NASLOV
PODNASLOV

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Sadržaj

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Spisak tabela

1 Naslov

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1.1 Podnaslov

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1.1.1 Podpodnaslov

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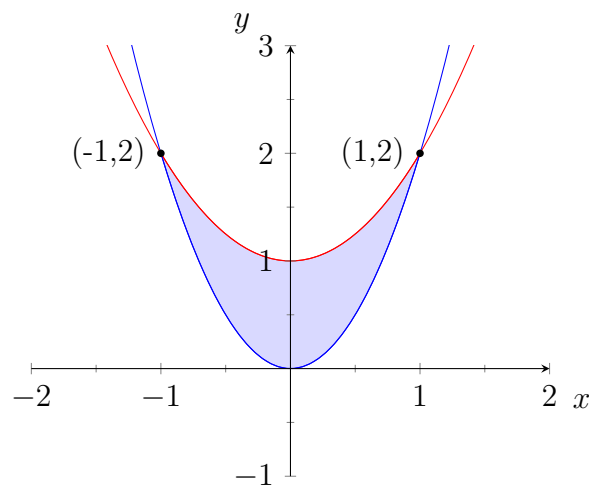
2 Primjeri

2.1 Slika

Slika 1: Logo PMF koji nije Word 2003 clip art

2.2 Zadatak

Zadatak 1 *Izračunati integral I ako je D oblast ograničena sa $y_1 = 2x^2$, $y_2 = 1 + x^2$.*

$$I = \iint_D (x + 2y) \ \mathrm{d}x \, \mathrm{d}y \,.$$

Slika 2: Slika uz zadatak 1

Prvi korak je odrediti granice: $2x^2 = 1 + x^2 \implies x = \pm 1$. Tačke presjeka su dakle $(1, 2)$ i $(-1, 2)$.

$$x \Big|_{-1}^{1}, \qquad y \Big|_{2x^2}^{1+x^2} \,.$$

4

$$I = \int_{-1}^{1} \mathrm{d}x \int_{2x^2}^{1+x^2} (x + 2y)\,\mathrm{d}y = \int_{-1}^{1} \mathrm{d}x \left(xy\Big|_{2x^2}^{1+x^2} + 2y^2\Big|_{2x^2}^{1+x^2} \right)$$

$$= \int_{-1}^{1} \left\{ x(1 + x^2 - 2x^2) + 2\left[(1 + x^2)^2 - (2x^2)^2\right] \right\} \mathrm{d}x$$

$$= \ldots = \frac{32}{15}. \tag{1}$$

2.3 Tabela

Value 1	Value 2	Value 3
α	β	γ
1	1110.1	a
2	10.1	b
3	23.113 231	c

Tabela 1: Tabela s paketom booktabs.

2.4 Kompleksnija tabela

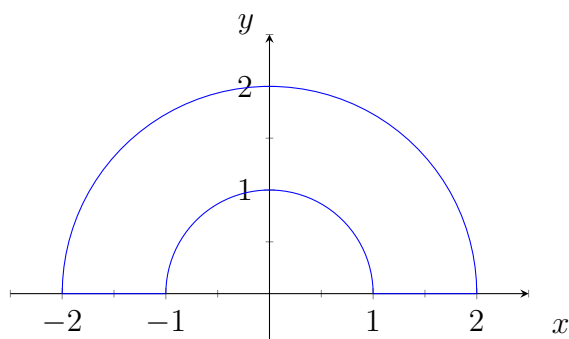| m	$\mathrm{Re}\{\underline{\mathfrak{X}}(m)\}$	$-\mathrm{Im}\{\underline{\mathfrak{X}}(m)\}$	$\mathfrak{X}(m)$	$\frac{\mathfrak{X}(m)}{23}$	A_m	$\varphi(m)$ / $^\circ$	φ_m / $^\circ$
1	16.128	8.872	16.128	1.402	1.373	-146.6	-137.6
2	3.442	-2.509	3.442	0.299	0.343	133.2	152.4
3	1.826	-0.363	1.826	0.159	0.119	168.5	-161.1
4	0.993	-0.429	0.993	0.086	0.08	25.6	90
5	1.29	0.099	1.29	0.112	0.097	-175.6	-114.7
6	0.483	-0.183	0.483	0.042	0.063	22.3	122.5
7	0.766	-0.475	0.766	0.067	0.039	141.6	-122
8	0.624	0.365	0.624	0.054	0.04	-35.7	90
9	0.641	-0.466	0.641	0.056	0.045	133.3	-106.3
10	0.45	0.421	0.45	0.039	0.034	-69.4	110.9
11	0.598	-0.597	0.598	0.052	0.025	92.3	-109.3

Tabela 2: Kompleksna tabela

2.5 Mjerne jedinice

Paket `siunits` dozvoljava da se lako i pravilno pišu veličine koje imaju mjerne jedinice. Kako se često pogrešno radi: $g = 9.81 ms^{-2}$. Kako je pravilno: $g = 9.81\,\mathrm{m\,s^{-2}}$.

2.6 Matematika

Zadatak 2 *Izračunati $\oint y^2 \, \mathrm{d}x + 3xy \, \mathrm{d}y$ na konturi sa slike 3.*

$$\oint_C P \, \mathrm{d}x + Q \, \mathrm{d}y = \iint \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) \mathrm{d}x \, \mathrm{d}y$$

$$Q = 3xy, \qquad \frac{\partial Q}{\partial x} = 3y$$

$$P = y^2, \qquad \frac{\partial P}{\partial y} = 2y$$

$$\left. r \right|_1^2, \qquad \left. \varphi \right|_0^\pi$$

Slika 3: Slika uz zadatak 2

$$\oint_C = \iint_C (3y - 2y) \, \mathrm{d}x \, \mathrm{d}y = \iint_C y \, \mathrm{d}x \, \mathrm{d}y$$
$$= \int_1^2 \int_0^\pi r^2 \sin \varphi \, \mathrm{d}r \, \mathrm{d}\varphi = \left. \frac{r^3}{3} \right|_1^2 \left. (-\cos \varphi) \right|_0^\pi = \frac{14}{3}.$$

Zadatak 3 *Ako je vektorsko polje oblika $\mathbf{F} = P\mathbf{i} + Q\mathbf{j} + R\mathbf{k}$ dokazati da je $\operatorname{div} \operatorname{rot} \mathbf{F} = 0$.*

$$\operatorname{rot} \mathbf{F} = \left(\frac{\partial R}{\partial y} - \frac{\partial Q}{\partial z} \right) \mathbf{i} - \left(\frac{\partial R}{\partial x} - \frac{\partial P}{\partial z} \right) \mathbf{j} + \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) \mathbf{k}$$

$$\operatorname{div} \operatorname{rot} \mathbf{F} = \frac{\partial}{\partial x} \left(\frac{\partial R}{\partial y} - \frac{\partial Q}{\partial z} \right) - \frac{\partial}{\partial y} \left(\frac{\partial R}{\partial x} - \frac{\partial P}{\partial z} \right) + \frac{\partial}{\partial x} \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) = 0.$$