

MATH4220 PDE – Quiz 1 (10 points)
February 6, 2018

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

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

(2) $\partial_t u + 5u_x + u^2 = 0$

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

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

2. (5 points) Solve the linear equation

$$u_x + xu_y = 0$$

with the following conditions:

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

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