

Complex Number- Supplement Solution Set

See If You Need This Video!

1. Answer: C.

1. It is the definition of i .
2. -1 has 0 imaginary part, it is purely real.
3. $4i$ has 0 real part, it is purely imaginary.
4. $2 + i$ has both non-zero real and imaginary parts, it is a complex number.

To avoid confusion, complex number includes all points on eigenplane (including purely real and purely imaginary numbers).

«Basic idea of complex number»

Episode 1- Cantonese: 0:10 English: 0:04 Putonghua: 0:10

«Real or imaginary part of complex number»

Episode 1- Cantonese: 2:55 English: 3:06 Putonghua: 3:05

2. Answer: B.

1. Yes, $\operatorname{Re}(z) = 1$
2. Be careful, $\operatorname{Im}(z) = -\sqrt{3}$, imaginary part is the coefficient of i , i is not included.
3. $|z| = \sqrt{(\operatorname{Re}(z))^2 + (\operatorname{Im}(z))^2} = \sqrt{1^2 + (\sqrt{3})^2} = 2$
4. $\operatorname{Arg}(z) = -\pi/3$, draw a picture for z if you cant imagine.

«Basic idea of complex number»

Episode 1- Cantonese: 0:10 English: 0:04 Putonghua: 0:10

«Argument and modulus of complex number»

Episode 1- Cantonese: 3:30 English: 4:05 Putonghua: 3:46

«Real or imaginary part of complex number»

Episode 1- Cantonese: 2:55 English: 3:06 Putonghua: 3:05

3. Answer: C.

If $z = a + bi$

Where a, b are real numbers.

Then $a^* = a - bi$

So only 2, 3 are correct.

«Complex conjugate of complex number»

Episode 1- Cantonese: 4:36 English: 5:17 Putonghua: 4:55

4. Answer: E.

1. Addition or subtraction by components.
2. $AB = (a_1b_1 - a_2b_2) + (a_1b_2 + a_2b_1)i$
3. It is correct and useful, you may check this with 2 above.
4. This is how we perform division with complex number in denominator.

«Basic algebra of complex number»

Episode 1- Cantonese: 5:02 English: 5:50 Putonghua: 5:26

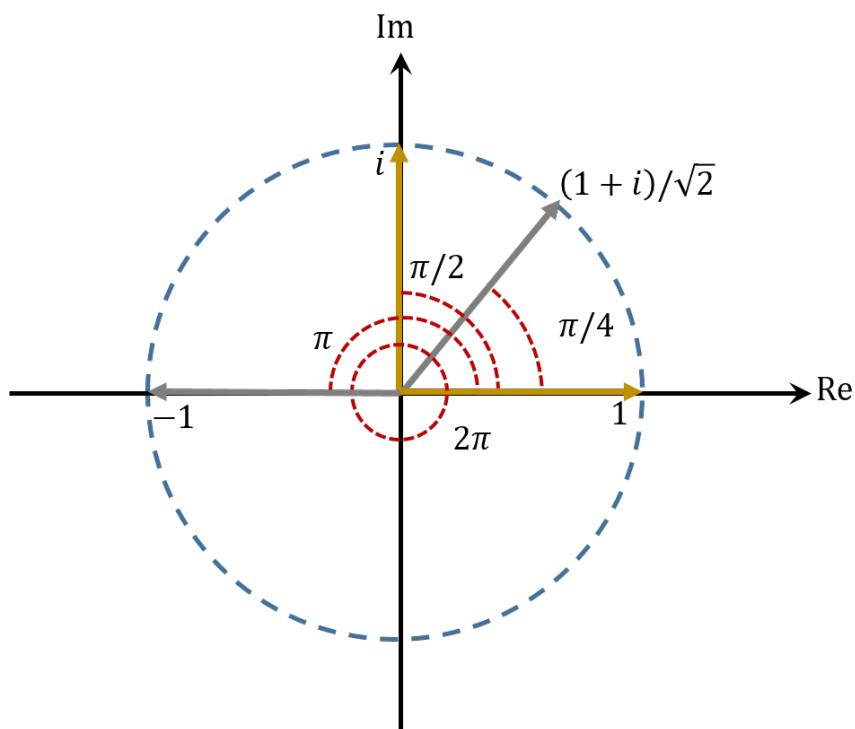
5. Answer: D.

Don't forget the modulus r and the i in the index of e .

«Exponential form of complex number»

Episode 2- Cantonese: 0:55 English: 0:50 Putonghua: 1:10

6. Answer: E.



«Exponential form of complex number»

Episode 2- Cantonese: 0:55 English: 0:50 Putonghua: 1:10

7. Answer: D.

Just like multiplying real numbers, a , b , $e^{i\alpha}$, $e^{i\beta}$ are just factors.

«Exponential form of complex number»

Episode 2- Cantonese: 0:55 English: 0:50 Putonghua: 1:10

8. Answer: C.

This power index θ of the exponential function $e^{i\theta}$ is also called a phase.

The phase of A is $\omega t + \pi/2$, B is ωt .

A 's phase is $\pi/2$ larger than B 's phase.

«Idea of phase and complex number»

Episode 2- Cantonese: 3:15 English: 2:48 Putonghua: 3:32