Parcijalne diferencijalne jednačine
Drugi kolokvijum $\sim$ 25.6.2015.

1. Rešiti mešoviti problem:

$$\begin{aligned}
&u_{tt} = 4u_{xx} + \frac{6}{\pi}(x^2-2)\sin 2t + 12t\sin^2 3x, \quad 0 < x < \frac{\pi}{6},\ t > 0\\
&u_x(0,t) = 0,\ u_x\left(\frac{\pi}{6}, t\right) = \frac{\sin 2t}{2},\\
&u(x,0) = 0, \quad u_t(x,0) = \frac{3x^2}{\pi}.
\end{aligned}$$

2. Rešiti mešoviti problem:

$$\begin{aligned}
&u_t = u_{xx} - 2u_x + x + 2t, \quad 0 < x < 1,\ t > 0\\
&u(0,t) = u(1,t) = t,\\
&u(x,0) = e^x \sin \pi x.
\end{aligned}$$

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

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

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

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