

Guided Practice Part I: Complete all problems and show ALL work. Box answers.

1. $\sqrt{-16} = \boxed{4i}$

4. ~~$\sqrt{-10} \cdot \sqrt{-2}$~~

2. $\sqrt{-28}$
 $\sqrt{-1} \cdot \sqrt{28}$
 $i\sqrt{28}$



5. ~~$\frac{\sqrt{-50}}{\sqrt{-10}}$~~

3. $\sqrt{-5}$
 $\sqrt{-1} \sqrt{5}$
 $i\sqrt{5}$

6. ~~$\frac{21\sqrt{-6}}{7\sqrt{2}}$~~

Adding and Subtracting:

Complex numbers can be added, subtracted, multiplied, and divided like all other numbers. Use the following steps when you add and subtract:

1. Treat the i like an x
2. Combine like terms.

Ex.

1. $3i + 4i = 7i$

2. $9i - 5i = 4i$

3. $(2 - 6i) + (4 + i) = 6 - 5i$

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

write your final answer in the form $a + bi$

Guided Practice Part II: Complete all problems.

1. $(-4 + 2i) + (6 - 3i)$
 $\boxed{2 - i}$

2. $(5 - i) - (3 - 2i)$
 $5 - i - 3 + 2i$
 $\boxed{2 + i}$

3. $(6 - 3i) + (4 - 2i)$
 $\boxed{10 - 5i}$

4. $(-11 + 4i) - (1 - 5i)$
 $-11 + 4i - 1 + 5i$
 $\boxed{-12 + 9i}$

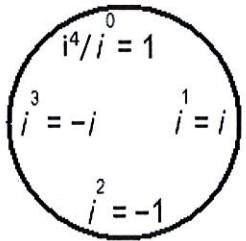
5. $(8 + 4i) + (8 - 4i)$
 $\boxed{16}$

6. $(5 + 2i) - (-6 - 3i)$
 $5 + 2i + 6 + 3i$
 $\boxed{11 + 5i}$

1.5A Powers of i Supplement

Before moving on to multiplication and division of imaginary/complex numbers, it is important to stress the Cycle of Powers of i also known as the **The Rule of Four.**

There are only four results from taking any positive power of i, and they are i, -1, -i and 1. Check out the different strategies below to help you remember because you will need to memorize this!!

I Won(once), I Won(once) <i>(Negatives in the Middle)</i>	The Cycle of i	The Decimal Quarters <i>(with calculator)</i>	The Remainder <i>(without calculator)</i>
$i^1 = i$ $i^2 = -1$ $i^3 = -i$ $i^4 = 1$		Divide the exponent by 4 and if it ends in... .25 = 1 quarter = $i^1 = i$.50 = 2 quarters = $i^2 = -1$.75 = 3 quarters = $i^3 = -i$.0 = 4 quarters = $i^4 = 1$	Divide the exponent by 4 and if the remainder is... 1 answer is i 2 answer is -1 3 answer is -i 0 answer is 1

Example(s):

$i^{27} =$

$$\begin{array}{r} 6 \\ 4 \overline{) 27} \\ \underline{-24} \\ 3 \end{array}$$

$i^3 = \boxed{-i}$ (3)R

$i^{44} =$

$i^0 = \boxed{1}$

$i^{44} =$

$$\begin{array}{r} 11 \\ 4 \overline{) 44} \\ \underline{-44} \\ 0 \end{array}$$

$i^0 = \boxed{1}$ (0)R

$i^{17} = \boxed{i}$

$i^{34} = \boxed{-1}$