Bellwork:

solve: $4(x-1)^2 = 8$

$\frac{4(x-1)^2}{4} = \frac{8}{4}$

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

$x - 1 = \pm\sqrt{2}$

$x = 1 \pm \sqrt{2}$

Chapter 4.6: Perform Operations with Complex Numbers

What is the solution to $x^2=-1$?

- Not all answers are Real Numbers...
We call these Imaginary numbers, i.

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

$$i^2 = -1$$

$$i^3 = -i$$

$$i^4 = 1$$

ex. Solve: $2x^2 + 11 = -37$

$-11 \quad -11$

$\frac{2x^2}{2} = \frac{-48}{2}$

$\sqrt{x^2} = \sqrt{-24}$

$x = \pm\sqrt{+24}\, i$

$2 \mid 12$

$2 \mid 6$

$2 \mid 3$

$x = \pm 2\sqrt{6}\, i$

Complex Number System(a+bi)

Real Numbers
(a+0i)

Imaginary Numbers
(0+bi)

3

2i

3 + 4i

Properties:

$$(a+bi)+(c+di)=(a+c)+(b+d)i$$

$$(a+bi)-(c+di)=(a-c)+(b-d)i$$

*Hint... Just add like terms

ex. Simplify:

a. (8-i)+(5+4i)

8 - i + 5 + 4i

13 + 3i

b. (7-6i)-(3-6i)

7 - 6i - 3 + 6i

4 + 0i

c. 10-(6+7i)+4i

10 - 6 - 7i + 4i

4 - 3i

ex. Write the expression as a complex number in standard form.

$a+bi$

$4i(-6+1)$

$-24i+4i$

$-20i$

$0-20i$

$(9-2i)(-4+7i)$

$-36+63i+8i-14i^2$

(-1)

$-36+71i+14$

$-22+71i$

Complex Conjugates....

remember... $5+\sqrt{2} \longleftrightarrow 5-\sqrt{2}$

so... $3+5i \longleftrightarrow 3-5i$

ex. Write in standard form.

$$\frac{(7+5i)(1+4i)}{(1-4i)(1+4i)} = \frac{7+28i+5i+20i^2}{1+16i^2}$$

$$\frac{-13+33i}{17}$$

$$-\frac{13}{17}+\frac{33}{17}i$$

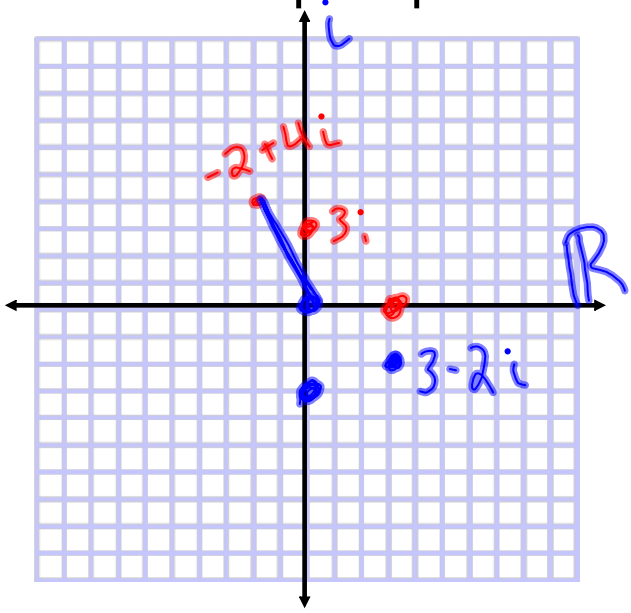
ex. Plot the numbers on the complex plane.

a. 3-2i

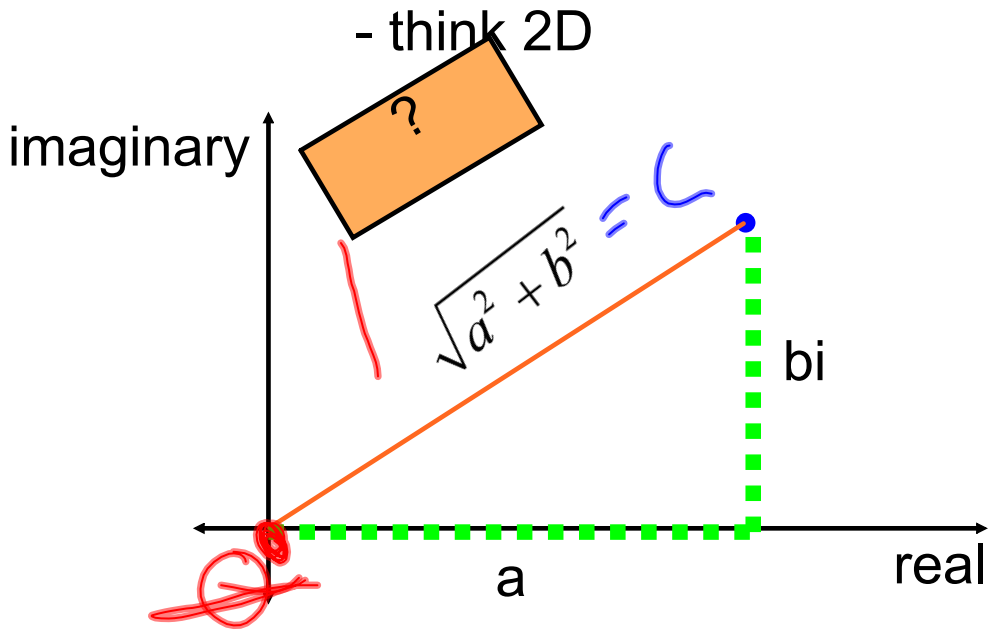
b. -2+4i

c. 3i → 0+3i

d. ~~-4-3i~~ 3



What is the absolute value?



ex. Find the absolute value of:

a. $|-4+3i|$

$\sqrt{(-4)^2+(3)^2}$

$\sqrt{16+9}$

$\sqrt{25}$ +5

b. -3i $0-3i$

$\sqrt{0^2+(-3)^2}$

$\sqrt{0+9}$

$\sqrt{9}$ = +3

Homework: Chapter 4.6 pg.279
#'s 4-32e, 42,44,50,54,56,68