

Se $z = 3 + 4i$ e $w = -1 + i$, allora $z + w = ?$

1 $3 + 3i$ 0% 0

2 $-3 + 4i$ 0% 0

3 $2 + 5i$ ✓ 0% 0

4 $4 + 5i$ 0% 0

$$\begin{aligned}(3+4i) + (-1+i) &= \\ &= (3+(-1)) + (4+1)i \\ &= 2 + 5i\end{aligned}$$

poiché $(a+bi) + (c+di) = (a+c) + (b+d)i$

Se $z = 3 + 4i$ e $w = -1 + i$, allora $zw = ?$

1 $-3 + 4i$ 0% 0

2 $-7 - i$ ✓ 0% 0

3 -7 0% 0

4 $4 - 3i$ 0% 0

$$\begin{aligned}(3+4i)(-1+i) &= \\ &= 3(-1) + (4i)i + 4i(-1) + 3i \\ &= -3 + 4i^2 - 4i + 3i \\ &= -3 - 4 - i \\ &= -7 - i\end{aligned}$$

poiché $(a+bi)(c+di) = (ac-bd) + (bc+ad)i$

Se $z = 3 - 4i$, allora $|z| = ?$

1 7 0% 0

2 5 ✓ 0% 0

3 4 0% 0

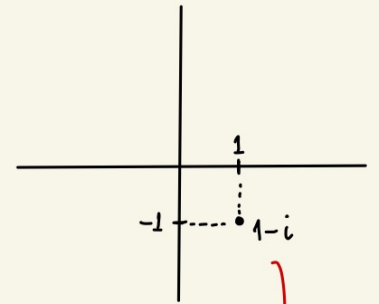
4 i 0% 0

$$\begin{aligned}|3-4i| &= \sqrt{3^2 + (-4)^2} \\ &= \sqrt{9 + 16} \\ &= \sqrt{25} = 5\end{aligned}$$

poiché $|a+bi| = \sqrt{a^2 + b^2}$

Come posso scrivere $z = 1 - i$ in forma trigonometrica?

- 1 $z = \cos(\pi/4) + i\sin(\pi/4)$ 0% 0
- 2 $z = \sqrt{2}(\cos(\pi/4) + i\sin(\pi/4))$ 0% 0
- 3 $z = \cos(3\pi/4) + i\sin(3\pi/4)$ 0% 0
- 4 $z = \sqrt{2}(\cos(3\pi/4) + i\sin(3\pi/4))$ 0% 0
- 5 $z = \cos(7\pi/4) + i\sin(7\pi/4)$ 0% 0
- 6 $z = \sqrt{2}(\cos(7\pi/4) + i\sin(7\pi/4))$ 0% 0 ✓



quarto quadrante

$\arctan \frac{-1}{1} = \arctan(-1) \rightsquigarrow$ il valore dell'argomento potrebbe essere $3\pi/4$ oppure $7\pi/4$. Siccome siamo nel quarto quadrante, allora l'argomento è $7\pi/4$.

$$|z| = \sqrt{1^2 + (-1)^2} = \sqrt{2}.$$

Ricordiamo alcuni valori di $\sin$, $\cos$, $\tan$:

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
0	0	1	0
$\pi/6$	$1/2$	$\sqrt{3}/2$	$\sqrt{3}/3$
$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1
$\pi/3$	$\sqrt{3}/2$	$1/2$	$\sqrt{3}$
$\pi/2$	1	0	non-definita

$-2e^{i\pi/3} = ?$

① $-1 - \sqrt{3}i$ ✓ 0% 0

② $-1 - \sqrt{2}i$ 0% 0

③ $1 + \sqrt{3}i$ 0% 0

④ $1 + \sqrt{2}i$ 0% 0

$$\begin{aligned}
 -2e^{i\pi/3} &= \\
 &= -2\left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}\right) \\
 &= -2\left(\frac{1}{2} + i \frac{\sqrt{3}}{2}\right) \\
 &= -1 - \sqrt{3}i
 \end{aligned}$$

Attenzione $|-2e^{i\pi/3}| = ?$

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

Come scrivere $-2e^{i\pi/3}$ nella forma $r e^{i\theta}$ con $r = |z|$?

$$\begin{aligned}
 -2e^{i\pi/3} &= (-1)2e^{i\pi/3} = e^{i\pi} \cdot 2 \cdot e^{i\pi/3} \\
 &= 2e^{i(\pi + \pi/3)} \\
 &= 2e^{i4\pi/3}
 \end{aligned}$$