

Adding and Subtracting Scientific Notation

Objective: I can add and subtract very small and very large numbers in scientific notation.

Warm Up: Simplify each expression

1. $(1.1 \times 10^{-3})(2.5 \times 10^9)$
 2.75×10^6

M^AD^S

2. $\frac{9.9 \times 10^{11}}{1.1 \times 10^8}$
 9×10^3

3. Can we simplify the following expressions? [Just answer Yes or No]

(a) $2x^2 + 3x$

No
 (not like terms)

(b) $4x - |x$

Yes = $3x$

(c) $x^3 + 3x^2 + 7x$

No
 (not like terms)

Steps for Adding and Subtracting with Scientific Notation

1. Look to see if the exponents are the same.
 (If they are, skip to step 3)

2. If the exponents are different, move the decimal point in the coefficient to change the exponent.

a) If you moved the decimal to the left, ADD the exponent

b) If you moved the decimal to the right, SUBTRACT the exponent.

3. **Add** or **subtract** the coefficients. Keep the power of 10.

4. Check to make sure your answer is in Scientific Notation; if it's not, convert it!

3.6×10^3	➔	3.6×10^3
$+ 9.7 \times 10^2$		$+ 0.97 \times 10^3$
		4.57×10^3
		↑ final answer

* Match to the larger exponent!

Exercise 1- Find the sum:

a. $(2.3 \times 10^3) + (6.9 \times 10^3)$ same exponent!
ADD and keep the power!
 9.2×10^3

b. $(4.81 \times 10^3) + (7.913 \times 10^5)$ Add 2, move Left 2.
+2
(0.0481 × 10⁵) + (7.913 × 10⁵)
 7.9611×10^5

Exercise 2- Find the difference:

a. $(6.1 \times 10^4) - (2.43 \times 10^2)$ +2
(6.1 × 10⁴) - (0.0243 × 10⁴)
 6.0757×10^4

b. $(7.61 \times 10^6) - (2.87 \times 10^4)$ +2
(7.61 × 10⁶) - (0.0287 × 10⁶)
 7.5813×10^6

Exercise 3-Evaluate the following expression: $(6.3 \times 10^5) + 2,700,000$
 (2.7×10^6)

$$\begin{array}{r} 0.63 \\ + 2.70 \\ \hline 3.33 \end{array}$$

$$3.33 \times 10^6$$

LA.RS

Problem Set:

<p>1) $(7.38 \times 10^8) - (1.61 \times 10^7)$ $.161 \times 10^8$</p> $\begin{array}{r} 7.380 \\ - 0.161 \\ \hline 7.219 \end{array}$ 7.219×10^8	<p>2) $(8.41 \times 10^3) + (9.71 \times 10^4)$ $.841 \times 10^4$</p> $\begin{array}{r} 10.551 \times 10^4 \\ \text{LA} \\ \hline 1.0551 \times 10^5 \end{array}$
<p>3) $(1.263 \times 10^9) - (1.525 \times 10^7)$ $.01525 \times 10^9$</p> 1.24775×10^9	<p>4) $(2.85 \times 10^7) + (1.61 \times 10^9)$ $.0285 \times 10^9$</p> 1.6385×10^9

5. In 2018, the US had a Gross Domestic Product (GDP) of 1.948×10^{13} . The United Kingdom had a GDP of 2.68×10^{12} . What were the combined GDPs of the US and the UK, in 2018?

ADD

$$(1.948 \times 10^{13}) + (2.68 \times 10^{12}) = 2.216 \times 10^{13}$$