

VZDROVA' PÍSOMKA 1

1. Najdite riešenie $u = u(x, y)$ eliptickej PDR
(4 body)

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 4(x^2 + y^2)^3,$$

ktore' má tvar $u(x, y) = f(r)$, kde $r = \sqrt{x^2 + y^2}$

2. Najdite riešenie $u = u(x, y, z)$ PDR

(4 body)

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

ktore' splňa podmienku

$$u(x, y, z) = 6x^2 + z^6$$

3. Najdite riešenie $u = u(x, y)$ PDR

(4 body)

$$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = x + y + u,$$

ktore' splňa

$$u(x, x+1) = 2x+1$$

4. Najdite všeobecne' riešenie $u = u(x, y)$ PDR

(3 body)

$$xm \frac{\partial u}{\partial x} + ym \frac{\partial u}{\partial y} = x^3 + y$$