TOBB EKONOMİ VE TEKNOLOJİ ÜNİVERSİTESİ

MAK 501 ENGINEERING MATHEMATICS

FALL 2016

Due Date: 06.10.2016- Thursday* (08:30)

HOMEWORK 1

1. Solve the given differential equations.

a. $y' + 2y = x + e^{-3x}$

b. $y' + (1/x)y = 3\sin 2x, \quad x > 0$

c. $y' + \frac{2}{x}y = \frac{\sin x}{x^2}, \quad y(\pi) = 0, \quad x > 0$

2. Find the general solution for each of the given differential equations.

a. $y' + (1/x)y = \cos x, \quad x > 0$

b. $xy' + 2y = e^{3x}, \quad x > 0$

3. Find the solution of the given initial value problem. State the interval in which the solution is valid.

$xy' + 2y = 3\sin x, \qquad y(\pi) = 1/\pi$

4. In Exercises a and b, derive the general solution of the given equation by using an appropriate change of variables.

a) $\frac{\delta u}{\delta t} - 5\frac{\delta u}{\delta x} = 0$

b) $3\frac{\delta u}{\delta t} - \frac{\delta u}{\delta x} = 2$

5. In Exercises a and b, solve the given equation by the method of characteristic curves.

a) $\frac{\delta u}{\delta x} + x^3\frac{\delta u}{\delta y} = 0$

b) $\frac{\delta u}{\delta x} + \cos x\frac{\delta u}{\delta y} = 0$

Due date is **Thursday 6th of October, 2016**. For each day delay **15 points** will be reduced.

Technology Center: **Kasım Enes Kalın**