MATH4220 PDE – Quiz 1 (10 points)
February 18, 2016
(in class)

1. (5 points) For each of the following equations, state the order, type and whether it is nonlinear, linear inhomogeneous, or linear homogeneous:

(1) $\partial_t u - \partial_x^2 u + 1 = 0$

(2) $\partial_t^2 u - \partial_x^2 u + u^2 = 0$

(3) $\partial_{xy}^2 u = \sin(4x)$

(4) $2\partial_x^2 u + \partial_{xy}^2 u + \partial_y^2 u = 0$

2. (5 points) Solve the equation $\partial_x u + x\partial_y u = 0$ with the following two conditions:

(a) $u(0, y) = y^2$

(b) $u(x, 0) = x^2$