Rješenja zimskog ispitnog roka iz Matematike 3E
15.02.2012.

1. **(7 bodova)**
   (a)(2 boda) Vidi knjigu.
   (b)(5 bodova)
   $b_n = 0, \quad \forall n, \qquad a_0 = -\frac{1}{2}, \qquad a_2 = -\frac{1}{8}, \qquad a_n = \frac{2(-1)^n}{n^2-4}, \quad n = 1, 3, 4, \ldots$
   $S(x) = -\frac{1}{4} + \frac{2}{3}\cos 2x - \frac{1}{8}\cos 4x + \sum_{n=3}^{\infty} \frac{2(-1)^n}{n^2-4}\cos 2nx \ .$

2. **(8 bodova)**
   (a)(1 bod) Vidi knjigu.
   (b)(2 boda) Vidi knjigu.
   (c)(5 bodova)
   $E(s) = \frac{e^{-s}}{s} - \frac{e^{-2s}}{s},$
   $Z(s) = \frac{s(s^2+1)}{2s^2+1},$
   $i(t) = (t-1)u(t-1) - (t-2)u(t-2) + \sin(t-1)u(t-1) - \sin(t-2)u(t-2).$

3. **(4 boda)**
   $V = \frac{32\pi}{3}.$

4. **(6 bodova)**
   (a)(1 bod) Vidi knjigu.
   (b)(1 bod) Vidi knjigu.
   (c)(1 bod) Vidi knjigu.
   (d)(3 boda)
   $\left.\frac{\partial \mathbf{b}}{\partial \mathbf{a}}\right|_T = \frac{2\sqrt{3}}{3}\mathbf{i} + \frac{4\sqrt{3}}{3}\mathbf{j} - \frac{4\sqrt{3}}{3}\mathbf{k}.$

5. **(5 bodova)**
   (a)(1 bod) Vidi knjigu.
   (b)(4 boda)
   $\oint_\Gamma (e^x - y^3)\,dx + (\cos y + x^3)\,dy = \frac{3\pi}{4}.$

6. **(4 boda)**
   $l = \pi\sqrt{2}.$

7. **(6 bodova)**
   $\iint_\Sigma x^2\,dydz + y^2\,dxdz + z^2\,dxdy = \frac{15\pi}{4}.$