

**Rješenje prve školske zadaće iz Matematike 3R  
Grupa R1**

14.10.2011.g.

**Grupa A**

1. (4 boda)  $S(x) = \frac{1}{\pi}(1 - e^{-\pi}) + \frac{2e^{-\pi}}{\pi} \sum_{n=1}^{\infty} \frac{e^{\pi+(-1)^{n+1}}}{1+n^2} \cos(nx)$   
 $1 = f(0) = S(0) = \frac{1}{\pi}(1 - e^{-\pi}) + \frac{2e^{-\pi}}{\pi} \sum_{n=1}^{\infty} \frac{e^{\pi+(-1)^{n+1}}}{1+n^2} \implies$   
 $\sum_{n=1}^{\infty} \frac{e^{\pi+(-1)^{n+1}}}{1+n^2} = \frac{e^{\pi}}{2}(\pi - 1 + e^{-\pi})$

2. (4 boda)  $\tilde{f}(x) = \frac{1}{\pi} \int_0^{\infty} \frac{2\lambda}{\lambda^2-1} (1 + \cos(\lambda\pi)) \sin(\lambda x) d\lambda$

3. (2 boda) Funkcija  $f(x) = 2 + \sin \frac{\pi x}{2} + \cos(4\pi x) + \operatorname{tg}(3\pi x)$  je periodična s periodom 4.

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**Grupa B**

1. (4 boda)

$$S(x) = \frac{3}{4} - \frac{2}{\pi^2} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^2} \cos((2n-1)\pi x) \\ + \frac{3}{\pi} \sum_{n=1}^{\infty} \frac{1}{2n-1} \sin((2n-1)\pi x) - \frac{1}{2\pi} \sum_{n=1}^{\infty} \frac{1}{n} \sin(2n\pi x)$$

$$\frac{1}{2} = f(0) = S(0) = \frac{3}{4} - \frac{2}{\pi^2} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^2} \implies \sum_{n=1}^{\infty} \frac{1}{(2n-1)^2} = \frac{\pi^2}{8}$$

2. (4 boda)  $\tilde{f}(x) = -\frac{2}{\pi} \int_0^{\infty} \frac{\lambda}{\lambda^2+1} \sin(\lambda x) d\lambda$

3. (2 boda)  $c_0 = \frac{\pi^2}{3}, c_n = \frac{4}{n^2}$