What does each ask for?

$\pm\sqrt{25}$ both positive and negative square roots of 25

$-\sqrt{36}$ only the negative square root of 36

$\sqrt{49}$ only the positive square root of 49

Simplify. $\sqrt{729}$

$\sqrt{729} = 27$

When there are two roots of a number the radical symbol $\sqrt{\ }$ without anything in front means

The Prinicpal Square Root
(the positive square roots)

Solve.

$x^2 = 676$

$\sqrt{x^2} = \sqrt{676}$

$x = \pm 26$

Simplify.

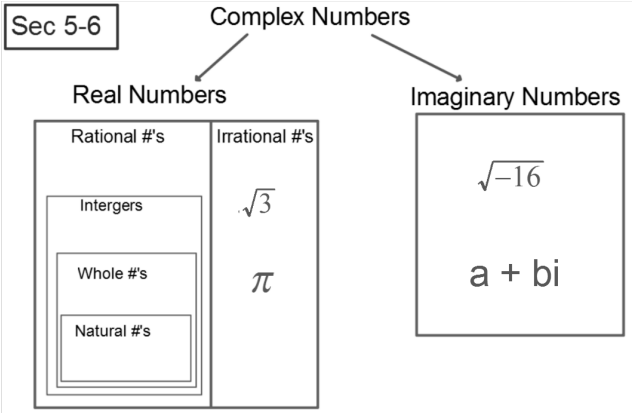
$\sqrt{72}$

$= \sqrt{36 \cdot 2}$

$= \sqrt{36} \cdot \sqrt{2}$

$= 6\sqrt{2}$

Sec 5-6



Imaginary Numbers:

$$\sqrt{-1} = i$$

i is called the imaginary unit.

Simplify each.

1. $\sqrt{20}$

$= \sqrt{4 \cdot 5}$

$= \sqrt{4} \cdot \sqrt{5}$

$= 2\sqrt{5}$

2. $\sqrt{-16}$

$= \sqrt{-1 \cdot 16}$

$= \sqrt{-1} \cdot \sqrt{16}$

$= 4i$

Get:

- a small white board
- dry-erase marker
- rag to wipe board

Find ALL EXACT Complex solutions.

1. $3x^2 + 23 = 11$

$-23 \quad -23$

$\frac{3x^2}{3} = \frac{-12}{3}$

$\sqrt{x^2} = \sqrt{-4} = \sqrt{-1 \cdot 4}$

$x = \pm 2i$

2. $7(x-5)^2 + 134 = 8$

$-134 \quad -134$

$\frac{7(x-5)^2}{7} = \frac{-126}{7}$

$\sqrt{(x-5)^2} = \sqrt{-18}$

$x - 5 = \sqrt{-1 \cdot 9 \cdot 2}$

$x - 5 = \pm 3i\sqrt{2}$

$+5 \quad +5$

$x = 5 \pm 3i\sqrt{2}$

Simplify each.

1. $\sqrt{75}$

$= \sqrt{25 \cdot 3}$

$= 5\sqrt{3}$

2. $\sqrt{-1849}$

$= \sqrt{-1 \cdot 1849}$

$= 43i$

3. $\sqrt{-24}$

$= \sqrt{-1 \cdot 4 \cdot 6}$

$= 2i\sqrt{6}$

Simplify each.

1. $\sqrt{-98}$
$= \sqrt{-1 \cdot 49 \cdot 2}$
$= 7i\sqrt{2}$

2. $\sqrt{-256}$
$= \sqrt{-1 \cdot 256}$
$= 16i$

3. $\sqrt{-39}$
$= \sqrt{-1 \cdot 39}$
$= i\sqrt{39}$

4. $5\sqrt{-18}$
$= 5 \cdot \sqrt{-1 \cdot 9 \cdot 2}$
$= 5 \cdot 3 \cdot i\sqrt{2}$
$= 15i\sqrt{2}$

Complex Numbers:

any number that can be written in the form: a + bi → Standard Form of a Complex Number

Real Part — Imaginary Part

Examples of Imaginary #'s:

10 - 7i or 13i

Complex Numbers

a + bi a and b are real numbers

Real Numbers	Imaginary Numbers
b must be 0	$b \neq 0$ a can be any real number - even 0