

Algebra 2 · Real and Complex Numbers · Quiz

Common Core N-RN.A.1, N-RN.A.2, N-CN.A.1, N-CN.A.2 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

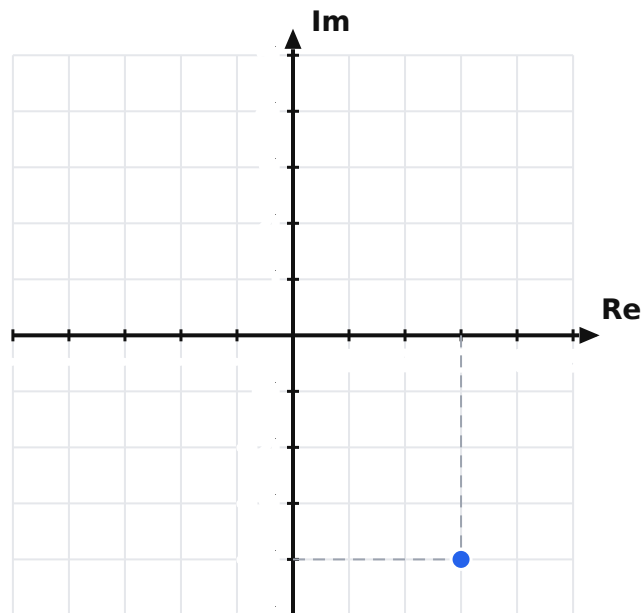
Ten multiple-choice questions on real and complex numbers: reading the complex plane, square roots of negative numbers, adding and multiplying $a + bi$, and powers of i . Pick the single best answer, then read the explanation to learn the common mistake.

Algebra 2 Common Core: **N-RN.A.1 · N-RN.A.2 · N-CN.A.1 · N-CN.A.2**

Questions

Question 1

Which complex number is plotted?



A point in the complex plane.

- A. $-3+4i$
- B. $3-4i$
- C. $4-3i$
- D. $3+4i$

Question 2

What is $\sqrt{-36}$?

- A. $-6i$
- B. 6
- C. $6i$
- D. -6

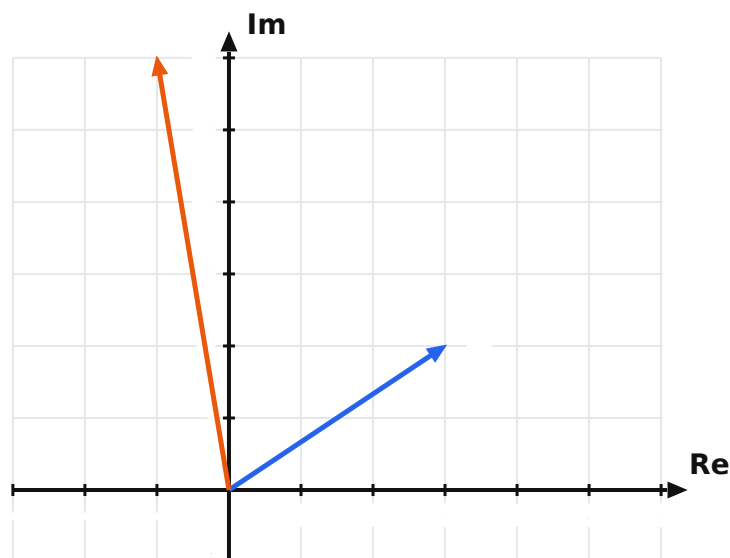
Question 3

Which number is irrational?

- A. $\sqrt{49}$
- B. $\sqrt{18}$
- C. $\frac{22}{7}$
- D. -0.75

Question 4

The arrows show $3+2i$ and $-1+6i$. What is their sum?



The two arrows.

- A. $4+8i$
- B. $2+4i$
- C. $2+8i$
- D. $2-8i$

Question 5

What is $(2+i)(3-4i)$?

- A. $6-5i$
- B. $2-5i$
- C. $10+5i$
- D. $10-5i$

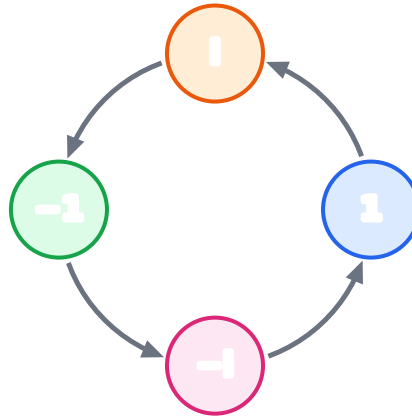
Question 6

What is i^{23} ?

- A. i
- B. -1
- C. $-i$
- D. 1

Question 7

Use the cycle to simplify i^{50} .



The cycle of powers of i .

- A. -1
- B. 1
- C. i
- D. $-i$

Question 8

What are the real part and the imaginary part of $7-4i$?

- A. Real part -4 , imaginary part 7
- B. Real part 7 , imaginary part -4
- C. Real part 7 , imaginary part 4
- D. Real part 7 , imaginary part $-4i$

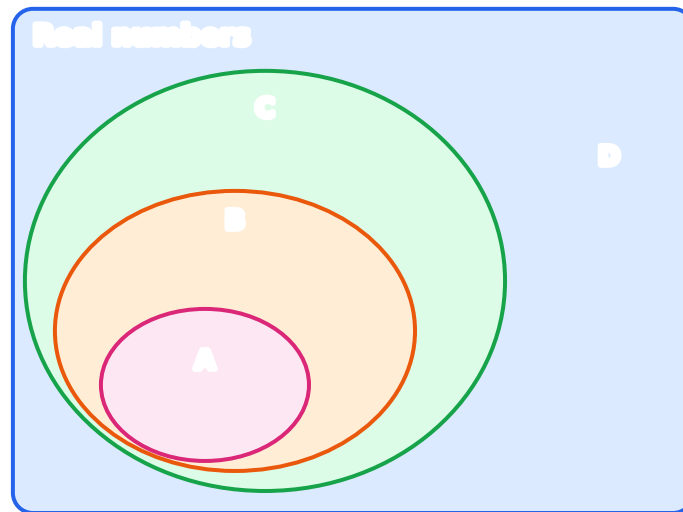
Question 9

What is $(5+3i)(5-3i)$?

- A. 16
- B. 25
- C. $34i$
- D. 34

Question 10

Region A holds the natural numbers, B the integers, C the rational numbers and D the irrational numbers. In which region is the smallest set containing $\sqrt{73}$?



Regions A, B, C and D.

- A. Region C
- B. Region A
- C. Region B
- D. Region D

Answer key

1. **B** - The point is 3 units right and 4 units down, so the real part is 3 and the imaginary part is -4 . Swapping the parts gives $4-3i$.
2. **C** - Write $\sqrt{-36} = i\sqrt{36} = 6i$. The square root of a negative number is never a real number.
3. **B** - $\sqrt{18} = 3\sqrt{2}$ has a non-repeating, non-terminating decimal. $\sqrt{49} = 7$, $\frac{22}{7}$ and -0.75 are rational.
4. **C** - Add real parts: $3+(-1)=2$. Add imaginary parts: $2i+6i=8i$. Adding 3 and 1 is a sign slip.
5. **D** - $6-8i+3i-4i^2 = 6-5i+4 = 10-5i$. Forgetting to replace i^2 gives $6-5i$.
6. **C** - $23 = 4(5) + 3$, so $i^{23} = i^3 = -i$. The remainder tells which power of the cycle to use.
7. **A** - $50 = 4(12) + 2$, so $i^{50} = i^2 = -1$. A remainder of 0 would give 1.
8. **B** - In $a+bi$ the imaginary part is the real number b , here -4 , without the i .
9. **D** - $25-9i^2 = 25+9 = 34$. Treating i^2 as 1 gives 16.
10. **A** - $-\frac{73}{1}$ is a quotient of integers but not an integer, so it is rational only. It is not natural or an integer, and it is not irrational.

Remember:

- A complex number is $a + bi$ with real a and b , and $i^2 = -1$.
- Every real number is a complex number with $b = 0$.
- Add or subtract real parts and imaginary parts separately.
- To multiply, distribute and then replace i^2 by -1 .
- The powers of i cycle through i , -1 , $-i$, 1 every four exponents.