Name _____ Date _____

Simplifying Complex Numbers - Guided Lesson Explanation

Explanation # 1

Solve $\sqrt{64} + \sqrt{-49}$

The step that goes through the third "equals" sign is " $\sqrt{1} = 1$ ", not "$\sqrt{-1} = \sqrt{i}$". The i is outside the radical.)

$\sqrt{64} + \sqrt{-49}$

$\sqrt{64} + \sqrt{49 \times -1}$

$\sqrt{64} + \sqrt{49} \times i$

$8 + 7i$

Answer is: $8 + 7i$

Explanation # 2

The step that goes through the third "equals" sign is " $\sqrt{1} = 1$ ", not "$\sqrt{-1} = \sqrt{i}$". The i is outside the radical.)

$i = \sqrt{-1}$

$i^3 = \sqrt{-1} \times \sqrt{-1} \times \sqrt{-1}$

$i^3 = -1 \times \sqrt{-1}$

$i^3 = -1 \times i$

$i^3 = -i$

Answer is: $-i$

Explanation # 3

Step 2) An 'imaginary number' is a quantity of the form ix, where x is a real number and i is the positive square root of -1.

$\sqrt{-25} =$

$= \sqrt{25(-1)}$

$= \sqrt{25} \times i$

$= 5i$