Stick Quiz

1 Write a quadratic equation with the roots –1 and $\frac{3}{4}$ in the standard form.

$4x^2 + x - 3 = 0$

2 Solve $3s^2 - 11s - 4 = 0$ by factoring.

$-\frac{1}{3}, 4$

3 Solve $2x^2 + 5x + 3 = 0$ by factoring.

$-\frac{3}{2}, -1$

$X = -1$ $\quad 4X = \frac{3}{4} \cdot 4$

$+1 \quad +1$ $\quad -3 \quad 4 \cdot 3$

$(X+1) = 0$ $\quad (4X-3) = 0$

$(X+1)(4X-3) = 0$

Solve $3s^2 - 11s - 4 = 0$ by factoring.

$3x^2 - 11x - 4 = 0$

$(3x^2 - 12x) + (1x - 4) = 0$

$3x(x - 4) + 1(x - 4) = 0$

$(x - 4)(3x + 1) = 0$

$x - 4 = 0 \quad 3x + 1 = 0$

$-1 \quad -1$

$\frac{3x}{3} = \frac{-1}{3}$

-12	-11
$1 \cdot 12$	$1x + -12x$
$2 \cdot 6$	
$3 \cdot 4$	

$x = 4, -\frac{1}{3}$

Questions On Homework

Part 1

I can... perform algebraic operations to complex numbers.

Solve for x.

$x^2 + 64 = 0$

$-64 \quad -64$

$\sqrt{x^2} = \sqrt{-64}$

$x = \pm\sqrt{-64}$

64	0
8·8	16
-8 -8	-16

Problem! We can't find the square root of a negative number!

Oh wait... We can!!!

Introducing: Imaginary Numbers!

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

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

$$i^3 = \left(\sqrt{-1}\right)^3 = \left(\sqrt{-1}\right)\left(\sqrt{-1}\right)\left(\sqrt{-1}\right) = -1 \bullet i = -i$$

$$i^4 = \left(\sqrt{-1}\right)^4 = \left(\sqrt{-1}\right)^2\left(\sqrt{-1}\right)^2 = -1 \bullet -1 = 1$$

$\sqrt{-1}$ i

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

$$i^2 = -1$$

$$i^3 = -i$$

$$i^4 = 1$$

So... What is $\sqrt{-4}$?

$$\sqrt{-4}$$

$$= \sqrt{-1 \bullet 4}$$

$$= \sqrt{-1} \bullet \sqrt{4}$$

$$= 2i$$

$\sqrt{10} = \sqrt{2 \cdot 5} = \sqrt{2} \cdot \sqrt{5}$

$\sqrt{6} \cdot \sqrt{3} = \sqrt{18} =$

$\sqrt{100} = 10$ $\sqrt{-100} = 10i$

$\sqrt{49}$ $\sqrt{-49}$

$\sqrt{36}$ $\sqrt{-36}$

$\sqrt{25}$ $\sqrt{-25}$

$\sqrt{-5} = \sqrt{-1 \cdot 5}$ $\sqrt{-1}\sqrt{5} = i\sqrt{5}$

$i\sqrt{5}$

$\sqrt{-7}$

$\sqrt{-13}$

$\sqrt{-15}$

Back to our problem...

$x^2 + 64 = 0$

$x = -8i$

$x = \pm\sqrt{-64}$ $x = 8i$

$x = \pm i\sqrt{64}$

Simplifying Radicals

Perfect Squares!

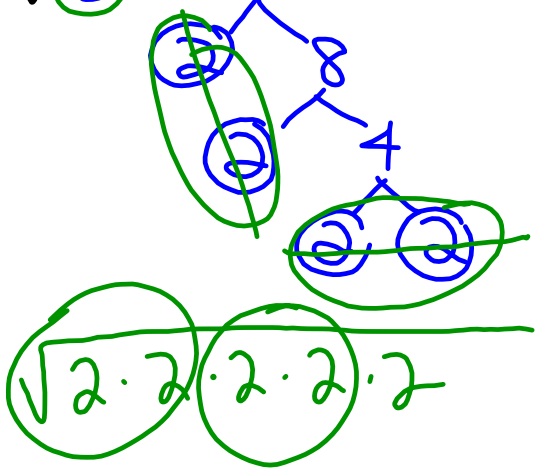
1. $\sqrt{144} =$ 12 2. $\sqrt{100} =$ 10

Find a Biggest Perfect Square that divides into the number under the radical.

3. $\sqrt{32} =$ _____ 4. $\sqrt{18} =$ _____

$\sqrt{32} = 2 \cdot 2\sqrt{2} = 4\sqrt{2}$

$\sqrt{2 \cdot 16} = \sqrt{2}\sqrt{16} = 4\sqrt{2}$



$\sqrt{18}$

First take out i

Second Squish together

Simplify

6. Simplify

$\sqrt{-2} \bullet \sqrt{-6}$

$i\sqrt{2} \cdot i\sqrt{6}$

$i^2\sqrt{12} = 2(i^2)\sqrt{3} = -2\sqrt{3}$

$\sqrt{12}$

$\sqrt{3 \cdot 4}$

$2\sqrt{3}$

$\sqrt{-3} \bullet \sqrt{-6}$

$\sqrt{-3} \cdot \sqrt{-6}$

$i\sqrt{3} \cdot i\sqrt{6}$

$i^2\sqrt{18} = i^2\sqrt{2}\sqrt{9} = (i^2) 3\sqrt{2}$

$-3\sqrt{2}$

2 9

3 3

$\sqrt{100}$

$\sqrt{-100}$

$\sqrt{49}$

$\sqrt{-49}$

$\sqrt{121}$

$\sqrt{-36}$

$\sqrt{-5}$

$\sqrt{-10}$

You Try! White Boards

7. **Simplify** $\sqrt{-50}$.

$5i\sqrt{2}$

8. **Simplify** $\sqrt{-45}$.

$3i\sqrt{5}$

9. Simplify $\sqrt{-6} \bullet \sqrt{-8}$

Solve

9. $4x^2 + 4 = 0$

10. $2x^2 + 10 = 0$

You Try! On the White Boards!!!!

Solve.

11. $2x^2 + 50 = 0$

12. $6x^2 + 108 = 0$

$-108 \quad -108$

$\frac{6x^2}{6} = \frac{-108}{6}$

$\sqrt{x^2} = \sqrt{-18}$

$x = \pm\sqrt{-18}$

White Boards!!!!

Simplify:

4x + 2x

3x - 5x

4i + 2i

3i - 5i

Complex Number

$$a + bi$$

** Add reals *** Add Imaginary**

Adding Complex Numbers:

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

(-3 + 6i) + (7 - 4i)

Subtracting Complex Numbers:

(2 - 4i) - (3 + 5i)

$2 - 4i - 3 - 5i \qquad -1 - 9i$

(-3 + 6i) - (7 - 4i)

You Try! Simplify the expression.

White Boards!!!

13. $(3 + 5i) + (2 - 4i)$

15. $(4 - 6i) - (3 - 7i)$

Multiplying/Dividing Complex Numbers

Next class!

Homework 4.4

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#18-23, 26-29, 36-41,48,

49,51,52,66

Different than your Stamp Sheet!