

Department of Mathematical Sciences  
KFUPM  
Term 042

**MATH 202/ Quiz#2/ Time allowed=50 minutes**

Name:

ID#:

**Q 1.** Show that the differential equation  $(5x^2 - xy + x^3 \sin x)dx + (x^2 + x^3y)dy = 0$  is not exact. Then find an integrating factor of the form  $u(x)$  and solve the equation.

**Q 2.** Show that the differential equation  $(x + y)dx + (y - x)dy = 0$  is homogeneous, and solve it.

**Q 3.** Solve the *IVP* :  $x^2 \frac{dy}{dx} + \frac{2}{x}y = \frac{1}{y^2}, y(1) = 0.$