Supplement 0

Problems on Complex Numbers

1. Let $\alpha = 1+2i,\ \beta = -2-i,\ \gamma = 1-i, \delta = 2i$. Find (in rectangular form)

   a. $3\alpha - (1+i)\beta$ b. $\dfrac{\delta}{\beta+\gamma}$

   c. $\alpha\overline{\alpha}$ d. $\gamma^3 - \gamma^2 + 2$

2. Let $\alpha = 1+i,\ \beta = 2i$. Find (in polar form)

   a. all of the square roots of α
   b. all of the cube roots of β

3. Find the roots of

   a. $p(z) = z^3 - 2z^2 + 5z + 26$
   b. $p(z) = z^3 + 6z^2 + 3z - 10$
   c. $p(z) = z^4 + 2z^3 + 9z^2 + 8z + 20$