

**RAPPELS :****Exponentielle → Algébrique**

$$a = \rho \cdot \cos \theta$$

$$b = \rho \cdot \sin \theta$$

**Algébrique → Exponentielle**

$$|z| = \sqrt{a^2 + b^2} = \rho$$

$$\cos \theta = \frac{a}{|z|}$$

$$\sin \theta = \frac{b}{|z|}$$

**EXERCICE 3A.1****a.** Ecrire sous forme algébrique les nombres suivants :

|                                                                |                                                                        |                                                                |                                                                        |
|----------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------|
| $z_1 = 3e^{i\frac{\pi}{4}}$<br>$a =$<br>$b =$<br>donc $z_1 =$  | $z_2 = 4e^{i\frac{\pi}{2}}$<br>$a =$<br>$b =$<br>donc $z_2 =$          | $z_3 = 7e^{i\pi}$<br>$a =$<br>$b =$<br>donc $z_3 =$            | $z_4 = 2e^{i0}$<br>$a =$<br>$b =$<br>donc $z_4 =$                      |
| $z_5 = 5e^{i\frac{-\pi}{6}}$<br>$a =$<br>$b =$<br>donc $z_5 =$ | $z_6 = \sqrt{2} e^{i\frac{3\pi}{4}}$<br>$a =$<br>$b =$<br>donc $z_6 =$ | $z_7 = 3e^{i\frac{5\pi}{6}}$<br>$a =$<br>$b =$<br>donc $z_7 =$ | $z_8 = \sqrt{3} e^{i\frac{2\pi}{3}}$<br>$a =$<br>$b =$<br>donc $z_8 =$ |

**b.** Ecrire sous forme algébrique les nombres suivants :

$$z_1 = 4e^{i\frac{-\pi}{4}}$$

$$z_2 = 5\sqrt{3}e^{i\frac{-\pi}{6}}$$

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

$$z_4 = 7\sqrt{2}e^{i0}$$

$$z_5 = 2\sqrt{3}e^{i\frac{2\pi}{3}}$$

**EXERCICE 3A.2****a.** Ecrire sous forme exponentielle les nombres suivants :

|                                                      |                                                       |                                                       |                                                                |
|------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------|
| $z_1 = 3$<br>$ z_1  =$<br>$\theta =$<br>donc $z_1 =$ | $z_2 = 2i$<br>$ z_2  =$<br>$\theta =$<br>donc $z_2 =$ | $z_3 = -5$<br>$ z_3  =$<br>$\theta =$<br>donc $z_3 =$ | $z_4 = -\sqrt{2} i$<br>$ z_4  =$<br>$\theta =$<br>donc $z_4 =$ |
|------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------|

**b.** Ecrire sous forme exponentielle les nombres suivants :

|                                                                                                     |                                                                                                      |                                                                                                             |                                                                                                              |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| $z_1 = 1 + i$<br>$ z_1  =$<br>$\cos \theta =$<br>$\sin \theta =$<br>donc $\theta =$<br>donc $z_1 =$ | $z_2 = 3 - 3i$<br>$ z_2  =$<br>$\cos \theta =$<br>$\sin \theta =$<br>donc $\theta =$<br>donc $z_2 =$ | $z_3 = 1 + i\sqrt{3}$<br>$ z_3  =$<br>$\cos \theta =$<br>$\sin \theta =$<br>donc $\theta =$<br>donc $z_3 =$ | $z_4 = 2\sqrt{3} - 2i$<br>$ z_4  =$<br>$\cos \theta =$<br>$\sin \theta =$<br>donc $\theta =$<br>donc $z_4 =$ |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

**c.** Ecrire sous forme exponentielle les nombres suivants :

$$z_1 = \frac{3}{2} - i\frac{\sqrt{3}}{2}$$

$$z_2 = -\frac{3}{2} - 3i\frac{\sqrt{3}}{2}$$

$$z_3 = 5\sqrt{2} - 5i\sqrt{2}$$

$$z_4 = 5 + 3i^{(*)}$$

$$z_5 = 2 + 7i^{(*)}$$

(pour les  $(*)$ , on donnera une approximation en radians de l'angle  $\theta$ )