# CAAM 336 · DIFFERENTIAL EQUATIONS

## Homework 3

Posted Wednesday 28 August 2013. Due 5pm Wednesday 4 September 2013.

3. [25 points]
For each of the following equations, (a) specify whether it is an ODE or a PDE; (b) determine its order; and (c) specify whether it is linear or nonlinear. For those that are linear, specify whether they (d) are homogeneous or inhomogeneous; and (e) have constant or variable coefficients.

(1.1) $\dfrac{dv}{dx} + \dfrac{2}{x}v = 0$

(1.2) $\dfrac{\partial v}{\partial t} - 3\dfrac{\partial v}{\partial x} = x - t$

(1.3) $\dfrac{\partial u}{\partial t} - \dfrac{\partial}{\partial x}\left(2u\dfrac{\partial u}{\partial x}\right) = 0$

(1.4) $\dfrac{\partial u}{\partial t} + u\dfrac{\partial u}{\partial x} + \dfrac{\partial^3 u}{\partial x^3} = 0$

(1.5) $\dfrac{d^2y}{dx^2} - 7(1-y^2)\dfrac{dy}{dx} + y = 0$

(1.6) $\dfrac{d^2}{dx^2}\left(x^2\dfrac{d^2u}{dx^2}\right) = \sin(x)$