

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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Classe : 7<sup>o</sup> 3

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Solution :

$$E_1 : z^2 - 6z + 25 = 0$$

$$E_2 : z^2 - 8z + 25 = 0$$

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$$z^2 - 6z + 25 = 0$$

$$\Delta = 36 - 100 = -64 = 64i^2$$

$$\Rightarrow \sqrt{\Delta} = 8i$$

$$z_1 = \frac{6+8i}{2} = 3+4i$$

$$z_2 = \frac{6-8i}{2} = 3-4i$$

$$S_1 = \{3+4i, 3-4i\}$$

$$b/ z^2 - 8z + 25 = 0$$

$$\Delta = 64 - 100 = -36 = 36i^2$$

$$\sqrt{\Delta} = 6i$$

$$z_3 = \frac{8+6i}{2} = 4+3i$$

$$z_4 = \frac{8-6i}{2} = 4-3i$$

$$S_2 = \{4+3i, 4-3i\}$$

$$c/ z_1 + z_3 = 3+4i + 4+3i$$

$$z_1 + z_3 = 7+7i$$

$$|7+7i| = 7\sqrt{2}$$

$$\arg(7+7i) = \pi/4$$

$$z_1 + z_3 = 7\sqrt{2} \left( \cos \frac{\pi}{4} + i \sin \frac{\pi}{4} \right)$$

$$z_1 \times z_3 = (3+4i)(4+3i)$$

$$= 12 + 9i + 16i - 12$$

$$z_1 \cdot z_3 = 25i$$

$$|25i| = 25$$

$$\arg(25i) = \pi/2$$

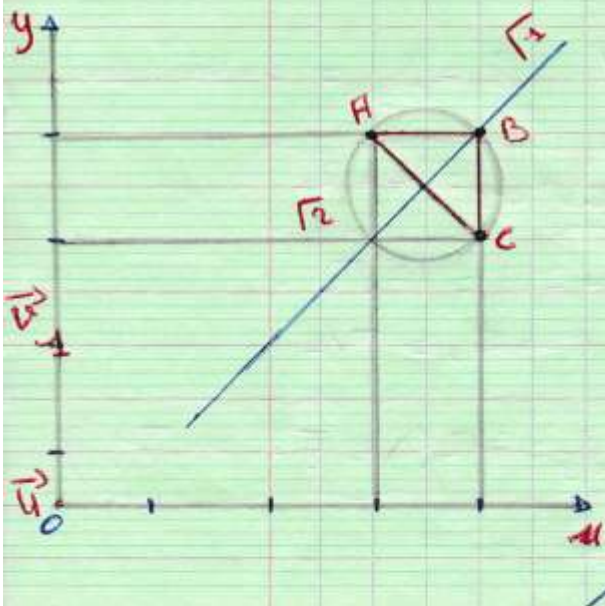
$$z_1 \cdot z_3 = 25 \left( \cos \frac{\pi}{2} + i \sin \frac{\pi}{2} \right)$$

$$2^\circ / f(z) = \frac{z-4-3i}{z-3-4i}$$

$$a) z_A = 3+4i \Rightarrow A(3,4)$$

$$z_B = 4+3i \Rightarrow B(4,3)$$

$$z_C = 4+4i \Rightarrow C(4,4)$$



$$b) / f(4+4i) = \frac{4+4i-4-3i}{4+4i-3-4i}$$

$$f(4+4i) = i$$

On remarque  $f(z)$

$$\frac{z_C - z_B}{z_C - z_A}$$

$$z_C - z_A$$

Alors le triangle ABC est rectangle isocèle en C.

$$c) / \Gamma \in \Gamma_1 \Rightarrow |f(z)| = 1$$

$$\Rightarrow \left| \frac{z - z_B}{z - z_A} \right| = 1$$

$$\Leftrightarrow |z - z_B| = |z - z_A|$$

$$\Rightarrow \Gamma_1 B = \Gamma_1 A$$

$\Rightarrow \Gamma_1$  est la médiatrice du  $\Gamma$  AB

$\Gamma \in \Gamma_2 \Rightarrow f(z)$  est Imaginaire Pur

$\Rightarrow \frac{z - z_B}{z - z_A}$  est imaginaire Pur

$\Rightarrow \Gamma_2$  est le cercle de diamètre (AB) privé de A et B.