1. Vypočítajte integrál $\int_K \frac{e^z}{z^2+3z+2}\,dz$
 a) K je JUPCHK$\oplus$, $-1 \in \operatorname{int} K$, $-2 \in \operatorname{ext} K$.
 b) K je JUPCHK$\ominus$, $-1, -2 \in \operatorname{int} K$
 c) K je JUPCHK$\oplus$, $-1, -2 \in \operatorname{ext} K$
2. Vypočítajte integrál $\int_K \frac{z}{(z+2)(z+1)^2}\,dz$
 a) K je JUPCHK$\ominus$, $-1 \in \operatorname{int} K$, $-2 \in \operatorname{ext} K$.
 b) K je JUPCHK$\oplus$, $-1, -2 \in \operatorname{int} K$
 c) K je JUPCHK$\oplus$, $-1, -2 \in \operatorname{ext} K$
3. Nájdite lineárne lomené zobrazenie $f(z)$, pre ktoré:
 a. $f(i) = -1$, $f(1+i) = i$, $f(1) = \infty$. [[]$\frac{(i-2)z+2+i}{z-1}$]
 b. $f(-1) = i$, $f(i) = 1+i$, $f(\infty) = 1$. [[]$\frac{z+2+i}{z+2-i}$]
 c. $f(-i) = 0$, $f(0) = \frac{1}{2}(1-i)$, $f(-i) = 0$. [[]$\frac{iz-1}{2z+i+1}$]
 d. $f(-1) = -\frac{1}{2}i$, $f(i) = \frac{1}{2}(-1+i)$, $f(2) = i$. [[]$\frac{i}{z-1}$]
 e. $f(i) = -\frac{1}{3}$, $f(-2i) = \infty$, $f(\infty) = 2$. [[]$\frac{2z-i}{z+2i}$]
4. Nájdite lineárne lomené zobrazenie $f(z)$, ktoré zobrazí
 a. $\{z \in C\colon \operatorname{Re} z > 1\} \to \{z \in C\colon |z-2| > 1\}$ [[]$\frac{z-4}{z-2}$]
 b. $\{z \in C\colon \operatorname{Re} z > 0\} \to \{z \in C\colon \operatorname{Re} z < 0\}$ [[]$f(z) = -z$]
 c. $\{z \in C\colon \operatorname{Re} z > 0\} \to \{z \in C\colon |z| < 1\}$ [[]$\frac{z-1}{z+1}$]
 d. $\{z \in C\colon \operatorname{Re} z > 0\} \to \{z \in C\colon |z| > 1\}$ [[]$\frac{z+1}{z-1}$]
 f. $\{z \in C\colon |z| < 1\} \to \{z \in C\colon \operatorname{Im} z < 0\}$ [[]$\frac{iz+1}{z+i}$]
 e. $\{z \in C\colon |z| > 1\} \to \{z \in C\colon \operatorname{Im} z < 0\}$ [[]$\frac{z+i}{iz+1}$]
5. Ukážte, že funkcia f je analytická v oblasti M a určte $\max\limits_M f(z)$, ak
 a. $M = \{z \in C\colon \operatorname{Re} z \leq 0\}$, $f(z) = \frac{e^z}{z-1}$ [[]1]
 b. $M = \{z \in C\colon 0 \leq \operatorname{Re} z \leq 1\}$, $f(z) = \frac{2}{z-2}$ [[]2]
 c. $M = \{z \in C\colon \operatorname{Re} z \geq 1\}$, $f(z) = \frac{2}{z^2+1}$ [[]1]
 d. $M = \{z \in C\colon 1 \leq \operatorname{Re} z \leq 5\}$, $f(z) = \frac{1}{z^2+z}$ [[]1/2]
6. Určte $\max\limits_M f(z)$ $\min\limits_M f(z)$, ak
 a. $M = \{z \in C\colon |z| \leq 2\}$, $f(z) = z^2 + 5$ [[]1, 9]
 b. $M = \{z \in C\colon |z| \leq 4\}$, $f(z) = z^2 + 10$ [[]0, 26]
 c. M je trojuholník s vrcholmi $z = 0$, $z = \frac{\pi}{2}$, $z = i\frac{\pi}{2}$; $f(z) = e^z + 4$ [[]min $= \sqrt{17}$, max $= e^{(\pi/2)} + 4$]
 d. M je obdĺžnik $-1 \leq x \leq 1$, $0 \leq y \leq 1$, $f(z) = z^2 + 4$ [[]3, 5]
7. Určte $\max\limits_D f(z)$, $\min\limits_D f(z)$, $f(D)$ a $f(M)$, ak $D = \{z \in C\colon |z| \leq 1\}$, $M = \{z \in C\colon \operatorname{Re} \geq 0\}$.
 a. $f(z) = \frac{2z-i}{2+iz}$
 b. $f(z) = \frac{(2z-i)^2}{(2+iz)^2}$
 c. $f(z) = \frac{z+2i}{2iz-4}$
8. Vypočítajte komplexný Fourierov rad funkcie f.
 a. $f(t) = t$, $t \in \langle 0, 1)$
 b. $f(t) = t$, $t \in \langle -1, 1)$
 c. $f(t) = |t|$, $t \in \langle -1, 1)$
 d. $f(t) = e^t$, $t \in \langle -1, 1)$
 e. $f(t) = \begin{cases} 1+t, & t \in \langle -1, 0), \\ 1-t, & t \in \langle 0, 1) \end{cases}$
 f. $f(t) = t^2$, $t \in \langle -1, 1\rangle$