

# ESERCIZI SUI NUMERI COMPLESSI

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Risolvere le seguenti equazioni in  $\mathbb{C}$ .

1.  $z^4 + 2 = 0$

2.  $z^2 + 1 - 2i = 0$

3.  $z^{13} + i = 0$

4.  $z^{16} - 1 = 0$

5.  $(3 + 4i)z^5 = 12 + 5i$

6.  $z^2 - z + 1 = 0$

7.  $z^2 - 2iz + 1 = 0$

### Soluzioni.

1.  $z = \sqrt[4]{2} (\pi/4 + k\pi/2) + i \sin(\pi/4 + k\pi/2)$ ,  $k = 0, 1, 2, 3$
2.  $z = \pm (\cos([\pi - \arctan(2)]/2) + i \sin([\pi - \arctan(2)]/2))$
3.  $z = (\cos(-\pi/26 + k\pi \frac{2}{13}) + i \sin(-\pi/26 + k\pi \frac{2}{13}))$ ,  $k \in \mathbb{Z}$ ,  $0 \leq k \leq 12$
4.  $z = 1, -1, i, -i, \frac{1+i}{\sqrt{2}}, \frac{1-i}{\sqrt{2}}, \frac{-1+i}{\sqrt{2}}, \frac{-1-i}{\sqrt{2}}$  e  $z = (\cos(\pi/8 + k\pi/4) + i \sin(\pi/8 + k\pi/4))$ ,  $k = 0, 1, 2, 3$
5.  $z = \sqrt[5]{\frac{13}{5}} (\cos([-\arctan(33/56) + 2k\pi]/5) + i \sin([-\arctan(33/56) + 2k\pi]/5))$ ,  $k = 0, 1, 2, 3, 4$
6.  $z = \frac{1}{2} \pm i \frac{\sqrt{3}}{2}$
7.  $z = i(1 \pm \sqrt{2})$