3/9/2022

WeBWork Set: Simplifying Radicals

#5) $\sqrt{36a^2b^3} = \sqrt{36a^2b^2} \cdot \sqrt{b}$

$\boxed{= 6ab\sqrt{b}}$

Since the index = 2 → square root

"hunt" for perfect squares

Multiplying Radicals

#3) $(5a\sqrt{b})(3\sqrt{ab})$

$= 5 \cdot 3 \cdot a\sqrt{b} \cdot \sqrt{ab}$

Note: $\sqrt{b^2} = |b|$

$= 15a\sqrt{ab^2}$

$\boxed{= 15a|b|\sqrt{a}}$

absolute value.

Radical Equations:

#4) Solve: $\sqrt{4x+80} + 8 = 0$

First Thing: Rewrite the equation so it looks like "$\sqrt{} = a$"

i.e. isolate the radical.

$\sqrt{4x+80} = -8$ square both sides to "Kill" the radical

$\left(\sqrt{4x+80}\right)^2 = (-8)^2$

$4x+80 = 64$ ⟵ solve it!

$\quad -80 \quad -80$

$\frac{4x}{4} = \frac{-16}{4}$

$\boxed{x = -4}$ ⟶ a potential solution!

$\sqrt{4x+80} + 8 = 0$

Must check in original ⟶ $\sqrt{4(-4)+80} + 8 \stackrel{?}{=} 0$

No Solutions

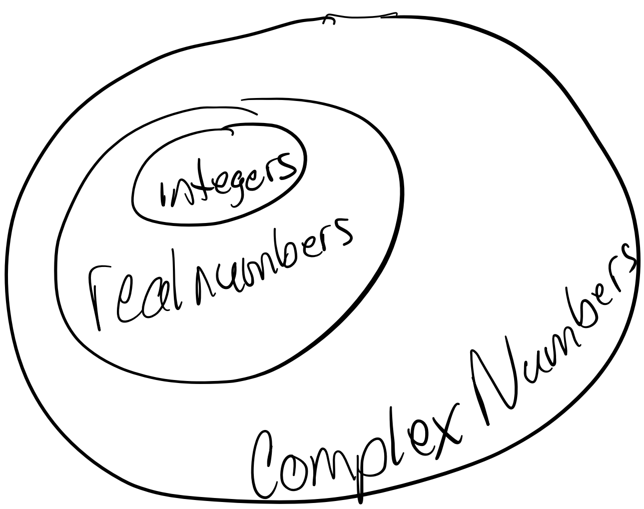
$\sqrt{-16+80}+8 \stackrel{?}{=} 0$

$\sqrt{64}+8=0$

$8+8 \stackrel{?}{=} 0$

No!!

Class Agenda 15: Complex Numbers



Rational Number can be written as ratios of whole numbers

Define:

$\sqrt{-1} = i$

imaginary

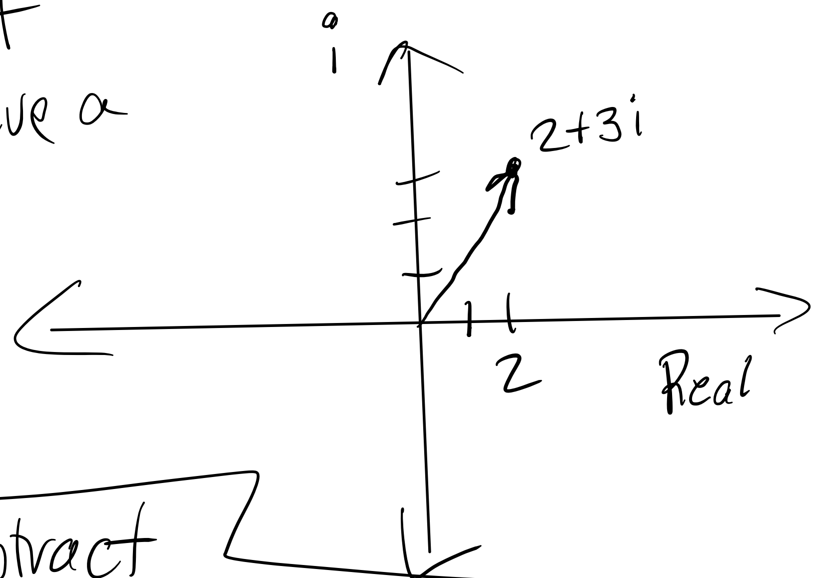
Ex irrational numbers: π, $\sqrt{2}$

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

Standard form of complex number:

$a+bi$ where a & b are real numbers and $b \neq 0$

* if $b=0$ then we have a real #
* if $b \neq 0$ but $a=0$ → still have a complex #



Ex $2+3i$

How do Add/Subtract & Multiply/Divide Complex #'s ?
& take powers of

Ex $(2+3i)+(-1+4i) = (2-1)+(3+4)i$

$= 1+7i$

Ex $(2+3i)-(-1+4i)=3-i$

$(2+3i)+(1-4i) = (2+1)+(3-4)i$
$\boxed{=3-i}$

multiply

Ex $(2+3i)(-1+4i) = -2+8i-3i+12i^2$

FOIL

$\boxed{i^2=-1}$

$= -2+5i+12(-1)$
$\boxed{=-14+5i}$

Ex $(5-2i)(5+2i) = 29$
$= 25+\cancel{10i}-\cancel{10i}-4i^2 = 25-4(-1)$
$= 25+4 = 29$

Ex $(3i+1)(-2i-1) =$
$\boxed{-6i^2-3i-2i-1 = -6(-1)-5i-1 = 5-5i}$

Ex $\dfrac{3(i+2)}{2}$ write in standard form "a+bi"

$= \dfrac{3i+6}{2} = \dfrac{3}{2}i+3 \rightarrow \boxed{3+\dfrac{3}{2}i}$

Ex $\dfrac{1+3i}{-3+2i}$

multiply by
"complex conjugate

$$\frac{(1+3i)}{(-3+2i)} \cdot \frac{(-3-2i)}{(-3-2i)} =$$

FOIL num +
denom.

Reminder:

$$\frac{1}{3+\sqrt{5}} \cdot \frac{(3-\sqrt{5})}{(3-\sqrt{5})}$$

multiply
by conjugate