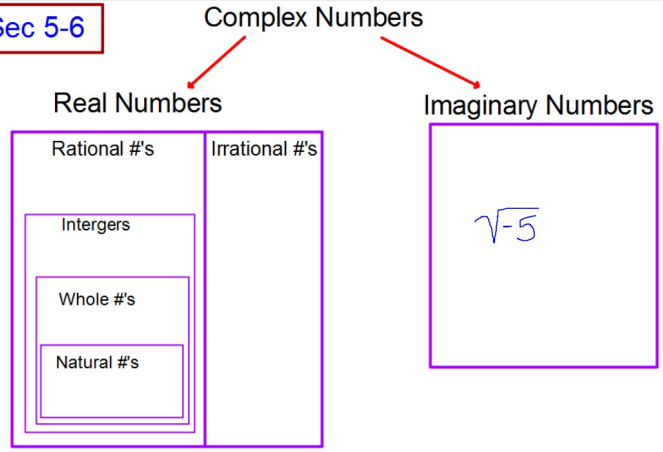
Sec 5-6



Imaginary Numbers:

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

i is called the imaginary unit.

Simplify each.

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

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

3. $\sqrt{-39}$ $i\sqrt{39}$

4. $5\sqrt{-18}$ $\sqrt{9 \cdot 2}$ $5i3\sqrt{2}$ $15i\sqrt{2}$

Complex Numbers:

any number that can be written in the form: a + bi (a and b can be any real #)

Standard Form of a Complex Number

Real Part

Imaginary Part

Real Number: when b=0

Imaginary Number: when b≠0 (a may or may not be zero)

Examples of Imaginary #'s: 10 - 7i or 13i

The terms Complex Number and Imaginary Number are quite often used interchangeably.

notes

$a+bi$

Write each as a Complex Number in Standard Form

1. $2+\sqrt{-9}$

$2+3i$

2. $\sqrt{-12}-5$

$2i\sqrt{3}-5$

$-5+2i\sqrt{3}$

Simplify each expression:

1. $(6-\sqrt{-64})+(5+\sqrt{-49})$

$(6-8i)+(5+7i)=11-i$

2. $(-11+\sqrt{-9})-(6-\sqrt{-144})$

$(-11+3i)-(6-12i)$

$-17+15i$

$i=\sqrt{-1}$

$i^2=(\sqrt{-1})^2=-1$

Simplify each:

1. $4i(3+6i)$

$12i+24i^2$

$12i+24(-1)$

$12i-24$

$=-24+12i$

2. $(2+3i)(1-5i)$

	2	$+3i$
1	2	$+3i$
$-5i$	$-10i$	$-15i^2$ $-15(-1)$ $=+15$

$17-7i$

Simplify:

$(1+5i)^2$

$1^2+10i+25i^2$

$25(-1)$

$1+10i-25$

$-24+10i$

$(4+2i)(4-2i)$

$16-4i^2$

$16-4(-1)$

$16+4$

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