

lesson 7 extra practice compute with scientific notation answer key

Lesson 7 extra practice compute with scientific notation answer key is an essential resource for students who are mastering the concept of scientific notation. Scientific notation is a powerful tool used in mathematics and science to express very large or very small numbers efficiently. This article will provide a comprehensive overview of scientific notation, its applications, and how to tackle extra practice problems effectively.

Understanding Scientific Notation

Scientific notation is a way of expressing numbers that are either very large or very small. It is written in the form:

$$[a \times 10^n]$$

where:

- (a) is a number greater than or equal to 1 and less than 10.
- (n) is an integer, which can be positive or negative.

Why Use Scientific Notation?

There are several reasons why scientific notation is useful:

1. Simplicity: It simplifies calculations involving extremely large or small numbers.
2. Clarity: It provides a clear way to express numbers in a compact form.

3. Precision: It helps in maintaining precision in calculations, especially in scientific fields.

Key Operations with Scientific Notation

When working with scientific notation, there are three primary operations to master: multiplication, division, and addition/subtraction. Understanding these operations is crucial for solving problems effectively.

Multiplying Numbers in Scientific Notation

To multiply numbers in scientific notation, follow these steps:

1. Multiply the coefficients: Multiply the (a) values.
2. Add the exponents: Add the (n) values.

For example:

$$(3 \times 10^4) \times (2 \times 10^3) = (3 \times 2) \times 10^{4+3} = 6 \times 10^7$$

Dividing Numbers in Scientific Notation

To divide numbers in scientific notation, use these steps:

1. Divide the coefficients: Divide the (a) values.
2. Subtract the exponents: Subtract the (n) values.

For example:

$$\begin{aligned} & \left[\frac{6 \times 10^8}{2 \times 10^4} = \frac{6}{2} \times 10^{8-4} = 3 \times 10^4 \right] \end{aligned}$$

Addition and Subtraction with Scientific Notation

Addition and subtraction can be more complex because the numbers must have the same exponent.

Here are the steps:

1. Adjust the exponents: If necessary, convert one of the numbers to have the same exponent as the other.
2. Add or subtract the coefficients: Once the exponents are the same, perform the addition or subtraction on the coefficients.
3. Express the result: If needed, convert the result back into proper scientific notation.

For example:

$$\begin{aligned} & \left[(4 \times 10^5) + (3 \times 10^6) \right] \end{aligned}$$

First, convert (3×10^6) to (30×10^5) :

$$\begin{aligned} & \left[(4 \times 10^5) + (30 \times 10^5) = (4 + 30) \times 10^5 = 34 \times 10^5 = 3.4 \times 10^6 \right] \end{aligned}$$

Extra Practice Problems

Practicing with extra problems is crucial for mastering scientific notation. Here are some sample problems you can work on, along with the answer key at the end:

Sample Problems

1. Multiply: $(5 \times 10^2) \times (3 \times 10^5)$
2. Divide: $\frac{9 \times 10^8}{3 \times 10^2}$
3. Add: $(6 \times 10^3) + (2 \times 10^4)$
4. Subtract: $(5 \times 10^7) - (1 \times 10^6)$
5. Multiply: $(2.5 \times 10^{-3}) \times (4 \times 10^{-2})$

Answer Key for Extra Practice Problems

1. Multiply:

$$\begin{aligned} &[(5 \times 10^2) \times (3 \times 10^5) = 15 \times 10^{2+5} = 1.5 \times 10^6] \end{aligned}$$

2. Divide:

$$\begin{aligned} &[\frac{9 \times 10^8}{3 \times 10^2} = 3 \times 10^{8-2} = 3 \times 10^6] \end{aligned}$$

3. Add:

$$\begin{aligned} &[(6 \times 10^3) + (2 \times 10^4) = (6 \times 10^3) + (20 \times 10^3) = 26 \times 10^3 = 2.6 \times 10^4] \end{aligned}$$

10^4

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4. Subtract:

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$$(5 \times 10^7) - (1 \times 10^6) = (5 \times 10^7) - (0.1 \times 10^7) = (5 - 0.1) \times 10^7 = 4.9 \times 10^7$$

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5. Multiply:

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$$(2.5 \times 10^{-3}) \times (4 \times 10^{-2}) = 10 \times 10^{-5} = 1 \times 10^{-4}$$

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Conclusion

In conclusion, Lesson 7 extra practice compute with scientific notation answer key is a valuable tool for students learning to navigate the world of scientific notation. By understanding how to perform operations like multiplication, division, addition, and subtraction, students can tackle a variety of problems with confidence. Regular practice with these concepts will not only improve mathematical skills but also enhance critical thinking abilities in scientific contexts.

Frequently Asked Questions

What is scientific notation?

Scientific notation is a method of expressing numbers as a product of a coefficient and a power of ten, making it easier to handle very large or very small numbers.

How do you convert a number to scientific notation?

To convert a number to scientific notation, move the decimal point to create a number between 1 and 10 and count the number of places moved to determine the exponent of ten.

What is the scientific notation for 45000?

The scientific notation for 45000 is 4.5×10^4 .

How do you add numbers in scientific notation?

To add numbers in scientific notation, make sure the exponents of ten are the same. If they are not, adjust one or both numbers accordingly, then add the coefficients and keep the common exponent.

What is the result of $(3 \times 10^2) + (2 \times 10^2)$?

The result is 5×10^2 , since both terms have the same exponent.

How do you multiply numbers in scientific notation?

To multiply numbers in scientific notation, multiply the coefficients and add the exponents of ten.

What is the product of (2×10^3) and (3×10^2) ?

The product is 6×10^5 , since $2 \times 3 = 6$ and $3 + 2 = 5$.

How do you divide numbers in scientific notation?

To divide numbers in scientific notation, divide the coefficients and subtract the exponent of the denominator from the exponent of the numerator.

What is $(6 \times 10^4) \div (2 \times 10^2)$?

The result is 3×10^2 , since $6 \div 2 = 3$ and $4 - 2 = 2$.

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