

23. Deljenje kompleksnih brojeva

ZADATAK 1. Nađi $\operatorname{Re}(z)$ i $\operatorname{Im}(z)$ ako je $z = \frac{7+2i}{4-3i}$.

Rešenje:

$$z = \frac{7+2i}{4-3i} = \frac{7+2i}{4-3i} \cdot \frac{4+3i}{4+3i} = \frac{28+21i+8i+6i^2}{16-9i^2} = \frac{28-6+29i}{16+9} = \frac{22+29i}{25} = \frac{22}{25} + i\frac{29}{25}$$

$$\operatorname{Re}(z) = \frac{22}{25} \quad \text{i} \quad \operatorname{Im}(z) = \frac{29}{25}.$$

ZADATAK 2. Ako su dati kompleksni brojevi $z_1 = 5+4i$, $z_2 = 1-i$ i $z_3 = 3i$ izračunati:

$$\frac{z_1}{z_2}, \frac{z_2}{z_3} \quad \text{i} \quad \frac{z_3}{z_1}.$$

Rešenje:

$$\frac{z_1}{z_2} = \frac{5+4i}{1-i} = \frac{5+4i}{1-i} \cdot \frac{1+i}{1+i} = \frac{5+4i+5i+4i^2}{1^2-i^2} = \frac{5+9i-4}{1+1} = \frac{1+9i}{2} = \frac{1}{2} + i\frac{9}{2};$$

$$\frac{z_2}{z_3} = \frac{1-i}{3i} = \frac{1-i}{3i} \cdot \frac{i}{i} = \frac{i-i^2}{3i^2} = \frac{i-(-1)}{3 \cdot (-1)} = \frac{i+1}{-3} = -\frac{1}{3} - i\frac{1}{3};$$

$$\frac{z_3}{z_1} = \frac{3i}{5+4i} = \frac{3i}{5+4i} \cdot \frac{5-4i}{5-4i} = \frac{15i-12i^2}{5^2-(4i)^2} = \frac{12+15i}{25+16} = \frac{12}{41} + i\frac{15}{41}.$$

ZADATAK 3. Ako su dati kompleksni brojevi $z_1 = -1+3i$ i $z_2 = 3-2i$ izračunati $\frac{z_1}{z_2}$.

Rešenje:

$$\frac{z_1}{z_2} = \frac{-1+3i}{3-2i} = \frac{-1+3i}{3-2i} \cdot \frac{3+2i}{3+2i} = \frac{-3-2i+9i+6i^2}{9-4i^2} = \frac{-3-2i+9i-6}{9+4} = \frac{-9+7i}{13} = -\frac{9}{13} + i\frac{7}{13}.$$

DOMAĆI ZADATAK:

Vene T. Bogoslavov 2 – 381, 382.