

KMU 237-21/22 ENGINEERING MATHEMATICS

HW-I (Due; 24.10.2017)

PROBLEMS

1. Determine the equations are linear or not linear, homogeneous or nonhomogeneous , and/or separable , and find the general solution.

a) $\frac{dy}{dt} = 3 - 2y$

b) $\frac{dy}{dt} = 3y + e^{7t}$

2. Solve the following differential equations

a) $\frac{dy}{dt} = \frac{ty}{1+t^2}$

b) $\frac{dy}{dt} = -5y + \sin 3t$

3. Solve the following differential equations

a) $\frac{dy}{dt} = \frac{t^2}{y+t^3y} \quad y(0) = -2$

b) $y' = \frac{xy^3}{\sqrt{1+x^2}} \quad y(0) = -1$

4. Find the general solution of the given differential equations

a) $\frac{dy}{dx} - \frac{3y}{x+1} = (x+1)^4$

b) $t^2y' + 2ty - y^3 = 0 \quad t > 0$

5. Solve the following differential equation

$$ty' - 2y = t^5 \sin(2t) - t^3 + 4t^4, \quad y(\pi) = \frac{3}{2}\pi^4$$

6. Solve $2y' + \frac{4}{x}y - 2(1+x^2) = 0$

7. Solve $x^3y' - x^2y = y^4 \sin 2x$