HOMEWORK # 1

1. Use the method of homogenous equations to solve the following differential equation

$$(x^2 + 3y^2)dx - 2xydy = 0 \tag{1}$$

with $y(2)$=6.

2. Solve the following differential equation.

$$(6xy + 2y^2 - 5) + (3x^2 + 4xy - 6)\frac{dy}{dx} = 0 \tag{2}$$

3. Given that $f(x) = x$ is a solution of

$$(1 - x^2)y'' - 2xy' + 2y = 0 \quad \text{within} \quad -1 < x < 1 \tag{3}$$

find a second linearly independent solution.

4. Find the general solution of

$$y^{(4)} - 3y''' - 2y'' + 2y' + 12y = 0 \tag{4}$$

5. Solve the initial value problem

$$y'' - y' - 6y = 8e^{2x} - 5e^{3x} \quad \text{with} \quad y(0) = 3 \quad \text{and} \quad y'(0) = 5 \tag{5}$$

[0]Upload to NINOVA system before 22 March 2013