

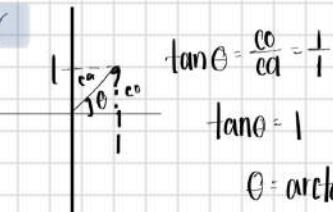
Actividad 1

Mérida de León Luis Ernesto

$$B. \left(\frac{16i}{1+i} \right)^{1/8} = \left(\frac{16i}{1+i} \left(\frac{1-i}{1-i} \right) \right)^{1/8} = \left(\frac{16i(1-i)}{1-(i^2)} \right)^{1/8} = \left(\frac{16i-16i^2}{1-i^2} \right)^{1/8} = \left(\frac{16i+16}{2} \right)^{1/8} = \left(\frac{16(i+1)}{2} \right)^{1/8} = (8(i+1))^{1/8}$$

$$|Z| = \sqrt{8^2 + 8^2} = \sqrt{64+64} = \sqrt{128} = \sqrt{64 \cdot 2} = 8\sqrt{2} = |Z|$$

$M=8 \rightarrow$ Cantidad de Heredades



$$\theta = \arctan(1) = 45^\circ = 0.25\pi$$

Z

$$\begin{aligned} Z^{1/m} &= r^{1/m} \left(\cos \frac{\theta}{m} + i \sin \frac{\theta}{m} \right) \\ Z^{1/m} &= r^{1/m} \left[\cos \frac{\theta + 2k\pi}{m} + i \sin \frac{\theta + 2k\pi}{m} \right] \end{aligned}$$

$$\begin{aligned} 180^\circ &\rightarrow \pi \\ 45^\circ &\rightarrow \end{aligned}$$

$$\text{radianes} = \text{grados} \times \frac{\pi}{180} = 0.25\pi$$

$$k=0 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi}{8} + i \sin \frac{0.25\pi}{8} \right] = 1.3477 + i(0.1327)$$

$$k=1 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi + 2(1)\pi}{8} + i \sin \frac{0.25\pi + 2(1)\pi}{8} \right] = 0.8591 + i(1.0468)$$

$$k=2 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi + 2(2)\pi}{8} + i \sin \frac{0.25\pi + 2(2)\pi}{8} \right] = -0.1327 + i(1.3477)$$

$$k=3 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi + 2(3)\pi}{8} + i \sin \frac{0.25\pi + 2(3)\pi}{8} \right] = -1.0468 + i(0.8591)$$

$$k=4 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi + 2(4)\pi}{8} + i \sin \frac{0.25\pi + 2(4)\pi}{8} \right] = -1.3477 - i(0.1327)$$

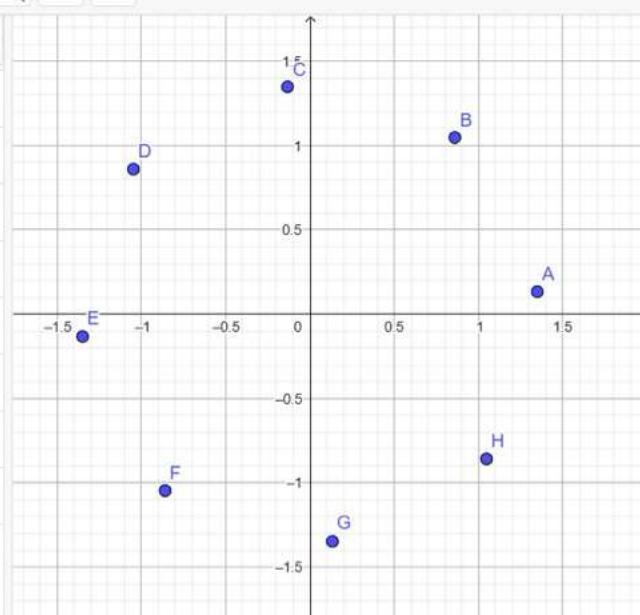
$$k=5 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi + 2(5)\pi}{8} + i \sin \frac{0.25\pi + 2(5)\pi}{8} \right] = -0.8591 - i(1.0468)$$

$$k=6 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi + 2(6)\pi}{8} + i \sin \frac{0.25\pi + 2(6)\pi}{8} \right] = 0.1327 - i(1.3477)$$

$$k=7 \quad (8+8i)^{1/8} = (8\sqrt{2})^{1/8} \left[\cos \frac{0.25\pi + 2(7)\pi}{8} + i \sin \frac{0.25\pi + 2(7)\pi}{8} \right] = 1.0468 - i(0.8591)$$

✓

<input checked="" type="radio"/>	A = (1.35, 0.13)									
<input checked="" type="radio"/>	B = (0.86, 1.05)									
<input checked="" type="radio"/>	C = (-0.13, 1.35)									
<input checked="" type="radio"/>	D = (-1.05, 0.86)									
<input checked="" type="radio"/>	E = (-1.35, -0.13)									
<input checked="" type="radio"/>	F = (-0.86, -1.05)									
<input checked="" type="radio"/>	G = (0.13, -1.35)									
<input checked="" type="radio"/>	H = (1.05, -0.86)									
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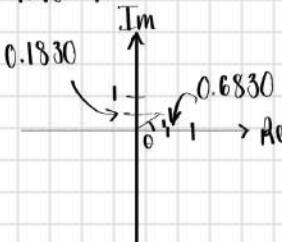
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$$\begin{aligned} 14. \quad & \left(\frac{1+i}{\sqrt{3}+i} \right)^{\frac{1}{16}} = \left(\frac{1+i}{\sqrt{3}+i} \left(\frac{\sqrt{3}-i}{\sqrt{3}-i} \right) \right)^{\frac{1}{16}} = \left(\frac{(1+i)(\sqrt{3}-i)}{3-i^2} \right)^{\frac{1}{16}} = \left(\frac{\sqrt{3}+\sqrt{3}i-i-(1)^2}{3-(-1)} \right)^{\frac{1}{16}} = \left(\frac{\sqrt{3}+\sqrt{3}i-i-1}{4} \right)^{\frac{1}{16}} = \left(\frac{(\sqrt{3}+1)+i(\sqrt{3}-1)}{4} \right)^{\frac{1}{16}} \\ & = \left(\left(\frac{\sqrt{3}+1}{4} \right) + i \left(\frac{\sqrt{3}-1}{4} \right) \right)^{\frac{1}{16}} \end{aligned}$$

$$|z| = \sqrt{\left(\frac{\sqrt{3}+1}{4} \right)^2 + \left(\frac{\sqrt{3}-1}{4} \right)^2} = \sqrt{0.4665 + 0.0334} = \sqrt{0.4999} = 0.7070 = 1$$

$m=6$

$$z^{1/m} = r^{1/m} \left[\cos \frac{\theta + 2k\pi}{m} + i \sin \frac{\theta + 2k\pi}{m} \right]$$



$$\frac{\sqrt{3}+1}{4} \approx 0.6830$$

$$\tan \theta = \frac{\text{op}}{\text{ad}} = \frac{0.6830}{0.1830} = 3.7322$$

$$\theta = \arctan(3.7322) \approx 75.0005^\circ$$

$$180^\circ \rightarrow \pi$$

$$75.0005^\circ \rightarrow 0.4166\pi$$

$$\bullet \quad k=0 \quad \left(\left(\frac{\sqrt{3}+1}{4} \right) + i \left(\frac{\sqrt{3}-1}{4} \right) \right)^{\frac{1}{16}} = 0.7070^{\frac{1}{16}} \left[\cos \frac{0.4166\pi + 2(0)\pi}{6} + i \sin \frac{0.4166\pi + 2(0)\pi}{6} \right] = 0.9214 + i(0.2042)$$

$$k=1 \quad \left(\left(\frac{\sqrt{3}+1}{4} \right) + i \left(\frac{\sqrt{3}-1}{4} \right) \right)^{\frac{1}{16}} = 0.7070^{\frac{1}{16}} \left[\cos \frac{0.4166\pi + 2(1)\pi}{6} + i \sin \frac{0.4166\pi + 2(1)\pi}{6} \right] = 0.2838 + i(0.9001)$$

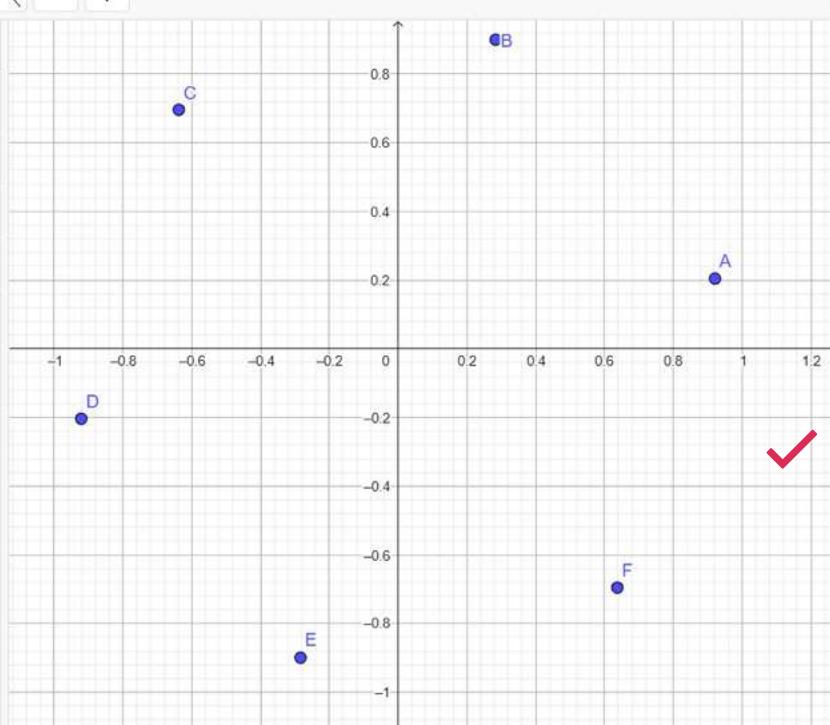
$$k=2 \quad \left(\left(\frac{\sqrt{3}+1}{4} \right) + i \left(\frac{\sqrt{3}-1}{4} \right) \right)^{\frac{1}{16}} = 0.7070^{\frac{1}{16}} \left[\cos \frac{0.4166\pi + 2(2)\pi}{6} + i \sin \frac{0.4166\pi + 2(2)\pi}{6} \right] = -0.6376 + i(0.6959)$$

$$k=3 \quad \left(\left(\frac{\sqrt{3}+1}{4} \right) + i \left(\frac{\sqrt{3}-1}{4} \right) \right)^{\frac{1}{16}} = 0.7070^{\frac{1}{16}} \left[\cos \frac{0.4166\pi + 2(3)\pi}{6} + i \sin \frac{0.4166\pi + 2(3)\pi}{6} \right] = -0.9214 - i(0.2042)$$

$$k=4 \quad \left(\left(\frac{\sqrt{3}+1}{4} \right) + i \left(\frac{\sqrt{3}-1}{4} \right) \right)^{\frac{1}{16}} = 0.7070^{\frac{1}{16}} \left[\cos \frac{0.4166\pi + 2(4)\pi}{6} + i \sin \frac{0.4166\pi + 2(4)\pi}{6} \right] = -0.2838 - i(0.9001)$$

$$k=5 \quad \left(\left(\frac{\sqrt{3}+1}{4} \right) + i \left(\frac{\sqrt{3}-1}{4} \right) \right)^{\frac{1}{16}} = 0.7070^{\frac{1}{16}} \left[\cos \frac{0.4166\pi + 2(5)\pi}{6} + i \sin \frac{0.4166\pi + 2(5)\pi}{6} \right] = 0.6376 - i(0.6959)$$

<input type="radio"/>	A = (0.92, 0.2)
<input type="radio"/>	B = (0.28, 0.9)
<input type="radio"/>	C = (-0.64, 0.7)
<input type="radio"/>	D = (-0.92, -0.2)
<input type="radio"/>	E = (-0.28, -0.9)
<input type="radio"/>	F = (0.64, -0.7)
+	Entrada...

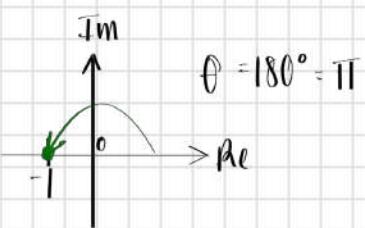


$$\text{If } z^4 + 1 = 0 \rightarrow z^4 = -1 + 0i = z = (-1 + 0i)^{\frac{1}{4}}$$

↓
W

$$|w| = \sqrt{(-1)^2 + (0)^2} = \sqrt{1} = 1 = r$$

$$m=4$$



$$z_k = r^{\frac{1}{m}} \left[\cos \frac{\theta + 2k\pi}{m} + i \sin \frac{\theta + 2k\pi}{m} \right]$$

$$k=0 \quad z_0 = (\sqrt[4]{1}) \left[\cos \frac{\pi + 2(0)\pi}{4} + i \sin \frac{\pi + 2(0)\pi}{4} \right] = \left[\cos \frac{\pi}{4} + i \sin \frac{\pi}{4} \right] = 0.7071 + i(0.7071)$$

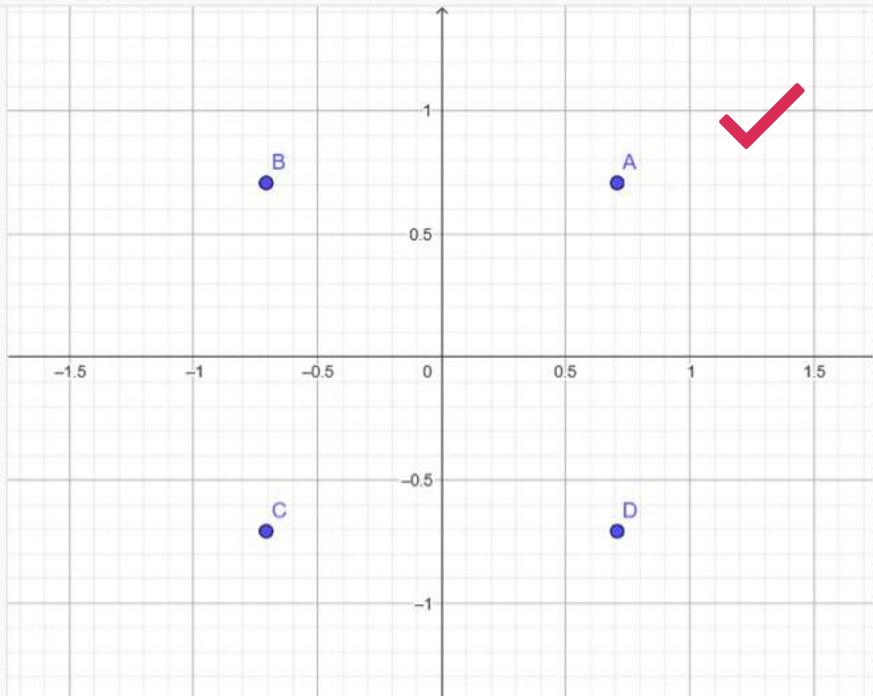
$$k=1 \quad z_1 = (\sqrt[4]{1}) \left[\cos \frac{\pi + 2(1)\pi}{4} + i \sin \frac{\pi + 2(1)\pi}{4} \right] = \left[\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4} \right] = -0.7071 + i(0.7071)$$

$$k=2 \quad z_2 = (\sqrt[4]{1}) \left[\cos \frac{\pi + 2(2)\pi}{4} + i \sin \frac{\pi + 2(2)\pi}{4} \right] = \left[\cos \frac{5\pi}{4} + i \sin \frac{5\pi}{4} \right] = -0.7071 - i(0.7071)$$

$$k=3 \quad z_3 = (\sqrt[4]{1}) \left[\cos \frac{\pi + 2(3)\pi}{4} + i \sin \frac{\pi + 2(3)\pi}{4} \right] = \left[\cos \frac{7\pi}{4} + i \sin \frac{7\pi}{4} \right] = 0.7071 - i(0.7071)$$



<input checked="" type="radio"/>	A = (0.71, 0.71)	<input type="button" value="≡"/>
<input checked="" type="radio"/>	B = (-0.71, 0.71)	<input type="button" value="≡"/>
<input checked="" type="radio"/>	C = (-0.71, -0.71)	<input type="button" value="≡"/>
<input checked="" type="radio"/>	D = (0.71, -0.71)	<input type="button" value="≡"/>
+	Entrada...	



18. $z^2 - 8z + 16 = 8i$

Considerando que: $8i = (2+2i)^2$

$$z^2 - 8z + 16 = (2+2i)^2$$

$$(z-4)(z-4) = (2+2i)^2$$

$$(z-4)^2 = (2+2i)^2$$

$$\sqrt{(z-4)^2} = \sqrt{(2+2i)^2}$$

$$\pm(z-4) = \pm(2+2i)$$

$$z = 4 \pm (2+2i)$$

$$z_1 = 4 + 2 + 2i$$

$$z_2 = 4 - 2 - 2i$$

$$\boxed{z_1 = 6 + 2i}$$

$$\boxed{z_2 = 2 - 2i}$$

$$\pm(z-4) = \pm(2+2i)$$

$$\rightarrow z-4 = -2-2i \leftarrow -$$

$$z = 4 - 2 - 2i = 2 - 2i$$

$$\leftarrow \rightarrow z-4 = 2+2i \leftarrow +$$

$$z = 6+2i$$

$$\leftarrow \rightarrow z+4 = -2-2i \leftarrow -$$

$$z = -6-2i$$

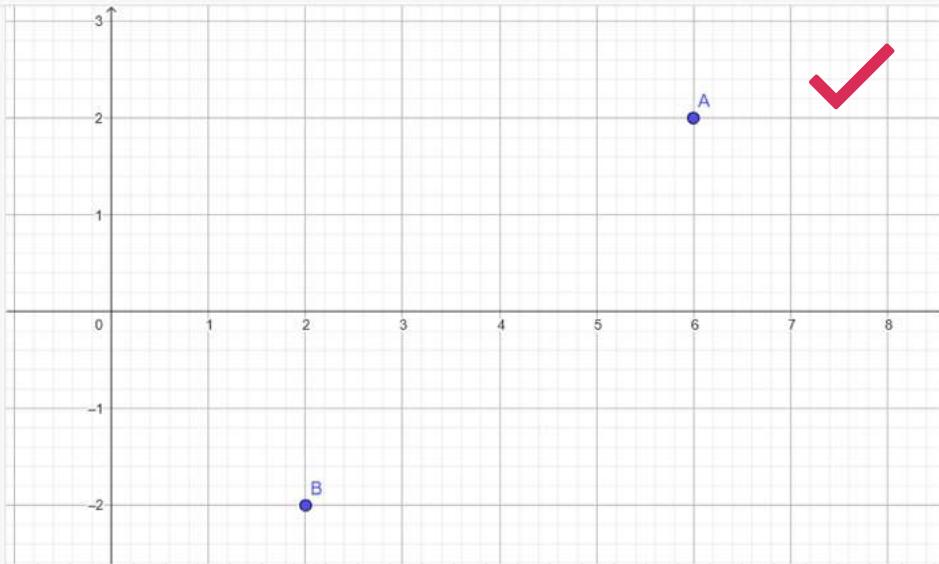
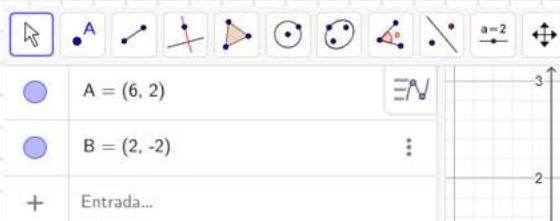
$$6+2i = z$$

$$\leftarrow \rightarrow z+4 = 2+2i \leftarrow +$$

$$4-2-2i = z$$

$$2-2i = z$$

No es necesario establecer \pm en ambos lados, porque siempre se llega a las mismas soluciones



Revisado

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