Summary of Lecture 21- 5/12/05 -PDEs

Solving first order PDEs using change of variables

- Suppose the dependent variable is z and independent variables are x, y i.e. we have a PDE involving z(x, y)
- if we change from x, y to u, v then the chain rule gives

$$\frac{\partial z}{\partial x} = \frac{\partial u}{\partial x} \frac{\partial z}{\partial u} + \frac{\partial v}{\partial x} \frac{\partial z}{\partial v}.$$

- We convert the equation involving x, y to one involving u, v. We now have a PDE involving z(u, v), we solve for z(u, v) and then back substitute to find z(x, y).
- The change of variable will always be given in this course.