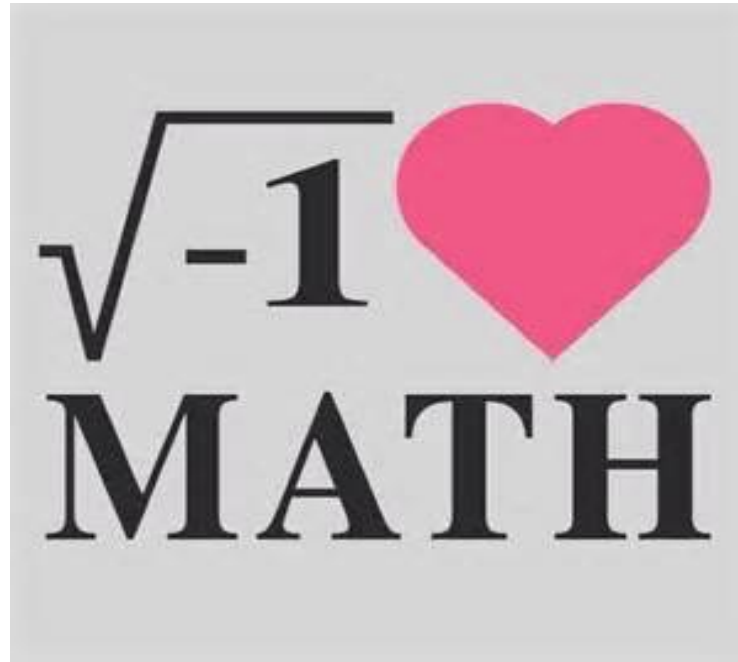# Lesson 1.3.1: Defining Complex Numbers, i, and i^2

By the end of this lesson, I will be able to answer the following questions…

1. How are complex numbers and real numbers related?

2. How do we rewrite radicals in imaginary units (and back)?

3. What is the definition of i and i^2 ?

4. How are imaginary number used in applications involving electricity?

Vocabulary

- **Imaginary Unit**

  The letter i, used to represent the non-real value, $i=-1$

- **Complex Number**
  - Standard Form

  A number in the form $a + bi$, where a and b are real numbers, and i is the imaginary unit

Prerequisite Skills with Practice

Simplify the following radicals (not using a calculator.)

$$\sqrt{75} \qquad 3\sqrt{12} \qquad \sqrt{196} \qquad 2\sqrt{34}$$

In your own words, explain why $\sqrt{-4} \neq -2$

Identify the real and imaginary parts of the complex number:

$$8 + \frac{1}{3}i$$

Example two

Rewrite the complex number 2i using a radical.

Example three

Rewrite the radical $\sqrt{-32}$ using the imaginary unit i.

Example four

We know that $i = \sqrt{-1}$
That said, make a prediction as to what i^2 equals.

Bob "Thunder" Bolt
- Lead Singer of the
Imaginary Number Dragons

THE END

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