

Welcome to Coach Curlette's Class

Needs: Notebook
Paper in Notebook
Pen or Pencil ... I don't care!
** To Think Everyday!!!!

Expectations: Respect
To Think
To Do Your BEST!!

“All our dreams can come true – if we have the courage to pursue them.”
- *Walt Disney*

Discuss what you learned in your previous class with someone sitting near you. You have two minutes.



imaginary numbers
radicals (square root) $\sqrt{\quad}$
 $\sqrt{-1} = ?$
 $i = \sqrt{-1}$
 $i^2 =$

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

$$i^2 = ? \quad \underline{\text{why?}}$$

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

$$i^2 = i \cdot i$$

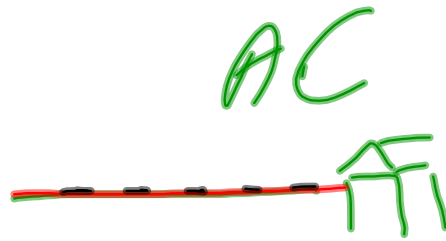
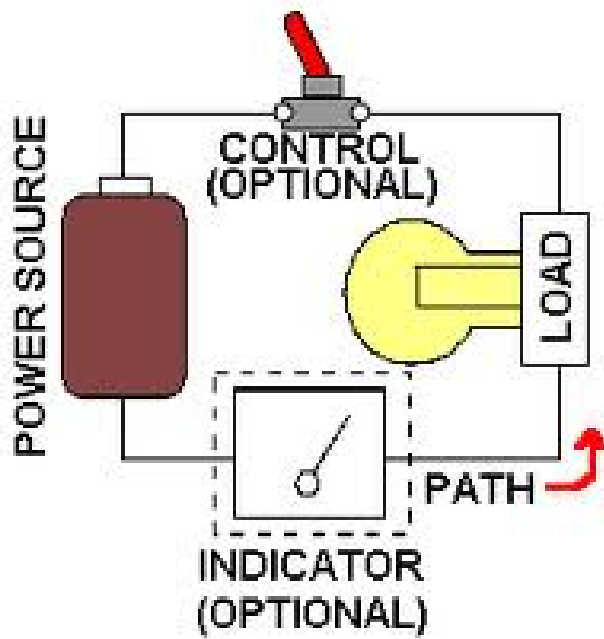
$$\sqrt{-1} \cdot \sqrt{-1} = (\sqrt{-1})^2 = -1$$

$i = \sqrt{-1}$
 $i^2 = -1$
 $i^3 = \boxed{i \cdot i \cdot i} = -i \text{ or } -\sqrt{-1}$
 $i^4 = \boxed{i \cdot i \cdot i \cdot i} = +1$
 $i^5 = \underline{i \cdot i \cdot i \cdot i \cdot i} = i$
 $i^6 = \underline{i \cdot i \cdot i \cdot i \cdot i \cdot i} = -1$

Even Power
 = -1 or +1
 Odd Power
 = i or -i

Complex Numbers ... Why?

SIMPLE CIRCUIT



Warm-up:

This concept will link your previous knowledge to today's lesson.



Simplify:

$$2x + 5y - 6x + y$$

2

$$(3x + y) + (5x - 4y)$$

3

$$(7x - 3y) - (x + 9y)$$



4

$$(2x + y)(3x + 5y)$$

$$\sqrt{24}$$

$$\sqrt{4 \cdot 6}$$

$$\sqrt{4} \cdot \sqrt{6}$$

$$2\sqrt{6}$$

$$\sqrt{\cancel{4} \cdot 24}$$

$$i \sqrt{24}$$

$$i \sqrt{4 \cdot 6}$$

$$i \sqrt{4} \cdot \sqrt{6}$$

$$2i \sqrt{6}$$

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

$$2i$$

- 1
- 4
- 9
- 16
- 25
- 36
- 49
- 64
- 81
- 100

$$3\sqrt{50}$$

$$3 \cdot i \cdot \sqrt{50}$$
$$\sqrt{25 \cdot 2}$$
$$\sqrt{25} \cdot \sqrt{2}$$
$$\underline{3} \cdot i \cdot \underline{5} \sqrt{2}$$
$$15i\sqrt{2}$$

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$(x_1 - x_2) \quad (y_1 - y_2)$$

$$a^2 + b^2 = c^2$$

$(7, 2) \quad (5, 1)$

$$\begin{array}{r} (7, 2) \\ - (5, 1) \\ \hline \end{array}$$

$\sqrt{2^2 + 1^2}$

$y/x = 1/2$

$4 + 1 = \sqrt{5}$

What does it mean to "combine like terms"?

$$\begin{array}{l} 7x + 5y + 6x + 4 \\ 13x + 5y + 4 \end{array}$$

$$\begin{array}{r} \boxed{7x} + 5y = \boxed{6x} + 4y \\ \hline -6x \qquad \qquad -6x \\ \hline x + 5y = 4y \\ \qquad -4y \qquad \qquad -4y \\ \hline x - y = 0 \end{array}$$

What are ways that you can "multiply"?

What does it mean to "**divide**"?

What does it mean to "**divide by the conjugate**"?

What is "*i*" ?

- Simplify i^{17} .
- Simplify i^{120} .
- Simplify $i^{64,002}$.

- Simplify $2i + 3i$.

- Simplify $16i - 5i$.

- Multiply and simplify $(3i)(4i)$.

- Multiply and simplify $(i)(2i)(-3i)$.

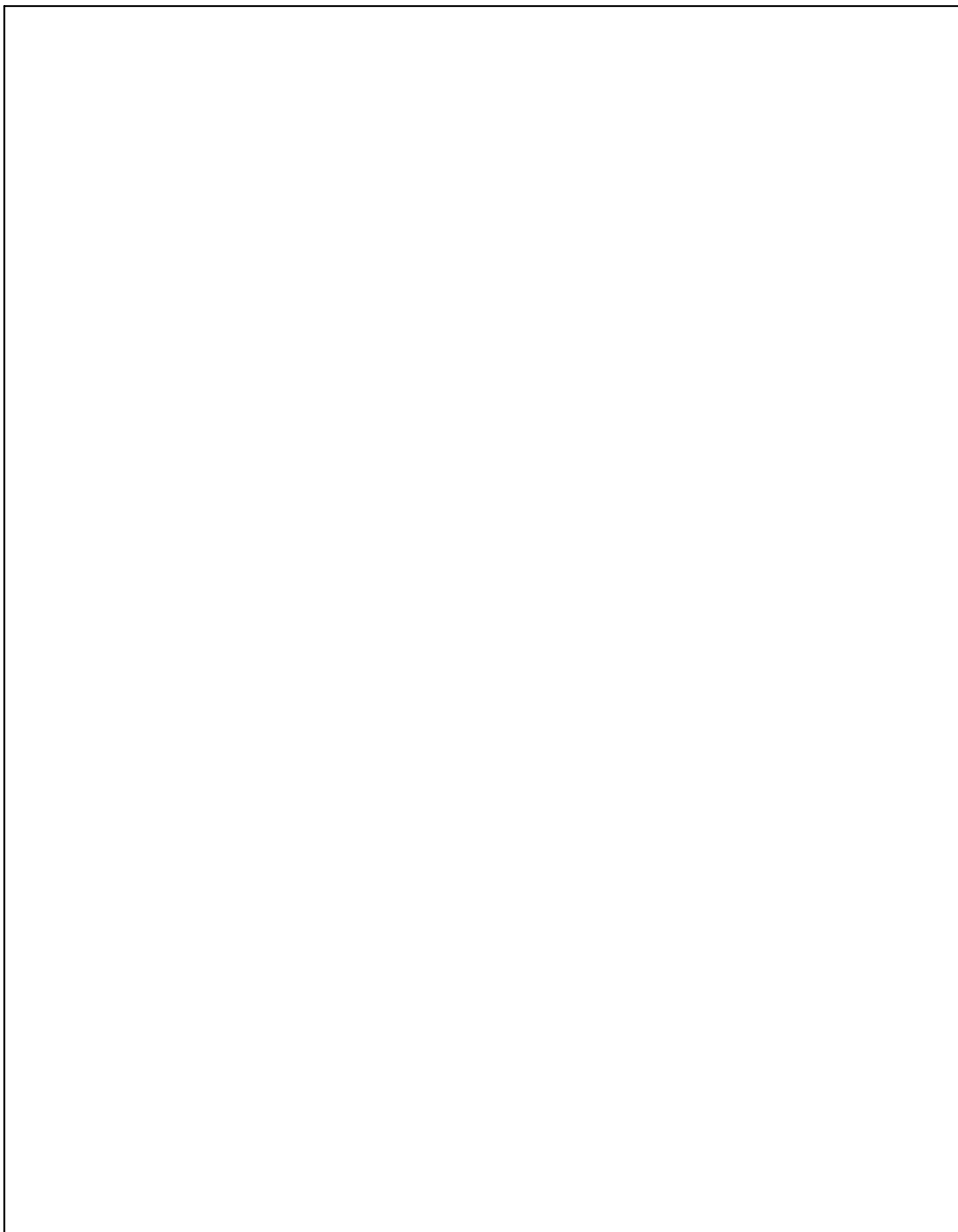
complex numbers - written in the form $a+bi$, where a is the real number and bi is the imaginary number

Adding complex numbers (just like combining like terms)

****add the real parts, add the imaginary parts****

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

$$(-5 + 8i) + (-4 - 10i)$$



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

$$(-5 + 8i)(-4 - 10i)$$

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

$$(-5 + 8i) - (-4 - 10i)$$

$$\frac{-5 + 8i}{-4 - 10i}$$

$$\frac{3 - 7i}{5i}$$

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

$$12 + 15i - 28i - 35i^2$$

$$12 - 13i - 35i^2$$

$$12 - 13i - 35(-1)$$

$$12 - 13i + 35$$

$$47 - 13i$$

$$* i^2 = -1$$

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

$$(-5 + 8i)(-4 - 10i)$$

$$20 + 50i - 32i - 80i^2$$

$$20 + 18i - 80i^2$$

$$\underline{20} + 18i + \underline{80}$$

$$100 + 18i$$

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

$$(-5 + 8i) - (-4 - 10i)$$

$$(-5 + 8i) - (-4 - 10i)$$

$$\begin{aligned} & -5 + 8i + 4 + 10i \\ & -1 + 18i \end{aligned}$$

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

$$\boxed{3} - 7i - \boxed{4} - 5i$$

$$-1 - 12i$$

$$\frac{-5 + 8i}{-4 - 10i}$$

$$* (x+2)(x-2)$$

$$x^2 - 4$$

$$\frac{(-5 + 8i)(-4 + 10i)}{(-4 - 10i)(-4 + 10i)} = 116$$

$$-4(-4) - 10i(10i)$$

$$16 - 100i^2$$

$$16 + 100$$

$$116$$

$$\frac{(-5 + 8i)(-4 + 10i)}{(-4 - 10i)(-4 + 10i)} = 116$$

#8 $3 + 15i$

$$\frac{(-4 - 10i)}{(-4 + 10i)} \cdot \frac{(-4 + 10i)}{(-4 + 10i)}$$

$$(x+2)(x-2) = x^2 - 4$$

$$-2x + 2x = 0$$

$$(x+3)(x-3) = x^2 - 9$$

$$-3x + 3x = 0$$

$$(x-i)(x+i)$$

$$x^2 + xi - xi - i^2$$

$$x^2 - i^2$$

$$x^2 - (-1) = x^2 + 1$$

$$(2x+3i)(2x-3i)$$

$$4x^2 - 9i^2$$

$$4x^2 - 9(-1)$$

$$4x^2 + 9$$

$$(-2x+5i)(-2x-5i)$$

$$4x^2 - 25i^2$$

$$4x^2 + 25$$

$$\frac{3-7i}{5i}$$

