Rješenja drugog međuispita iz Matematike 3E
02.12.2009.

1. (3 boda)

$$\iint_D (x^2 + y)\,dx\,dy = \frac{33}{140}.$$

2. (4 boda)

a) (**1b**) "Višestruki integrali", str. 12, Teorem 7.

b) (**3b**) Primjenom geometrijske interpretacije Teorema 7 dobijemo

$$h = \frac{V}{\mu(D)} = \frac{\iint_D f(x,y)\,dx\,dy}{\pi} = \frac{2}{3}(5\sqrt{5} - 8).$$

$$V = \frac{2\pi}{3}(5\sqrt{5} - 8).$$

3. (3 boda)

$$\iiint_V x\,dx\,dy\,dz = \frac{1}{12}.$$

4. (5 bodova)

$$\iiint_V \frac{y^2}{\sqrt{(x-2)^2 + y^2 + z^2}}\,dx\,dy\,dz = \frac{\pi}{3}.$$

5. (5 bodova)

$$V = \iiint_V dx\,dy\,dz = \frac{\pi}{8}.$$

6. (5 bodova)

a) (**2b**) "Vektorska analiza", str. 7, 1.3, dokaz na dnu stranice.

b) (**3b**)

$$x = \frac{1}{2} - \frac{\sqrt{3}}{2}u, \quad y = \frac{\sqrt{3}}{2} + \frac{1}{2}u, \quad z = 1 - \sqrt{3} - u, \qquad u \in \mathbb{R}.$$