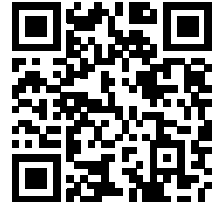


name: _____

class: _____

date: _____

Complex Numbers



Complex numbers, a fundamental _____ in mathematics, are composed of two parts: a real part and an imaginary part. A complex number is often written in the form $a + bi$, where a and b are real numbers, and i is the imaginary unit, defined as the square root of -1 . This unique _____ allows complex numbers to perform operations that real numbers cannot, like finding the square _____ of a negative number.

One of the most important properties of complex numbers is their _____ to represent points on a two-dimensional plane, known as the complex plane. In this plane, the horizontal _____ represents the real part, and the vertical axis represents the imaginary part. For example, the complex number $3 + 4i$ would be plotted at the point $(3, 4)$.

Another key aspect of complex numbers is their _____. The conjugate of a complex number is formed by changing the sign of the imaginary part. So, the conjugate of $3 + 4i$ is $3 - 4i$. Conjugates are important in various operations, such as simplifying the division of complex numbers.

Complex numbers also have a _____, or modulus, which is their distance from the origin in the complex plane. The modulus of a complex number is calculated using the Pythagorean theorem. For $3 + 4i$, its modulus is 5, as it forms a right-angled triangle with sides of length 3 and 4.

In addition to their geometric _____, complex numbers play a crucial role in many areas of science and engineering. For instance, they are used in electrical engineering _____ to represent alternating currents and in quantum physics to describe the state of particles.

The concept of complex numbers may seem _____ at first, but their applications are vast and concrete. From solving polynomial equations to modeling waves, complex numbers are a powerful _____ in the world of mathematics and beyond.

axis	concept	structure	abstract	magnitude	conjugate	interpretation	
ability	conjugate	form	tool	Pythagorean	engineering	number	root