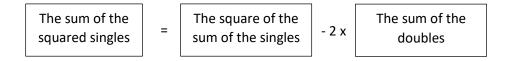
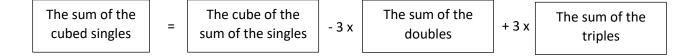
4D Expressions Relating to Roots of Polynomials

1.

a) Expand $(\alpha + \beta + \gamma)^2$

b) A cubic equation has roots α , β and γ such that $\alpha\beta + \beta\gamma + \gamma\alpha = 7$ and $\alpha + \beta + \gamma = -3$. Find the value of $\alpha^2 + \beta^2 + \gamma^2$.





The three roots of a cubic equation are α, β and γ.
Given that αβγ = 4, αβ + βγ + γα = -5 and α + β + γ = 3, find the value of (α + 3)(β + 3)(γ + 3).