

Problem 3. (10 points)

Suppose that u is a real valued function of two variables.

(a) Find the integral curves for the vector field V given by

$$V(t, x) = \langle 1, 3t^2 \rangle.$$

(b) Find all solutions to the homogeneous problem

$$u_t + 3t^2 u_x = 0.$$

(c) Find all solutions to the inhomogeneous problem

$$u_t + 3t^2 u_x = x.$$