$\sqrt{12}$
$\sqrt{2\cdot 2\cdot 3}$
$2\sqrt{3}$

12
3 4
2 2

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

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

2. $\sqrt{-28}$ $\sqrt{-1}\cdot\sqrt{28}$ $i\sqrt{28}$ $\boxed{2i\sqrt{7}}$

28
4 7
2 2

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

4. $\cancel{\sqrt{-10}\bullet\sqrt{-2}}$

5. $\cancel{\dfrac{\sqrt{-50}}{\sqrt{-10}}}$

6. $\cancel{\dfrac{21\sqrt{-6}}{7\sqrt{2}}}$

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

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

Name: ____ Date: _____________ Period: ________

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(one), I Won(one) *(Negatives in the Middle)*	**The Cycle of i**	**The Decimal Quarters** *(with calculator)*	**The Remainder** *(without calculator)*
$i^1 = i$ $i^2 = -1$ $i^3 = -i$ $i^4 = 1$	$i^4 / i^0 = 1$ $i^3 = -i$ $i^1 = i$ $i^2 = -1$	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):

$i^{27} = i^3 = \boxed{-i}$ $\quad 27 \div 4 = 6$, $27 - 24 = 3$ R

$i^{44} = i^0 = \boxed{1}$ $\quad 44 \div 4 = 11$, $44 - 44 = 0$ R

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

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