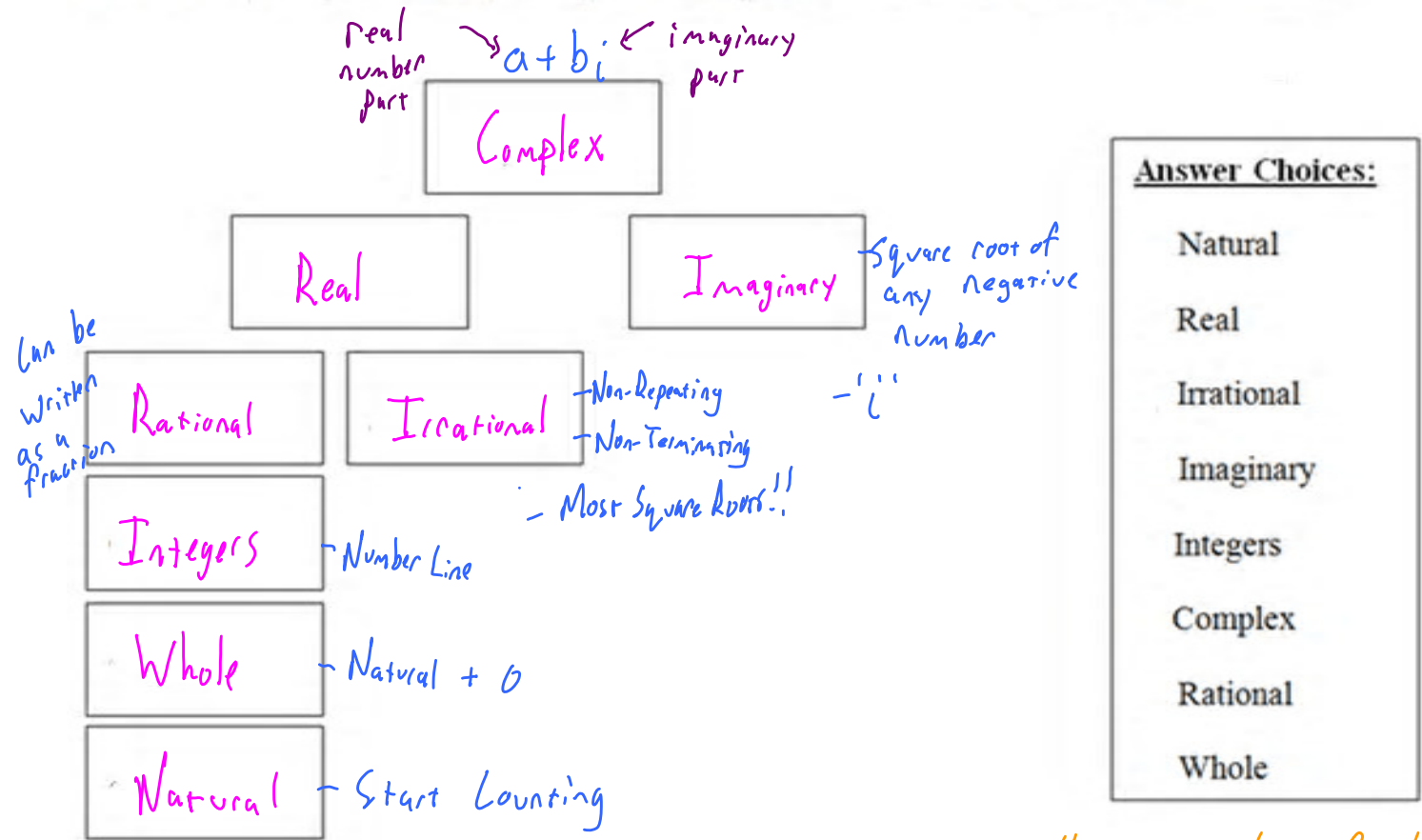


Section 4.6 (Day 1) Operations within the Complex Number System

Accurately complete the graphic organizer to represent how all sets of numbers are related.



If a number is a member of a set, it is automatically a member of the set or sets above it.

Determine which sets the following numbers belong to. Remember, every number is Complex!!!

1. $3i \rightarrow$ Imaginary, Complex

2. $-35 \rightarrow$ Integers, Rational, Real, Complex

3. $0 \rightarrow$ Whole, Integers, Rational, Real, Complex

4. $\sqrt{5} \rightarrow$ Irrational, Real, Complex

5. $2 \rightarrow$ Natural, Whole, Integers, Rational, Real, Complex

Treat 'i' Like a Variable

Addition/Subtraction of Complex Numbers

- Combine real number parts and imaginary number parts
- Write expression in standard form: $a + bi$

Examples:

1) $-i + 3i$

$$2i$$

2) $-9i - 15i$

$$-24i$$

3) $(-5 - 3i) + (5 - 5i)$

$$-5 - 3i + 5 - 5i$$

$$-8i$$

4) $(13 - 6i) - (-3 + 2i)$

$$13 - 6i + 3 - 2i$$

$$16 - 8i$$

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

$$-7 + 6i + 2i - 4 + 3i$$

$$-11 + 11i$$

Multiplication of Complex Numbers

- Multiply
- Write expression in standard form
- Remember $i^2 = -1$

1) $(2i)(9i)$

$$18i^2$$
$$18(-1) \quad (-18)$$

2) $(-3i)(7i)$

$$-21i^2$$
$$-21(-1) \quad (21)$$

3) $-6(8 + 4i)$

$$-48 - 24i$$

4) $5i(6 - 3i)$

$$30i - 15i^2$$

$$30i - 15(-1)$$

$$30i + 15$$

$$15 + 30i$$

5) $(2 - 3i)(5 + 9i)$

$$10 + 18i - 15i - 27i^2$$

$$10 + 3i - 27(-1)$$

$$10 + 3i + 27$$

$$37 + 3i$$

6) $(6 + 5i)(6 - 8i)$

$$36 - 48i + 30i - 40i^2$$

$$36 - 18i - 40(-1)$$

$$36 - 18i + 40$$

$$76 - 18i$$

7) $(5 - 2i)(5 + 2i)$

$$25 - 4i^2$$

$$25 - 4(-1)$$

$$25 + 4$$

$$(29)$$

8) $(7 + 12i)(7 - 12i)$

$$49 - 144i^2$$

$$49 - 144(-1)$$

$$49 + 144$$

$$(193)$$

9) $(3 - 2i)^2$

$$(3 - 2i)(3 - 2i)$$

$$9 - 6i - 6i + 4i^2$$

$$9 - 12i + 4(-1)$$

$$9 - 12i - 4$$

$$5 - 12i$$