

31 Jan, 2013
MATH 1005D

TEST 1

1. Solve the linear differential equation [5 marks]

$$(\cos x)y' + (\sin x)y = \sin x \cos^3 x$$

2. Consider the differential equation [15 marks]:

$$x^2 + y^2 + xyy' = 0$$

- (a) Show the equation is not exact.
- (b) Find an integrating factor to solve the equation as in-exact.
- (c) Use the integrating factor to solve the differential equation as in-exact.

3. Consider the differential equation [10 marks]:

$$\frac{y^2}{x^2} - y' = 0$$

- (a) Solve the equation as separable.
- (b) Solve the equation as Bernoulli.
- (c) Solve the equation as homogeneous. Your answer must be in **explicit form**.