1. Kompleksni brojevi - Rješenja

1. $z_1 = 1+i, z_2 = 1-i, z_3 = 2i, z_4 = -2i$

2. (a) $z_1+z_2 = 3+2i$, $z_1-z_2 = -1-4i$, $z_1 \cdot z_2 = 5+i$, $\dfrac{z_1}{z_2} = -\dfrac{1}{13}-\dfrac{5}{13}i$

   (b) $z_1+z_2 = 2$, $z_1-z_2 = 2-2i$, $z_1 \cdot z_2 = 1+2i$, $\dfrac{z_1}{z_2} = -1-2i$

   (c) $z_1+z_2 = 3-2i$, $z_1-z_2 = 1+2i$, $z_1 \cdot z_2 = 2-4i$, $\dfrac{z_1}{z_2} = \dfrac{2}{5}+\dfrac{4}{5}i$

3. $t = 2$

4. $(z_2)_1 = -1$, $(z_2)_2 = -1-2i$

5. (a) i

   (b) i

   (c) -1

   (d) $-6-i$

6. $-\dfrac{3}{13}+\dfrac{2}{13}i$

7. $2-5i$

8. (a) $32i$

   (b) $-\dfrac{1}{2}-\dfrac{\sqrt{3}}{2}i$

   (c) $z_0 = 1$, $z_1 = -\dfrac{1}{2}+\dfrac{\sqrt{3}}{2}i$, $z_2 = -\dfrac{1}{2}-\dfrac{\sqrt{3}}{2}i$

   (d) $z_0 = \cos\dfrac{3\pi}{8}+i\sin\dfrac{3\pi}{8}$,

   $z_0 = \cos\dfrac{7\pi}{8}+i\sin\dfrac{7\pi}{8}$,

   $z_0 = \cos\dfrac{11\pi}{8}+i\sin\dfrac{11\pi}{8}$,

   $z_0 = \cos\dfrac{15\pi}{8}+i\sin\dfrac{15\pi}{8}$.

   (e) $z_0 = \sqrt[3]{2}\ (\cos\dfrac{\pi}{9}+i\sin\dfrac{\pi}{9})$,

   $z_1 = \sqrt[3]{2}\ (\cos\dfrac{7\pi}{9}+i\sin\dfrac{7\pi}{9})$,

$z_2 = \sqrt[3]{2}\ (\cos\frac{13\pi}{9} + i\sin\frac{13\pi}{9})$

(f) $z_0 = \sqrt{3}\ (\cos\frac{3\pi}{8} + i\sin\frac{3\pi}{8})$, $z_1 = \sqrt{3}\ (\cos\frac{11\pi}{8} + i\sin\frac{11\pi}{8})$

9. (a) $z_0 = \frac{1}{\sqrt[6]{2}}\ (\cos\frac{\pi}{2} + i\sin\frac{\pi}{2})$,

$z_1 = \frac{1}{\sqrt[6]{2}}\ (\cos\frac{7\pi}{6} + i\sin\frac{7\pi}{6})$,

$z_2 = \frac{1}{\sqrt[6]{2}}\ (\cos\frac{11\pi}{6} + i\sin\frac{11\pi}{6})$

(b) $z_0 = \frac{1}{2} - \frac{\sqrt{3}}{2}i$, $z_1 = 1 + \frac{\sqrt{3}}{2} - \frac{1}{2}i$, $z_2 = \frac{3}{2} + \frac{\sqrt{3}}{2}i$, $z_3 = 1 - \frac{\sqrt{3}}{2} + \frac{1}{2}i$

10. (a) $\{(x,y) \in \mathbb{R}^2 \colon x^2 + (y-1)^2 \geq 1\}$

(b) $\{(x,y) \in \mathbb{R}^2 \colon y \leq -x + 1\}$

(c) $\{(x,y) \in \mathbb{R}^2 \colon x \leq 1 - \frac{1}{4}y^2\}$

(d) $\{(x,y) \in \mathbb{R}^2 \colon x^2 + y^2 \geq 4,\ x^2 + y^2 \leq 9\}$

(e) $\{(x,y) \in \mathbb{R}^2 \colon y < \frac{x^2}{4} - 1\}$

(f) $\{(x,y) \in \mathbb{R}^2 \colon x^2 + y^2 \geq 4,\ x^2 + y^2 \leq 9,\ \arg z \geq \frac{\pi}{3},\ \arg z \leq \pi\}$