

Differential Equations B (APM8X11) – Homework 1

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1. For each of the following, state whether the PDE is linear or non linear and its order. If it is linear, state whether it is homogeneous or non homogeneous.

a. $yu_{xy} + u_y = xy$

b. $uu_{xx} + u_y^2 = 0$

c. $Au_{xx} + Bu_{xy} + Cu_{yy} + Du_x + Eu_y + Fu = G(x, y)$

d. $u_{xxx} + \ln u = 0$

2. From *Partial Differential Equations with Fourier Series and Boundary Value Problems* (by Nakhle H. Asmar), solve problems 1-8, page 5.
3. Using the same book, solve problems 11-14, page 6.