

## Zagadnienia do ćwiczeń z równań różniczkowych cząstkowych:

1. Rozwiązywanie równań liniowych i quasilineary pierwszego rzędu:

- $x \frac{\partial u}{\partial x} - y \frac{\partial u}{\partial y} = 0,$
- $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} + \frac{z}{2} \frac{\partial u}{\partial z} = 0,$
- $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial z} = 0,$
- $\frac{\partial u}{\partial x} - (y + 2z) \frac{\partial u}{\partial y} + (3y + 4z) \frac{\partial u}{\partial z} = 0,$
- $(x^3 + 3xy^2) \frac{\partial u}{\partial x} + 2y^3 \frac{\partial u}{\partial y} + 2y^2 z \frac{\partial u}{\partial z} = 0,$
- $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = x,$
- $(x + z) \frac{\partial z}{\partial x} + (y + z) \frac{\partial z}{\partial y} = 0,$
- $y \frac{\partial z}{\partial x} - x \frac{\partial z}{\partial y} = x^3 y + xy^3,$
- $(y - z) \frac{\partial z}{\partial x} + (z - x) \frac{\partial z}{\partial y} = x - y,$
- $\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = z,$
- $2 \frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = y - x.$