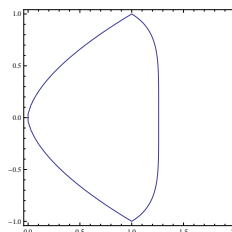


Rešitve nalog

1.1 i) Ne, ker npr. $d_1(x, -x) = 0$, za $x \neq 0$. ii) Da. iii) Da. iv) Ne, ker je vedno $d_4 \geq 2$.

1.2 Ne, ker je: $(1, 1) \neq (2, 1)$ in $d((1, 1), (2, 1)) = 0$.

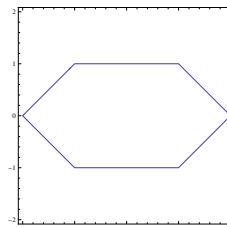
1.3 $K((1, 0), 1) = \{(x, y); |x^3 - 1| + |y^5| < 1\}$. Za $x \geq 1$ in $y \geq 0$ dobimo $x^3 + y^5 < 2$. Rob je krivulja $y = \sqrt[5]{2 - x^3}$. Za $x < 1$ in $y \geq 0$ pa dobimo $y = x^{3/5}$. Krogla je simetrična glede na os x .



Slika R.1, $K((1, 0), 1)$

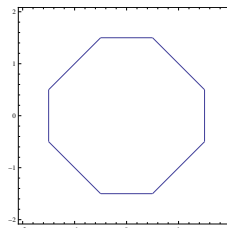
1.4 $K(0, 2) = (-1, 1)$.

1.5 “Elipsa” je šesterokotnik, ki ga tvorijo premice $y = \pm(x \pm a)$ ter $y = \pm a$. Razdalja točke $T(1, 0)$ do premice $y = kx$ je v tej metriki $\min\{|k|, 1\}$!



Slika R.2, “elipsa” pri $e = 1$ in $2a = 4$.

1.6 Elipsa je osmerokotnik, ki ga tvorijo premice $y = \pm x \pm (2a - e)$, $y = \pm a$ in $x = \pm a$. Razdalja točke $T(1, 0)$ do premice $y = kx$ je tu $1/(1 + |k|)$.



Slika R.3, “elipsa” pri $e = 1$ in $2a = 3$.

1.8 Ne, vedno je $d'(a, b) \geq 1$.

1.9 i) $n > 1/\varepsilon - 3$, v posebnem primeru $\varepsilon = 1/10$, $n > 7$ in $\varepsilon = 1/100$, $n > 97$.

ii) $n > 10/\varepsilon - 10$, v posebnem primeru $\varepsilon = 1/10$, $n > 90$ in $\varepsilon = 1/100$, $n > 990$.

iii) $n > 1/\varepsilon + 1$, v posebnem primeru $\varepsilon = 1/10$, $n > 11$ in $\varepsilon = 1/100$, $n > 101$.

1.10 i) zaprta, ii) nič.

1.11 ii) $x = 0.45$.

1.13 Za Fourierove koeficiente velja $a_0 = 0$; $a_k = b_k = 0$ za $k = 2m$.

1.14 $\frac{1}{2} \cos x + \frac{\sqrt{3}}{2} \sin x.$

1.15 $\frac{3}{8} + \frac{1}{2} \cos 2x + \frac{1}{8} \cos 4x.$

1.16 $\frac{\pi}{2} - \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{\cos(2n-1)x}{(2n-1)^2}, \quad \frac{\pi}{2}.$

1.17 $\frac{\pi}{2} + \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{\cos(2n-1)x}{(2n-1)^2}.$

1.18 $\frac{2}{3} + \sum_{k=1}^{\infty} a_k \cos \frac{2k\pi x}{3}$

1.19 $\frac{2}{\pi} - \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{1}{4n^2 - 1} \cos nx.$

1.20 $\frac{2}{\pi} + \frac{4}{\pi} \sum_{k=1}^{\infty} \frac{(-1)^k}{1 - 4k^2} \cos 6kx.$

1.21 $1 + \sum_{k=1}^{\infty} \frac{2(-1)^k}{\pi(2k-1)} \cos(2k-1)x.$

1.22 $\frac{8}{\pi} \sum_{k=1}^{\infty} \frac{1}{(2k-1)^3} \sin(2k-1)x, \quad \frac{\pi^2}{32}.$

2.1 i) Elipsa $x^2/a^2 + y^2/b^2 \leq 1$, ii) Za $x \geq 2$ je $y \in [-2\sqrt{x-2}, 2\sqrt{x-2}]$,

