Parcijalne diferencijalne jednačine
Drugi kolokvijum ~ 2013.

1. Rešiti mešoviti problem

$$u_{tt} - 6u_t = u_{xx} - 2u + 4x(t-3), \quad 0 < x < \frac{\pi}{2},\ t > 0$$
$$u_x(0,t) = 2t, \quad u\left(\frac{\pi}{2}, t\right) = \pi t, \quad t > 0\,,$$
$$u(x,0) = -6\sin 2x \sin x,\ u_t(x,0) = 1 + 2x - 2\cos^2\frac{3x}{2}, \quad 0 < x < \frac{\pi}{2}.$$

2. Rešiti mešoviti problem

$$u_t = u_{xx} + 4u_x, \quad 0 < x < l,\ t > 0$$
$$u_x(0,t) - h\,u(0,t) = u(l,t) = 0, \quad h > 0\,,$$
$$u(x,0) = f(x), \quad 0 < x < l.$$

3. Koristeći Poasonovu formulu za jedinični krug rešiti Dirihleov granični problem za PDJ

$$4\frac{\partial^2 u}{\partial x^2} + 9\frac{\partial^2 u}{\partial y^2} = 0$$

unutar elipse $\mathcal{E} : \dfrac{x^2}{4} + \dfrac{y^2}{9} = 1$, za granični uslov $u\big|_{\mathcal{E}} = g(x,y)$.

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