

Algebra /

Using i to rewrite square roots of negative numbers

Handwritten notes illustrating the process of rewriting square roots of negative numbers using the imaginary unit i .

Top Left: Prime factorization of 72: $\sqrt{-72}$ with factors 2, 2, 2, 3, 3, 3. The prime factorization is shown as $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3$.

Top Middle: Prime factorization of 72: $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 = 72$. Below it, $2 \cdot 3 \sqrt{2}$ is shown, leading to $6\sqrt{2}i$ or $6i\sqrt{2}$.

Top Right: Definition of i : $i = \sqrt{-1}$. Below it, $i^2 = \sqrt{-1}^2 = -1$. To the right, it says "complex numbers $a+bi$ ".

Bottom Left: Simplification of $\sqrt{-16}$: $\sqrt{-16} = 4i$. Below it, $\sqrt{16} \sqrt{-1} = 4i$ is shown.

Bottom Right: Simplification of $-\sqrt{-63}$: $-\sqrt{-63}$ with factors 3, 3, 7. Below it, $-3i\sqrt{7}$ is shown.