**What is an imaginary number?**

A number "i" that, when squared, results in a \_\_\_\_\_\_\_\_\_\_\_\_\_.

Defined as i = \_\_\_.

If i = \_\_, then...

 = \_\_\_\_\_\_\_\_\_\_\_\_\_

 = \_\_\_\_\_\_\_\_\_\_\_\_\_

 = \_\_\_\_\_\_\_\_\_\_\_\_\_

 = \_\_\_\_\_\_\_\_\_\_\_\_\_

 = \_\_\_\_\_\_\_\_\_\_\_\_\_

What do you think happens with ?

What does this mean about imaginary numbers?

**How could you simplify imaginary numbers with any exponent?**

\*Take the exponent and divide by \_\_\_\_\_\_.

\*If your remainder is...

1 or \_\_\_ use \_\_\_\_\_\_\_\_

2 or \_\_\_ use \_\_\_\_\_\_\_\_

3 or \_\_\_ use \_\_\_\_\_\_\_\_

0 or \_\_\_ use \_\_\_\_\_\_\_\_

**Examples: Simplify completely.** 

**We can also use \_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_ with imaginary numbers!**

**Examples: Simplify completely.**

|  |  |  |
| --- | --- | --- |
| 5.)  | 6.)  | 7.)  |

We see the most benefit from imaginary numbers when simplifying radicals. Imaginary numbers allow us to simplify radicals with negatives under an **\_\_\_\_\_\_\_\_\_\_** index!

**Simplifying Radicals with Negatives:**

\*Take out the \_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_ the radical and write as an “\_\_\_\_\_” on the outside.

\*\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the radical like normal.

**Examples: Simplify completely.**

|  |  |
| --- | --- |
| 8.)  | 9.)  |

**What is a complex number?**

A combination of a \_\_\_\_\_\_\_\_\_ number and an \_\_\_\_\_\_\_\_\_\_\_\_\_ number.

**Operations with Imaginary & Complex Numbers:**

When adding, subtracting, and multiplying...treat these exactly how you would if the problem contained an "\_\_\_\_\_\_\_" instead of an "i."

\*DO \_\_\_\_\_\_\_ CHANGE THE EXPONENTS!

\*Just remember to \_\_\_\_\_\_\_\_\_ "i" completely!

|  |  |
| --- | --- |
| **Adding?**\*Combine like-terms. | **Subtracting?**\*Distribute the negative to all of the terms in the (\_\_).\*Combine like-terms. |

**Example: Simplify completely.**

|  |  |
| --- | --- |
| 10.) (6i + 2) + (9 – 3i) | 11.) (5 – 2i) – (–4 – i)  |
| 12.)  |

**Multiplying?**

\*Distribute & combine like-terms

*Remember your rules of exponents!*

**Example: Simplify completely.**

|  |  |
| --- | --- |
| 13.) 2i(5 + 3i) | 14.) (3 + 2i)(4 - 5i) |
| 15.) (3 - 2i) |