1) CALCULAR LA FORMA BINÓMICA DE:

$$Z_0 = \frac{sen(-1+i)}{\sqrt{-1+i}}$$

Solución:

$$* \quad Sen(-1+i) = \frac{e^{i(-1+i)} - e^{-i(-1+i)}}{2i} =$$

$$= \frac{1}{2i}\left(e^{-1}e^{-i} - e^{1}e^{i}\right) = -1,3 + i0,64$$

$$* \quad \sqrt{-1+i} = \sqrt{1,41\angle 135^\circ} = 1,19\angle 67,5^\circ$$

ENTONCES:

$$Z_0 = \frac{-1,3+i0,64}{1,19\angle 67,5^\circ} = \frac{1,45\angle 153,94^\circ}{1,19\angle 67,5^\circ}$$

$$Z_0 = 1,22\angle 86,44^\circ = \boxed{0,075 + i1,21}$$

2) CALCULAR LA FORMA POLAR DE $Z_0 = e^{3(-1+i)} + i^{29}$

Solución:

$$Z_0 = e^{-3}\cdot e^{3i} + i^{29} \; ; \quad \begin{array}{r|l} 29 & 4 \\ 1 & 7 \end{array}$$

$$Z_0 = e^{-3}\{\cos(3) + iSen(3)\} + i$$

$$Z_0 = -0,05 + i0,007 + i = -0,5 + i1,007$$

$$\boxed{Z_0 = 1,008\angle 92,8^\circ}$$

3) CALCULAR EL VALOR DE K PARA QUE $Re\{f(z)\} = 0$.

$$f(z) = \frac{z+K}{\bar{z}} \; ; \quad z = x+iy$$

Solución:

$$f(z) = \frac{x+iy+K}{x-iy} * \frac{x+iy}{x+iy}$$

$$f(z) = \frac{x^2-y^2+Kx}{x^2+y^2} + i\,\frac{yx+yx+Ky}{x^2+y^2}$$

$$Re\{f(z)\} = 0$$

$$\frac{x^2-y^2+Kx}{x^2+y^2} = 0 \Rightarrow x^2-y^2+Kx = 0$$

$$K = \frac{-x^2+y^2}{x}$$

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