Warm Up

#1 $\sqrt{-81}$

$\sqrt{81} \cdot \sqrt{-1}$

$9i$

$\sqrt{-20}$

$\sqrt{20} \cdot \sqrt{-1}$

$2i\sqrt{5}$

#2 $(3+2i)-(2-4i)$

$3+2i-2+4i$

$1+6i$

$(1+3i)(1-3i)$

$1-9i^2$

$1+9$

10

i^6

$(i^2)(i^2)(i^2)$

$(-1)(-1)(-1)$

-1

Questions from Homework?

① a) $(3-i)+(2x+yi)=-2i+6i$

$3-i+2x+yi=0+4i$

$3+2x=0$

$\frac{2x}{2}=\frac{-3}{2}$

$x=\frac{-3}{2}$

$-i+yi=4i$

$\frac{yi}{i}=\frac{5i}{i}$

$y=5$

b) $3x-2yi=2i+(1+6i)$

$3x-2yi=2i+1+6i$

$3x-2yi=1+8i$

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

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

$\frac{-2yi}{-2i}=\frac{8i}{-2i}$

$y=-4$

4e) $\frac{(2+i\sqrt{5})(1+3i)}{(1-3i)(1+3i)}$

$\frac{2+6i+i\sqrt{5}+3i^2\sqrt{5}}{1-9i^2}$

$\frac{2+6i+i\sqrt{5}-3\sqrt{5}}{10}$

$\frac{2-3\sqrt{5}+6i+i\sqrt{5}}{10}$

$\frac{2-3\sqrt{5}+i(6+\sqrt{5})}{10}$

☆ Recall from yesterday:☆

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

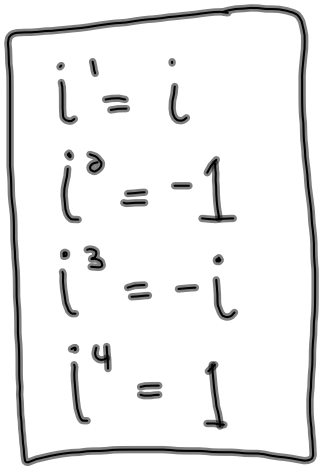
$$i^2 = -1$$

$$i^3 = i^2 \bullet i = (-1)i = -i$$

$$i^4 = i^2 \bullet i^2 = (-1)(-1) = 1$$

$$i^5 = i^4 \bullet i = (1)i = i$$

$$i^6 = i^4 \bullet i^2 = (1)i^2 = -1$$



You may notice that anytime the exponent is a multiple of 4, the power is 1, so $i^{76} = 1$. Remember that a number is divisble by 4 if the last two digits are divisible by 4.
When the exponent is not a multiple of 4 you can break it down so that part of it is

$$i^{328} = 1$$ **(because 328 is a multiple of 4)**

$$i^{39} = i^{36} \bullet i^3 = (1)(-i) = -i$$

$$i^{82} = i^{80} \bullet i^2 = (1)(-1) = -1$$

Homework