

Exercice

Calculer le module de chacun des nombres suivants:

1. $z_1 = 2 - i$

2. $z_2 = 3 + 4i$

3. $z_3 = 7 - i$

4. $z_4 = -4 + 3i$

5. $z_5 = \sqrt{7} + i\sqrt{5}$

6. $z_6 = (1 + i)^4$

7. $z_7 = (-3 + 5i)^2$

8. $z_8 = (1 - \sqrt{3}i)(\sqrt{11} - 5i)$

9. $z_9 = \frac{4 - 3i}{3 - 4i}$

Correction :

1. $z_1 = 2 - i$

$$|z_1|^2 = 2^2 + (-1)^2 = 5$$

$$|z_1| = \sqrt{5}$$

2. $z_2 = 3 + 4i$

$$|z_2|^2 = 3^2 + 4^2 = 9 + 16 = 25$$

$$|z_2| = 5$$

3. $z_3 = 7 - i$

$$|z_3|^2 = 7^2 + (-1)^2 = 49 + 1 = 50$$

$$|z_3| = 5\sqrt{2}$$

4. $z_4 = -4 + 3i$

$$|z_4|^2 = (-4)^2 + 3^2 = 16 + 9 = 25$$

$$|z_4| = 5$$

5. $z_5 = \sqrt{7} + i\sqrt{5}$

$$|z_5|^2 = (\sqrt{7})^2 + (\sqrt{5})^2 = 7 + 5 = 12$$

$$|z_5| = 2\sqrt{3}$$

6. $z_6 = (1 + i)^4$

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

$$z_6 = (2i)^2 = -4$$

$$|z_6| = 4$$

7. $z_7 = (-3 + 5i)^2$

$$|z_7| = |(-3 + 5i)^2|$$

$$|z_7| = |-3 + 5i|^2$$

$$|z_7| = 9 + 25 = 34$$

$$\boxed{|z_7| = 34}$$

$$8. z_8 = (1 - \sqrt{3}i)(\sqrt{11} - 5i)$$

$$|1 - \sqrt{3}i|^2 = 1^2 + (-\sqrt{3})^2 = 1 + 3 = 4$$

$$|1 - \sqrt{3}i| = 2$$

$$|\sqrt{11} - 5i|^2 = (\sqrt{11})^2 + (-5)^2 = 11 + 25 = 36$$

$$|\sqrt{11} - 5i| = 6$$

$$|z_8| = |1 - \sqrt{3}i| \times |\sqrt{11} - 5i|$$

$$\boxed{|z_8| = 2 \times 6 = 12}$$

$$9. z_9 = \frac{4 - 3i}{3 - 4i}$$

$$|z_9| = \left| \frac{4 - 3i}{3 - 4i} \right| = \frac{|4 - 3i|}{|3 - 4i|}$$

$$|4 - 3i|^2 = 4^2 + (-3)^2 = 16 + 9 = 25$$

$$|4 - 3i| = 5$$

$$|3 - 4i|^2 = 3^2 + (-4)^2 = 9 + 16 = 25$$

$$|3 - 4i| = 5$$

$$\boxed{|z_9| = \frac{5}{5} = 1}$$