EVALUACIÓN No. 1

1) OBTENER LA PARTE REAL Y LA PARTE IMAGINARIA DE:

$$f(z) = \frac{1}{z} - iz$$

Solución (6)

$$f(z) = \frac{1}{x-iy} - i(x+iy)$$

$$f(z) = \frac{1}{x-iy} \cdot \frac{x+iy}{x+iy} - ix - i^2y$$

$$f(z) = \frac{x+iy}{x^2+y^2} - ix + y$$

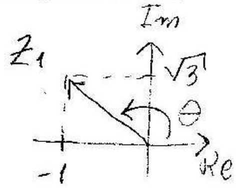
$$f(z) = \frac{x}{x^2+y^2} + \frac{iy}{x^2+y^2} - ix + y$$

$$f(z) = \left(\frac{x}{x^2+y^2} + y\right) + i\left(\frac{y}{x^2+y^2} - x\right)$$

2) OBTENGA LA FORMA BINOMICA:

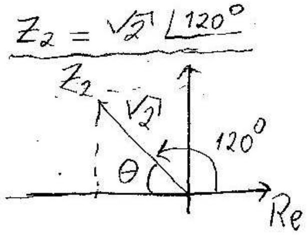
$$Z_0 = \frac{(-1+i\sqrt{3})^3}{[i^8 + \sqrt{2}\angle 120^\circ]} \quad (7)$$

$Z_1 = -1+i\sqrt{3}$



$$\sqrt{(1^2+\sqrt{3}^2)}\angle 180^\circ - 60^\circ = 2\angle 120^\circ \quad ; \quad i^4 \cdot i^4 = 1$$

$Z_2 = \sqrt{2}\angle 120^\circ$



$$\theta = 180^\circ - 120^\circ = 60^\circ$$

$$x = \sqrt{2}\cos(60^\circ) = 0{,}707$$

$$y = \sqrt{2}\,\text{sen}(60^\circ) = 1{,}224$$

$$Z_2 = -0{,}707 + i\,1{,}224$$

ENTONCES:

$$Z_0 = \frac{(2\angle 120^\circ)^3}{[1 - 0{,}707 + i\,1{,}224]} =$$

$$Z_0 = \frac{(2\angle 120^\circ)^3}{0{,}293 + i\,1{,}224} = \frac{8\angle 360^\circ}{0{,}293 + i\,1{,}224}$$

$$Z_0 = \frac{8\angle 0^\circ}{1{,}259\angle 76{,}54^\circ} = \frac{8}{1{,}259}\angle 0^\circ - 76{,}54^\circ$$

$$Z_0 = 6{,}35\angle -76{,}54^\circ$$

$$Z_0 = 6{,}35\cos(-76{,}54) + i\,6{,}35\,\text{sen}(-76{,}54)$$

$$Z_0 = 1{,}478 - i\,6{,}176$$

3) OBTENGA LA FORMA POLAR DE:

$$Z_0 = 2e^{(1-i)} - \sqrt[4]{i}$$

$$* \ \sqrt[4]{i} = (1\angle 90^\circ)^{1/4} = 1\angle 22{,}5^\circ$$

$$* \ 2e^{1-i} = 2 \cdot e^{1} \cdot e^{-i} = 5{,}43 \cdot e^{-i} =$$

$$= 5{,}43[\cos(-1) + \text{sen}(-1)] =$$

$$= 5{,}43(0{,}54 - i\,0{,}84) = 2{,}93 - i\,4{,}56$$

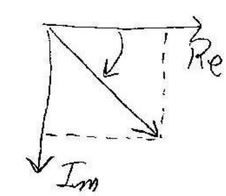
POR LO TANTO:

$$Z_0 = (2{,}93 - i\,4{,}56) - 1\angle 22{,}5^\circ$$

$$Z_0 = (2{,}93 - i\,4{,}56) - (0{,}923 + i\,0{,}382)$$

$$Z_0 = 2{,}007 - i\,4{,}942$$

$$Z_0 = 5{,}333\angle -67{,}9^\circ$$



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