COMPEX NUMBERS

Agenda:

Objective: Add, subtract, multiply and simplify complex numbers

(1 presentations for Extra Credit?)

1) Take out HW to be Checked
2) DO NOW- (Groups of 4)
3) Explanation:
   - Adding, Subtracting, Multiplying, & Simplifying Complex Numbers
4) Practice Problems (Groups)
5) Exit Ticket

HW: "HW Worksheet #2"

DO NOW

Directions:
Push desks into groups of four. Simplify the 4 problems below.

(1) a) i^5	b) i^7	c) $(i^5) \cdot (i^7)$	d) $(i^5) + (i^7)$
(2) a) i^8	b) i^{10}	c) $(i^8) \cdot (i^{10})$	d) $(i^8) + (i^{10})$
(3) a) i^6	b) i^{13}	c) $(i^6) \cdot (i^{13})$	d) $(i^6) + (i^{13})$
(4) a) i^{12}	b) i^{21}	c) $(i^{12}) \cdot (i^{21})$	d) $(i^{12}) + (i^{21})$

Multiplying Powers of *i*

Follow exponent rules, but the final result needs to be fully simplified.
(That is, **your final answer simplifies powers of i into 1, -1, *i* or -*i***)

Example:

$2i \bullet 5i$ $= 2 \cdot 5 \cdot i \cdot i$ $= 10i^2$ $= 10 \cdot -1$ $= -10$	$(2i + 3)(i - 4)$ F O I L $= 2i^2 - 8i + 3i - 12$ $= 2(-1) - 5i - 12$ $= -2 - 5i - 12$ $= -5i - 14$

Adding and Subtracting with Complex Numbers

Complex numbers and imaginary units follow the rules of algebra.

Example:

$8 - 5i - (2 - 3i)$
$= 8 - 5i - 2 + 3i$
$= 8 - 2 - 5i + 3i$
$= 6 - 2i$

1. Simplify these examples and if you miss any problems, take notes and make corrections.

a. $\sqrt{-12} \bullet \sqrt{-3} =$	b. $2i(3 - 5i) =$
c. $-5 + 2i - 3 + 5i =$	d. $6 - (2 + 4i) =$
e. $(3 + 2i)(3 - 2i) =$	f. $i^2 - 4i^7$

Practice Problems:

Directions:
Simplify the following problems. Circle your final answer. Check answers with group. (Write final answers of powers of i in appropriate form.)

1. $2i + 5i$ =	2. $2i \bullet 5i$ =	3. $2i \bullet 13$ =
4. $2i(3 - i)$ =	5. $(5 + 4i)(5 - 4i)$ =	6. $(5 + 4i)(2 - i)$ =
7. $3 - 4i - (2 - 5i)$ =	8. $6 - i + 4 - 5i - 7 + 3i$	9. $(5 + \sqrt{-2})(5 - \sqrt{-2})$ =
10. $-10 + 2i - (3 - 4i)$ =	11. $i^8 + i^{10}$	12. $i^{12} + i^6$

Name_____

Score:_____/11

Block_____

Exit Ticket

Simplify the following. Use the simplest power of i.
Show all work to receive partial credit.

1) $4 - 7i - (2 - 6i) =$	2) $(2i - 5)(i + 3) =$

Name_____

Score:_____/11

Block_____

Exit Ticket

Simplify the following. Use the simplest power of i.
Show all work to receive partial credit.

1) $5 - 6i - (3 - 9i) =$	2) $(3i - 5)(i + 2) =$

Name_____

Score:_____/11

Block_____

Exit Ticket

Simplify the following. Use the simplest power of i.
Show all work to receive partial credit.

1) $4 - 7i - (2 - 6i) =$	2) $(2i - 5)(i + 3) =$
$= 4 - 7i - 2 + 6i$ $= 2 - i$ (4 pts)	$= 2i^2 + 6i - 5i - 15$ $= -2 + i - 15$ $= i - 17$ (7 pts)

Name_____

Score:_____/11

Exit Ticket

Block_____

Simplify the following. Use the simplest power of i.
Show all work to receive partial credit.

1) $5 - 6i - (3 - 9i) =$	2) $(3i - 5)(i + 2) =$
$= 6 - 6i - 3 + 9i$ $= 3 + 3i$ (4 pts)	$= 3i^2 + 6i - 5i - 10$ $= -3 + i - 10$ $= i - 13$ (7 pts)

HW Worksheet #2 Name_____

Simplifications of expressions Block_____

Simplify the following problems. (Write final answers of powers of i in appropriate form.) Circle your final answer.

1. $\sqrt{-400}$ =	2. $\sqrt{48}$ =	3. $5 \bullet \sqrt{20}$ =
4. $i^3 \cdot i^4$ =	5. $(3i - 2)^2$ =	6. $-3i(4 - 5i)$ =
7. $2i - 14i$ =	8. $-2i \bullet 2i$ =	9. $(5 + i)(5 - i)$ =
10. $(2 + 3i)(4 - i)$ =	11. $4 - (2i - 7)$ =	12. $-4(2i - 7)$ =
13. i^{39} =	14. i^{22} =	15. i^{44} =
16. $3 + 4i - (-2 - 3i)$ =	17. $6 - i + 4 - 5i - 7 + 3i$ =	18. $6i^2 - i^4 + 4 - 5i - 7 + 3i^3$ =

HW Worksheet #2 Name_____

Simplifications of expressions Block_____

Simplify the following problems. (Write final answers of powers of i in appropriate form.)
Circle your final answer.

1. $\sqrt{-400}$ = $20i$	2. $\sqrt{48}$ = $16 \cdot 3 = \boxed{4\sqrt{3}}$	3. $5 \bullet \sqrt{20}$ = $5 \cdot 2\sqrt{5}$ $= \boxed{10\sqrt{5}}$
4. $i^3 \cdot i^4$ = $= -i \cdot 1$ $= \boxed{-i}$	5. $(3i - 2)^2$ = $(3i-2)(3i-2)$ $-9i^2 - 12i + 4$ $= \boxed{-5 - 12i}$	6. $-3i(4 - 5i)$ = $-12i + 15i^2$ $= \boxed{-15 - 12i}$
7. $2i - 14i$ = $-12i$	8. $-2i \bullet 2i$ = $-4i^2 = \boxed{4}$	9. $(5 + i)(5 - i)$ = $25 - i^2$ $= \boxed{26}$
10. $(2 + 3i)(4 - i)$ = $8 - 2i + 12i - 3i^2$ $\boxed{11 + 10i}$	11. $4 - (2i - 7)$ = $4 - 2i + 7$ $\boxed{11 - 2i}$	12. $-4(2i - 7)$ = $-8i + 28$
13. i^{39} = $= i^3 = \boxed{-i}$	14. i^{22} = $= i^2 = \boxed{-1}$	15. i^{44} = $= i^0 = \boxed{1}$
16. $3 + 4i - (-2 - 3i)$ = $3 + 4i + 2 + 3i$ $\boxed{5 + 7i}$	17. $6 - i + 4 - 5i - 7 + 3i$ = $3 - 3i$	18. $6i^2 - i^4 + 4 - 5i - 7 + 3i^3$ = $-6 - 1 + 4 - 5i - 7 - 3i$ $\boxed{-10 - 8i}$