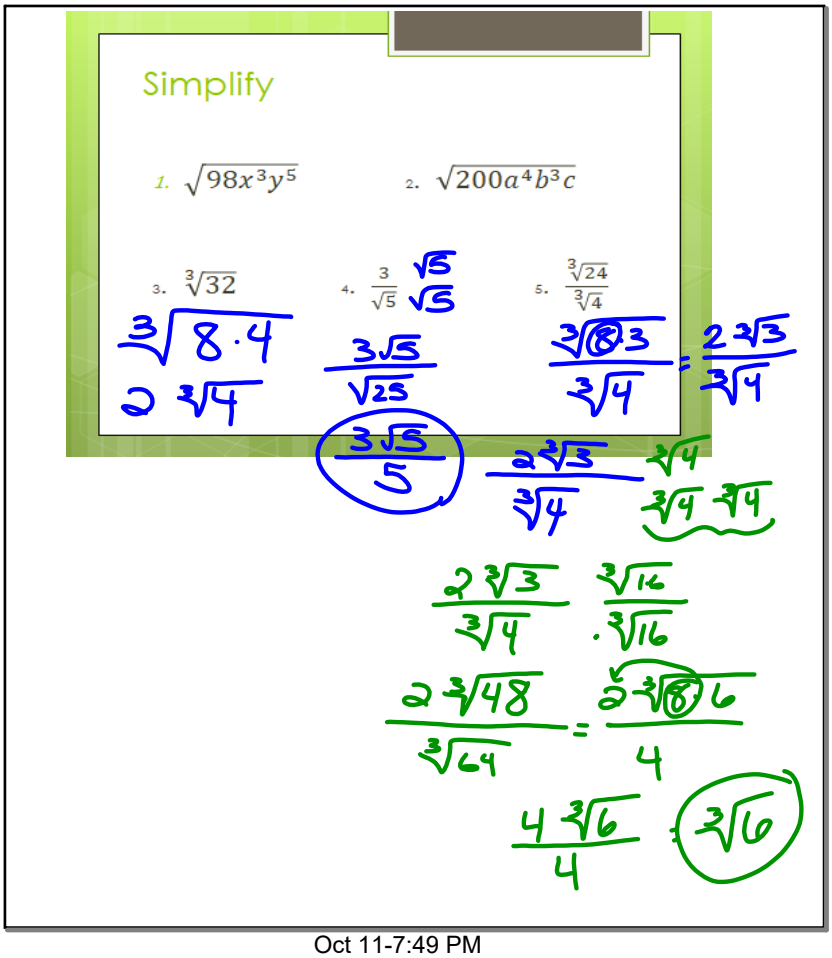

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The Complex Number System

$\sqrt{-4}$

Imaginary # or Complex #

$\sqrt{4}$: 2 or -2

b/c $2 \cdot 2$

$-2 \cdot -2$

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Complex Numbers

- A # in the form of $a+bi$ where a represents a real # and the bi represents the imaginary #
- Imaginary #s are sq. rts. of negative #s

$i = \sqrt{-1}$

$i^2 = ?\ -1$

$\sqrt{-1 \cdot 4}$ $-2i$

$\sqrt{-1 \cdot 5}$

$2i\sqrt{5}$

$i^3 = i^2 \cdot i = -i$

$-1 \cdot i$

$i^4 = i^2 \cdot i^2 = 1$

$i^5 = i^4 \cdot i = i$

$i^6 = i^3 \cdot i^3 = -1$

$-i \cdot -i$

$i^7 = i^3 \cdot i^2 \cdot i^2 = -i$

$-i \cdot -1 \cdot -1$

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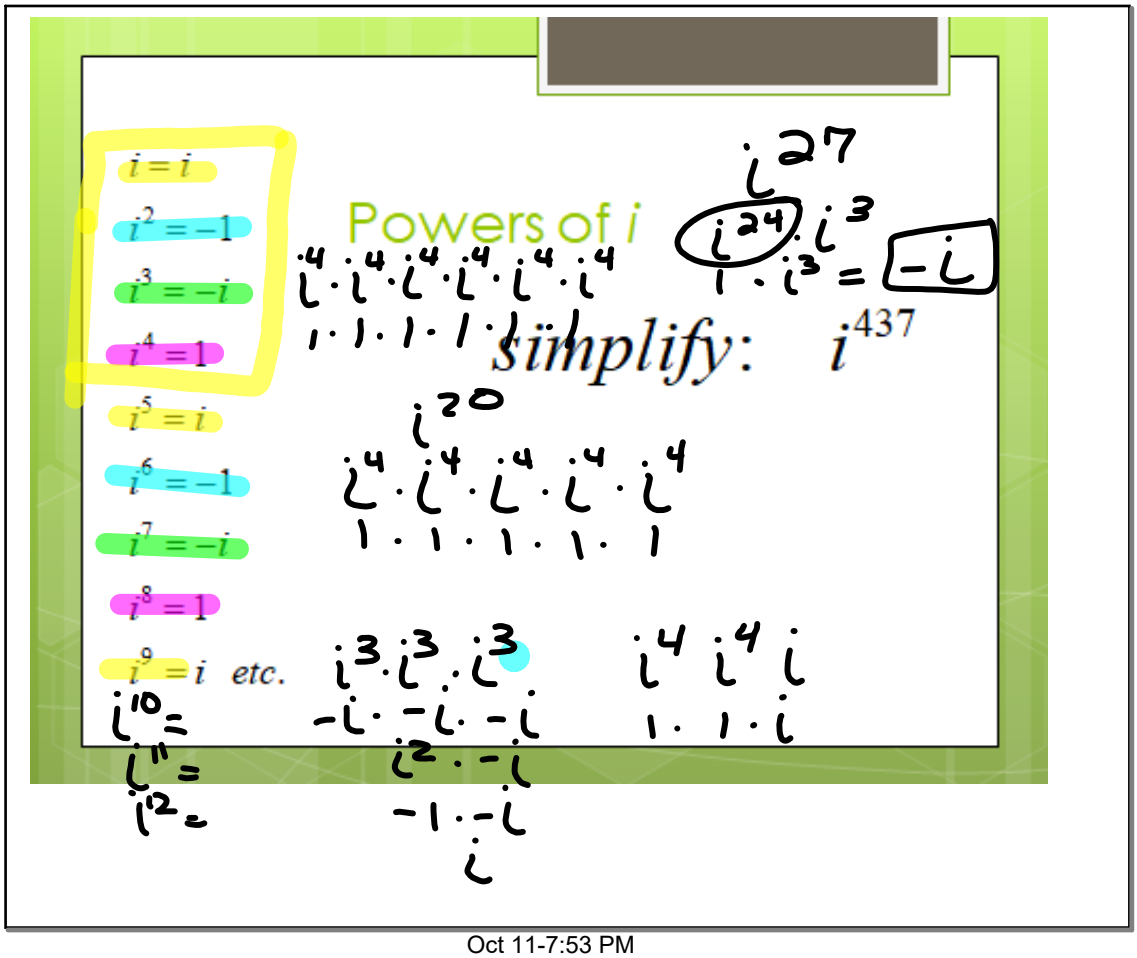

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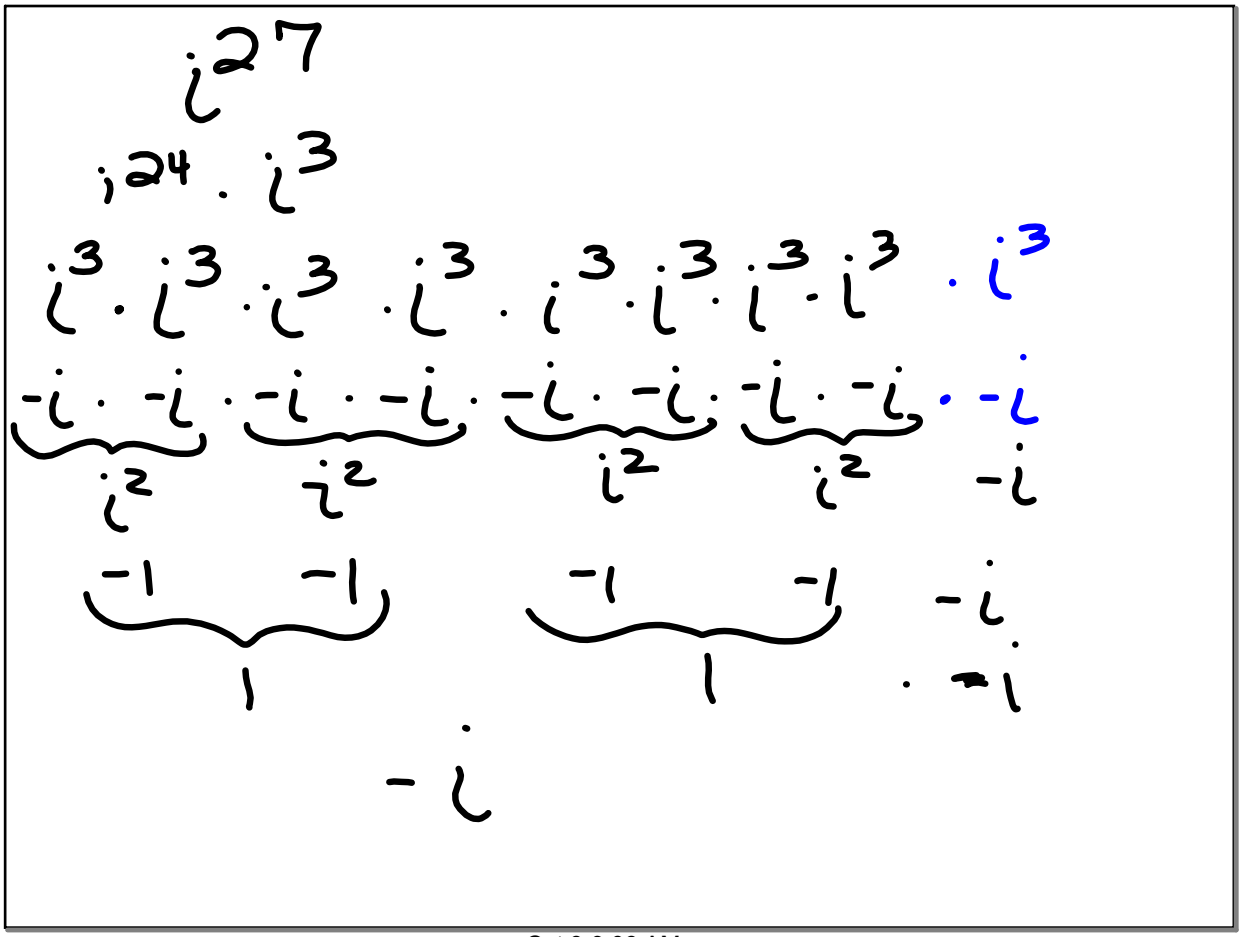

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i^{33}

$i^{32} \cdot i$

$1 \cdot i$

i

i^{66}

$i^{64} \cdot i^2$

$1 \cdot -1$

-1

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Operations with Complex #s

- Treat *i* like a variable
- Same rules as radicals will apply (bc *i* does represent a radical)
- Don't leave anything above a power of 1 for *i*

$2i - 10i = -8i$

$(3-4i) - (5+7i) = -2+3i$

$7-i$

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Multiply and Divide Complex

- Remove the *i* first before you multiply

$ex. \left(\sqrt{-4}\right) \bullet \sqrt{-8} \neq \sqrt{32}$

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

$ex. \quad -2i \cdot 6i =$

$ex. \quad (2+3i)(4-i) =$

$ex. \quad (5+5i)^2 =$

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