$(1-w^2) = 1+1+w = 2+w$

$(1-w^4) = (1-w)$

$(1-w^5) = (1-w^2)$

$(1-w)(1-w^2)(1-w^4)(1-w^5)$

$= (1-w)(1-w^2)(1-w)(1-w^2)$

$= (1-w)^2(1-w^2)^2$

$= (2+w^2)^2(2+w)^2 = [(2+w^2)(2+w)]^2$

$= [4+2w+2w^2+w^3]^2$

$= (5-2)^2 = 3^2 = 9$

Q3:

$|(1-w+w^2)|(1+w-w^2) = 4$

Sol:

$w^3 = 1,\ w^2 = -w^3 - w$

$|(w^3-w-w^3-w)|(w^3+w\ \ -w^3-w) = 4$

$(-2w)$

$(w^3-w-w^3-w)(w^3-w^3-w^2-w^2)$

$(-2w)(-2w^2)$

$4w^3 = 4$

$4(1) = 4$

Ex:

$z_1 = 1 - 3i \ , \quad z_2 = 2 + 7i$

$z_1 o z_2 = 2 - 21 = -19$

$z \times z = 7 + 6 = 13$

تمارين إضافية عن موضوع الاومیگا (w)

$w^3 = 1 \ , \ w^3 + w^2 + w = 0$

Q1:

$(1 + w^2)^4 = w$ اثبت ان

Sol:

$(w^3 + w^2)^4 = w$

$(-w)^4 = w$

$w^4 = w$

$w.w^3 = w$

$w.1 = w$

$w = w$

Q2:

$(1 - w)(1 - w^2)(1 - w^4)(1 - w^5) = 9$

Sol:

$w^3 + w^2 + w = 0$

$1 + w^2 + w = 0$

$-w = 1 + w^2$

$(1 - w) = 1 + 1 + w^2 = 2 + w^2$