Honors Algebra Warm Up 3/29

The diameter of the Moon is $3.475 \times 10^6$ m.
What is the diameter of the Moon written as an ordinary number?

\[3,475,000 \text{ m} \quad \text{3 475 000 m} \]

$0.82 \times 10^{-4}$

Photocopy paper is packaged in reams (500 sheets). The thickness of the pack is 41 mm. What is the thickness of one sheet of paper written in Scientific Notation using meters?

\[
\frac{4.1}{500} = \frac{0.082}{1000}
\]

Area of the whole square = Area of the center square + Area of the four triangle pieces

\[(a + b)^2 = c^2 + 4 \left(\frac{1}{2} ab\right)\]

\[a^2 + 2ab + b^2 = c^2 + 2ab\]

\[a^2 + b^2 = c^2\]
Scientific notation is a modified way of writing numbers...

Like this:

\[ 700 \rightarrow 7 \times 10^2 \]

Or this:

\[ 4,900,000,000 \rightarrow 4.9 \times 10^9 \]

It makes it easy to use big and small values.

**How to Do it**

To figure out the power of 10, think "how many places do I move the decimal point?"

- When the number is 10 or greater, the decimal point has to move **to the left**, and the power of 10 is **positive**.
- When the number is smaller than 1, the decimal point has to move **to the right**, so the power of 10 is **negative**.

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**Performing Operations Using Scientific Notation**

**Addition and Subtraction**

- when adding or subtracting -> convert to the same power of 10 and then add or subtract normally

\[ (4.125 \times 10^{-2}) + (3.2 \times 10^{-4}) = (4.125 \times 10^{-2}) + (0.032 \times 10^{-2}) \]

\[ = 4.247 \times 10^{-2} \]

**Multiplying**

- multiply the digits normally and add the exponents (adjust answer so that only one digit is left of the decimal point)

\[ (3.4 \times 10^6) \times (4.2 \times 10^3) = (3.4)(4.2) \times 10^{6+3} = 14.28 \times 10^9 \]

\[ = 1.428 \times 10^{10} \]

**Dividing**

- divide the digits normally and subtract the exponents (adjust answer so that only one digit is left of the decimal point)

\[ (6.4 \times 10^6) / (8.9 \times 10^2) = \frac{6.4}{8.9} \times 10^{6-2} = 0.719 \times 10^4 \]

\[ = 7.19 \times 10^3 \]
Quizlet Live
Each team will receive all the same questions (in a different order)
You may not have the answer to the question as one of your choices but someone on your team always will
If at any point any of your group members selected an answer that is not the best choice available you will have to **start the entire sequence over** (communicate)
The first team to correctly answer every question in a row will **win the game**

https://quizlet.com/198787004/scientific-notation-flash-cards/

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Looking at a number cubed or the cube root of a number

**Cubed**

\[3^3 = 3 \times 3 \times 3 = 27\]
Using the given blocks determine which numbers are perfect cubes. Record any cubes you can create along with how many blocks you used and the dimensions of the cube itself.

What is the definition of a cube?

How many blocks did your group use to build each cube?

\[ 1^3 = 1 \]
\[ 2^3 = 8 \]
\[ 3^3 = 27 \]
\[ 4^3 = 64 \]
\[ 5^3 = 125 \]
\[ 6^3 = 216 \]
\[ 7^3 = 343 \]
\[ 8^3 = 512 \]
\[ 9^3 = 729 \]
\[ 10^3 = 1000 \]

Using the calculator for cube roots.

![Calculator screenshot](image)
When would you need a cube root?

\[ x^3 = 343 \]

Can you take a the cube root of a negative number?

\[ x^3 = -125 \]

Cube roots are different than square roots because they yield one solution

\[ x^3 = 64 \quad x^2 = 16 \]

\[ x = 4 \quad x = 4 \]

\[ x = 4 \quad \text{Two solutions} \]

One solution