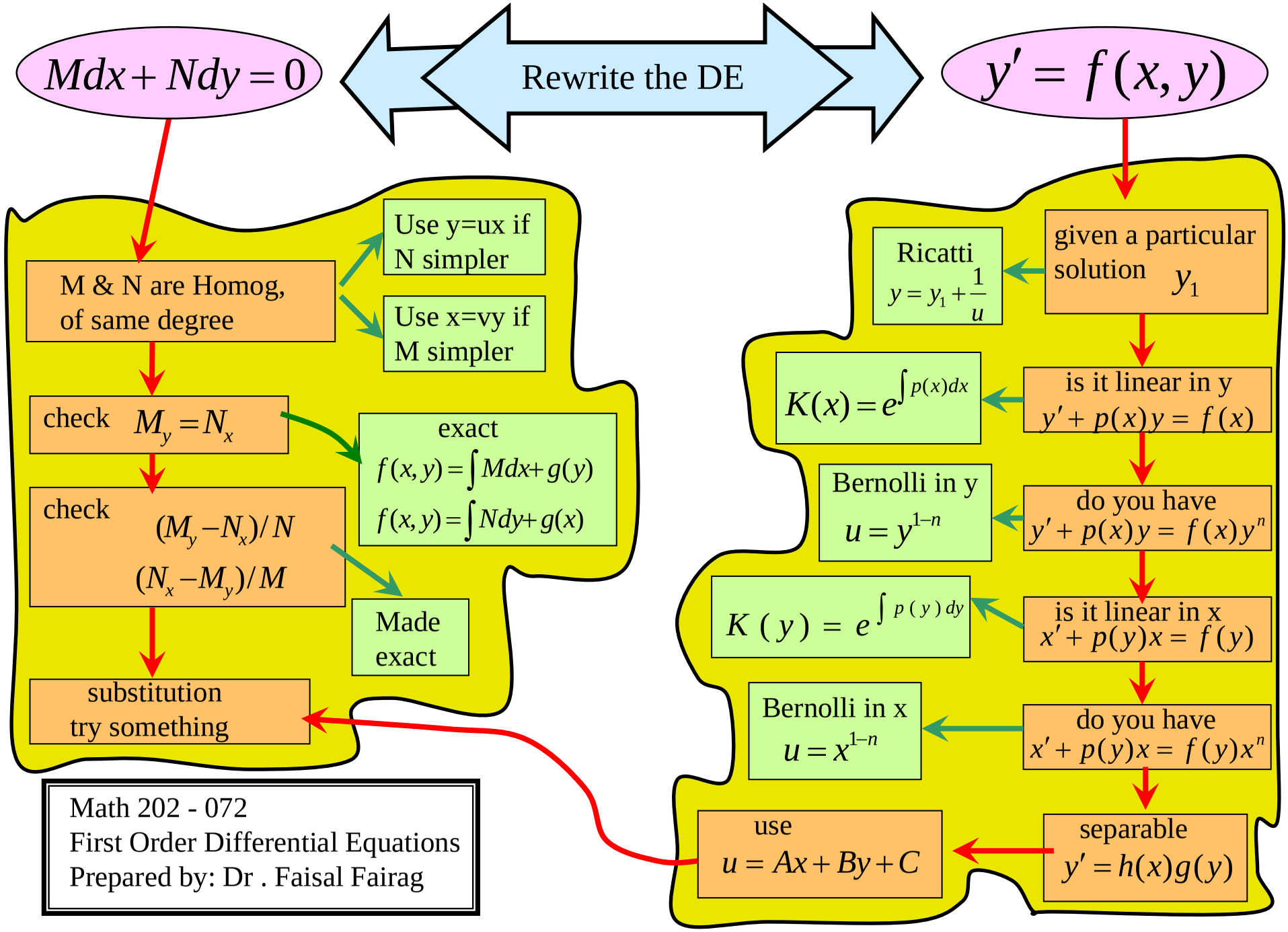
King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences
Math 202 Exam II
Semester II, 2008- (072)
Dr. Faisal Fairag

Serial NO:		
ID:		
Name:		FORM **B**

Q		Points
1		20
2		20
3		30
4		15
5		15
6		30
Bonus		20
Total		130

(You are an A+ student when you believe you are an A+ student)

Say a prayer & Good luck



Math 202 - 072
First Order Differential Equations
Prepared by: Dr . Faisal Fairag

1) Consider the DE

$$y' = -4x^{-2} - x^{-1}y + y^2 \qquad (*)$$

Given that $y_1 = -2x^{-1}$ is a known solution of the equation (*). Transform the equation (*) into a linear DE. (DONOT SOLVE THE DE ONLY TRANSFORM IT INTO LINEAR)

2) Consider the DE

$$xdx + x^2 ydy = -4ydy \qquad (*)$$

Find an appropriate integrating factor K so that if we multiply the equation (*) by K then the new equation become an exact.

(DONOT SOLVE THE DE)

3) Solve $(4x^3y - 15x^2 - y)dx + (x^4 + 3y^2 - x)dy = 0$

4) Consider the DE $x'(1+e^{y-x+5})=1$ (*)

We can solve (*) by transforming (*) into a _____ differential equation if we use the following substitution _____.

5) Consider the DE $x(x-y)y'=1$ (*)

We can solve (*) by transforming (*) into a _____ differential equation if we use the following substitution _____.

6) Solve the IVP:

$$y(\ln x - \ln y)dx = (x\ln x - x\ln y - y)dy$$
$$y(e) = e$$

Bonus) Consider the DE

$$(4x^5 + 4x^3y^2 - 2x^5 - 2xy^4)dx + (4y^3x^2 + 4y^5 - 2yx^4 - 2y^5)dy = 0 \qquad (*)$$

Find an appropriate integrating factor K so that if we multiply the equation (*) by K then the new equation become an exact.