Quick Reference Sheet

Scientific Notation

All About Scientific Notation:

- When a number is written in scientific notation, there is only one non-zero number in front of the decimal. That number is multiplied by an exponent with a base of ten.
- If a number written in scientific notation has a negative exponent, it means the number is less than one but greater than zero.
- If a number written in scientific notation has a positive exponent, it means the number is greater than one.

Writing in Scientific Notation:

- Move the decimal the left or right until there is a single digit (not zero) in front of the decimal.
- Count the number of places the decimal was moved. This becomes your exponent.
- If you moved the decimal to the right, the exponent will be negative.
- If you moved the decimal to the left, the exponent will be positive.
- Write the number as $x.xx \cdot 10^{\#}$

Add & Subtract:

You can add and subtract two expressions written in scientific notation.

1. Raise all powers of 10 to the same exponent by moving the decimal point left or right (changing the power of ten). Move left if you are increasing an exponent and right if you are decreasing it.
2. Add or subtract the constants.

$$6.4 \cdot 10^5 + 3.2 \cdot 10^8$$

$$0.0064 \cdot 10^8 + 3.2 \cdot 10^8$$

$$(0.0064 + 3.2) \cdot 10^8$$

$$3.2064 \cdot 10^8$$

Multiply & Divide:

You can multiply and divide two numbers written in scientific notation.

1. Split the expressions into constants and powers of ten.
2. Multiply the constants.
3. Multiply the powers of ten (using the product rule).
4. Write your answer in scientific notation.

$$(6.4 \cdot 10^5)\ (3.2 \cdot 10^8)$$

$$(6.4 \cdot 3.2)\ (10^5 \cdot 10^8)$$

$$(20.48) \cdot 10^{13}$$

$$20.48 \cdot 10^{13}$$

$$2.048 \cdot 10^{14}$$