



Exercícios: Operações na forma trigonométrica

Expresse na forma trigonométrica o produto $z_1 z_2$:

1.

$$z_1 = 3 \left(\cos \frac{\pi}{5} + i \operatorname{sen} \frac{\pi}{5} \right)$$

$$z_2 = 4 \left(\cos \frac{2\pi}{5} + i \operatorname{sen} \frac{2\pi}{5} \right)$$

2.

$$z_1 = 6 \left(\cos \frac{3\pi}{10} + i \operatorname{sen} \frac{3\pi}{10} \right)$$

$$z_2 = 5 \left(\cos \frac{2\pi}{10} + i \operatorname{sen} \frac{2\pi}{10} \right)$$

3.

$$z_1 = 5(\cos 30^\circ + i \operatorname{sen} 30^\circ)$$

$$z_2 = 2(\cos 60^\circ + i \operatorname{sen} 60^\circ)$$

4. Calcule $z_1 z_2 z_3$, sendo dados:

$$z_1 = 2 \left(\cos \frac{\pi}{5} + i \operatorname{sen} \frac{\pi}{5} \right); z_2 = \sqrt{3} \left(\cos \frac{3\pi}{5} + i \operatorname{sen} \frac{3\pi}{5} \right)$$

$$\text{e } z_3 = 2\sqrt{3} \left(\cos \frac{6\pi}{5} + i \operatorname{sen} \frac{6\pi}{5} \right).$$

Dado $z = \sqrt{2} \left(\cos \frac{\pi}{4} + i \operatorname{sen} \frac{\pi}{4} \right)$, calcule as potências:

5. $z^2 =$

6. $z^5 =$

Calcule:

7. $(1 + i)^8 =$

8. $(-1 + \sqrt{3}i)^3 =$

Gabarito:

1. $12 \left(\cos \frac{3\pi}{5} + i \operatorname{sen} \frac{3\pi}{5} \right)$

2. $30 \left(\cos \frac{\pi}{2} + i \operatorname{sen} \frac{\pi}{2} \right)$

3. $10i$

4. 12

5. $2i$

6. $-4 - 4i$

7. 16

8. 8

Dados:

$$Z = 6 \left(\cos \frac{5\pi}{6} + i \operatorname{sen} \frac{5\pi}{6} \right); W = 3 \left(\cos \frac{\pi}{4} + i \operatorname{sen} \frac{\pi}{4} \right)$$

Calcule:

9. $\frac{Z}{W}$

10. $\frac{W}{Z}$