KFUPM **Semester 142**

Dept. Math. & Stat. **A.Y:2014/2015**

Test 2 **Tuesday (February 24, 2015)**

Name:..... **ID:**.....

Exercise 1:

Show that the following DE

$$(e^{x\sin(y)}\sin(y))\mathrm{d}x + (2y + xe^{x\sin(y)}\cos(y))\mathrm{d}y = 0$$

is exact and solve it.

Solution:

Exercise 2:

Solve the following DE :

$$(xy)\mathrm{d}x + (\frac{3}{2}x^2 + y^2 - 1)\mathrm{d}y = 0$$

by finding an integrating factor.

Solution:

Exercise 3:

An object, initially at 75°F, is placed in a 475° F oven at 5 : 00 PM. After 75 minutes, it is found that the temperature of the object is 275° F. When will the object be at 375° F?

Solution:

Exercise 4:

Use an appropriate substitution to transform the given DE into a separable DE :

$$(x^4 - y^4)\mathrm{d}x + xy^3\mathrm{d}y = 0.$$