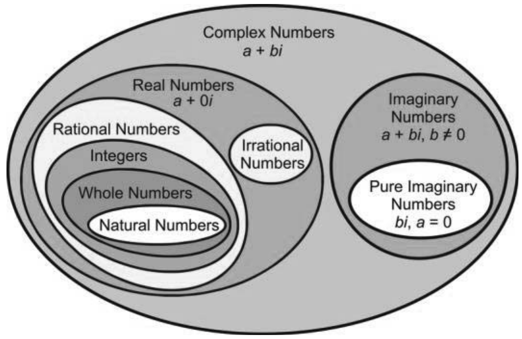
Name ______________________________________ Introduction to imaginary numbers

$i^2 = -1$



A complex number is of the form a + bi, where a is the real number and bi is the imaginary number.

Simplify negative square roots:

- Rewrite $\sqrt{-a}$ as $\sqrt{a \cdot -1}$
- Break down the perfect square if necessary, and simplify

1. $\sqrt{-9}$	2. $\sqrt{-196}$	3. $\sqrt{-5}$
4. $\sqrt{-80}$	5. $\sqrt{-32}$	6. $-4\sqrt{-20}$

Add or subtract. Write your final answer in the form a + bi.

7. (4 + 7i) + (2 – 3i)	8. (5 – 2i) – (7 – 6i)	9. (3 + i) + (-4 – 2i)

10. $(9 + \sqrt{-36}) + (-2 + \sqrt{-4})$	11. $(8 - \sqrt{-100}) - (2 + \sqrt{-9})$	12. $(2 + \sqrt{-12}) + (5 - \sqrt{-27})$

How can we compute higher powers of I without extending the table?

i^1	i^5
i^2	i^6
i^3	i^7
i^4	i^8

13. I^{20}	14. I^{37}	15. I^{203}	16. I^{62}

Use properties of exponents and the above table to multiply

17. 5i(9i)	18. -8i(4i)	19. 3i(2i)(5i)
20. (3 + 2i)(5 + 3i)	21. (3 – i)(3 + i)	22. (2 – 5i)(5 – 2i)

Name ____ Intro to imaginary numbers

1. $\sqrt{-225}$	2. $\sqrt{-1}$	3. $\sqrt{-300}$	4. $\sqrt{-88}$
5. $\sqrt{-75}$	6. $\sqrt{-44}$	7. $\sqrt{-48}$	8. $-2\sqrt{-63}$
9. (1 + 5i) + (1 – 5i)	10. (3 + 2i) – (3 + 2i)	11. (2 + 6i) – (7 + 9i)	12. (3 + 3i) – (8 – 3i)
13. (5 + 4i) – (-1 – 2i)	14. (6 – 8i) + (4 – 5i)	15. (3 + i) + (3 + i)	16. (-1 – 7i) + (-4 – 3i)
17. $(2 + \sqrt{-1}) + (-3 + \sqrt{-16})$	18. $(4 + \sqrt{-25}) - (-5 - \sqrt{-25})$	19. $(4 + \sqrt{-9}) + (6 - \sqrt{-49)}$	20. $(8 + \sqrt{-1}) - (3 + \sqrt{-16})$

21. $(3 + \sqrt{-25}) + (12 + \sqrt{-121})$	22. $(2 + \sqrt{-16}) - (4 - \sqrt{-16})$	23. $(2 + \sqrt{-8}) + (3 + \sqrt{-18})$	24. $(-1 + \sqrt{-45}) + (-1 - \sqrt{-20})$
25. i^{29}	26. i^{47}	27. i^{78}	28. i^{44}
29. (3i)(3i)	30. $(4i)^2$	31. (-3i)(8i)	32. (2i)(4i)(6i)
33. 4(5i)	34. 4i(5i)	35. $(3i^2)(4i^2)$	36. -5i(5i)
37. (3 + 6i)(3 – 6i)	38. (3 + i)(9 – 3i)	39. (2 + 3i)(4 + 7i)	40. (2 – 5i)(3 – 6i)