Q) If α, β, γ are the cube roots of p (p < 0), then for any x, y and z, find the value of [xα + yβ + zγ] / [xβ + yγ + zα].

Solution:

Since p < 0.

Let p = −q, where q is positive.

Therefore, $p^{1/3} = -q1^{/3}(1)^{1/3}$.

Hence α = $-q^{1/3}$, β = $-q^{1/3}$ ω and γ = $-q^{1/3}\omega^2$

The given expression [x + yω + $z\omega^2$] / [xω + $y\omega^2$ + z] = (1 / ω) * [zω + $y\omega^2$ + z] / [xω + $y\omega^2$ + z]

= ω^2.