BSc 2 Software Design (Game/Web Dev)
Complex Numbers Tutorial

Q.1. (a) Let $z_1 = 2 - \sqrt{2}\,j$ and $z_2 = 3 - 2\,j$ where $j = \sqrt{-1}$. Calculate

(i) $3z_1 - 4z_2$.

(ii) $\frac{1}{2}(z_1 z_2)$.

(iii) $\frac{z_2}{z_1}$.

(b) Express $z_0 = \sqrt{3} - j$ in polar form and hence solve

$$z^5 = z_0 .$$

Q.2. (a) Let $z_1 = 3 + 4\,j$ and $z_2 = 7 - 3\,j$ where $j = \sqrt{-1}$. Calculate

(i) $3z_1 + 13z_2$.

(ii) $-6(z_1 z_2)$.

(iii) $\frac{3\,z_1}{7\,z_2}$.

(b) Express $z_0 = 1 + j$ in polar form and hence solve

$$z^3 = z_0 .$$

Q.3. (a) Let $z_1 = 7 + 8\,j$ and $z_2 = 6 - j$ where $j = \sqrt{-1}$. Calculate

(i) $7z_1 - 6z_2$.

(ii) $\frac{1}{7}(z_1 z_2)$.

(iii) $\frac{z_2}{5z_1}$.

(b) Express $z_0 = 1 + \sqrt{3}\,j$ in polar form and hence solve

$$z^4 = z_0 \quad .$$