Complex Numbers

What happens when the discriminant is negative.

10th Grade

i is defined as the square root of −1. A complex number has a real part and an imaginary part.

$$i^2 = -1 \cdot a + bi$$

√(−9) → **3i**

√9 × √(−1).

i^2 → **−1**

By definition.

(2 + 3i) + (1 − i) → **3 + 2i**

Add real to real, imaginary to imaginary.

(2 + 3i)(1 − i) → **5 + i**

FOIL, then replace i^2 with −1.

THE COMMON MISTAKE

× **√(−9) = −3**

✓ **√(−9) = 3i**

A negative under the root does not make the answer negative — it makes it imaginary.

i cycles: i, −1, −i, 1, then repeats. Divide the exponent by 4 and use the remainder.