24. Deljenje kompleksnih brojeva – vežbe

ZADATAK 1. Ako su dati kompleksni brojevi $z_1 = 1 + 2i$ i $z_2 = 4 - 5i$ izračunati vrednost izraza $W = \dfrac{z_1 \cdot \bar{z}_2 - 9 \cdot i^{50}}{z_1^2 + z_2}$.

Rešenje:

$$W = \frac{z_1 \cdot \bar{z}_2 - 9 \cdot i^{50}}{z_1^2 + z_2} = \frac{(1+2i)(4+5i) - 9 \cdot i^{4 \cdot 12 + 2}}{(1+2i)^2 + (4-5i)} = \frac{4 + 5i + 8i + 10i^2 - 9 \cdot (-1)}{1 + 4i + 4i^2 + 4 - 5i} = \frac{3+13i}{1-i} =$$

$$= \frac{3+13i}{1-i} \cdot \frac{1+i}{1+i} = \frac{3 + 3i + 13i + 13i^2}{1 - i^2} = \frac{-10 + 16i}{2} = -\frac{10}{2} + i\frac{16}{2} = -5 + 8i .$$

ZADATAK 2. Nađi realni i imaginarni deo kompleksnog broja z ako je:

a) $z = (2-3i)(3+4i) + \dfrac{1-i}{1+i} + (2+i)^2 + (1+i)^4$, $\quad [R: \mathrm{Re}(z) = 17, \mathrm{Im}(z) = 2]$

b) $z = \dfrac{(1-i)^2}{1+i} - \dfrac{(1-i)^3}{1+i}$, $\quad [R: \mathrm{Re}(z) = 1, \mathrm{Im}(z) = -1]$

c) $z = \dfrac{i^{102} + i^{101}}{i^{100} - i^{99}}$, $\quad [R: \mathrm{Re}(z) = 0, \mathrm{Im}(z) = 1]$

d) $z = \dfrac{-41 + 63i}{50} - \dfrac{6i+1}{1-7i}$, $\quad [R: \mathrm{Re}(z) = 0, \mathrm{Im}(z) = 1]$

e) $z = \left(\dfrac{-1 + i\sqrt{3}}{2i}\right)^2$, $\quad \left[R: \mathrm{Re}(z) = \dfrac{1}{2}, \mathrm{Im}(z) = \dfrac{\sqrt{3}}{2}\right]$

f) $z = \dfrac{13+12i}{6i-8} + \dfrac{(2i+1)^2}{i+2}$, $\quad \left[R: \mathrm{Re}(z) = -\dfrac{18}{25}, \mathrm{Im}(z) = \dfrac{23}{50}\right]$

g) $z = \dfrac{(1+2i)^2 - (1-i)^3}{(3+2i)^3 - (2+i)^2}$ $\quad \left[R: \mathrm{Re}(z) = \dfrac{22}{159}, \mathrm{Im}(z) = -\dfrac{5}{318}\right]$

DOMAĆI ZADATAK:

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