

Minitest

Nom :

Prénom :

Ecrire sous la forme algébrique $z_1 = (3 + 2i)^2$ $z_2 = \frac{1+2i}{3+2i}$

$$z_1 = (3 + 2i)^2$$

$$= 3^2 + 2 \times 3 \times 2i + 4i^2$$

$$= 9 + 12i - 4$$

$$= 5 + 12i$$

$$z_2 = \frac{(1+2i)(3-2i)}{(3+2i)(3-2i)}$$

$$= \frac{3 - 2i + 6i - 4i^2}{3^2 + 2^2}$$

$$= \frac{7 + 4i}{13} = \frac{7}{13} + i \cdot \frac{4}{13}$$

Calculer le module et un argument de

$z_1 = 1 + i\sqrt{3}$	$z_2 = -1 + i\sqrt{3}$	$z_3 = 3 + 3i$	$z_4 = \sqrt{2} - i\sqrt{2}$
$z_5 = 5i$	$z_6 = -1 - i$	$z_7 = (1 - i)^2$	$z_8 = 1 + (1 - 2i) \times (4 + i)$

$$z_1 = 1 + i\sqrt{3}$$

$$|z_1| = 2$$

$$\begin{cases} \cos \theta = \frac{a}{r} = \frac{1}{2} \\ \sin \theta = \frac{b}{r} = \frac{\sqrt{3}}{2} \end{cases}$$

d'où $\theta = \frac{\pi}{3}$

$$z_1 = 2e^{i\frac{\pi}{3}}$$

$$z_2 = -1 + i\sqrt{3}$$

$$|z_2| = 2$$

$$\begin{cases} \cos \theta = -\frac{1}{2} \\ \sin \theta = \frac{\sqrt{3}}{2} \end{cases}$$

$\theta = \frac{2\pi}{3}$

$$z_2 = 2e^{i\frac{2\pi}{3}}$$

$$z_3 = 3 + 3i$$

$$|z_3| = \sqrt{3^2 + 3^2}$$

$$= \sqrt{18}$$

$$= 3\sqrt{2}$$

$$\begin{cases} \cos \theta = \frac{\sqrt{2}}{2} \\ \sin \theta = \frac{\sqrt{2}}{2} \end{cases}$$

$\theta = \frac{\pi}{4}$

$$z_3 = 3\sqrt{2}e^{i\frac{\pi}{4}}$$

$$z_4 = \sqrt{2} - i\sqrt{2}$$

$$|z_4| = \sqrt{\sqrt{2}^2 + \sqrt{2}^2}$$

$$= \sqrt{4} = 2$$

$$\begin{cases} \cos \theta = \frac{\sqrt{2}}{2} \\ \sin \theta = -\frac{\sqrt{2}}{2} \end{cases}$$

d'où $\theta = -\frac{\pi}{4}$

$$z_4 = 2e^{-i\frac{\pi}{4}}$$

$$z_5 = 5i$$

$$= 5e^{i\frac{\pi}{2}}$$

$$z_6 = -1 - i$$

$$= \sqrt{2}e^{-i\frac{3\pi}{4}}$$

$$z_7 = (1 - i)^2$$

$$= 1 - 2i + i^2$$

$$= -2i$$

$$= 2e^{-i\frac{\pi}{2}}$$

$$z_8 = 1 + (1 - 2i)(4 + i)$$

$$= 1 + 4 + 2 - 8i + i$$

$$= 7 - 7i$$

$$= 7\sqrt{2}e^{-i\frac{\pi}{4}}$$