Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples	
ADDING & SUBTRACTING NUMBERS IN SCI. NOTATION	In order to add or subtract numbers written in scientific notation, they must have the **SAME EXPONENT**. (Think like terms!)	
	① Use LARS on one of the numbers to adjust the exponent so that it is the same as the other number.	
	② Add or subtract the numbers.	
	③ KEEP the common exponent!	
	④ Use LARS again to adjust the decimal if needed to ensure it's in correct scientific notation form.	
EXAMPLES	**1.** $(8\times10^{3})+(5\times10^{2})$ $8\times10^{3}+.5\times10^{3}$ 8.5×10^{3}	**2.** $(6\times10^{10})-(1.2\times10^{11})$ $.6\times10^{11}-1.2\times10^{11}$ -0.6×10^{11} -6×10^{10}
	3. $(8.1\times10^{-1})-(4\times10^{-2})$ $8.1\times10^{-1}-0.4\times10^{-1}$ 7.7×10^{-1}	**4.** $(9.4\times10^{-6})+(2.7\times10^{-7})$ $9.4\times10^{-6}+.27\times10^{-6}$ 9.67×10^{-6}
	5. $(5\times10^{6})-(3\times10^{4})$ $5\times10^{6}-.03\times10^{6}$ 4.97×10^{6}	**6.** $(2\times10^{5})+(6.4\times10^{8})$ $.002\times10^{8}+6.4\times10^{8}$ 6.402×10^{8}
	7. $(1.4\times10^{-1})+(5.1\times10^{2})$ $.0014\times10^{2}+5.1\times10^{2}$ 5.1014×10^{2}	**8.** $(3.8\times10^{-5})-(9.4\times10^{-7})$ $3.8\times10^{-5}-.094\times10^{-5}$ 3.706×10^{-5}
	9. $(7.2\times10^{-15})+(2.9\times10^{-16})$ $7.2\times10^{-15}+.29\times10^{-15}$ 7.49×10^{-15}	**10.** $(8.5\times10^{1})-(2\times10^{-1})$ $8.5\times10^{1}-.02\times10^{1}$ 8.48×10^{1}

11. Find the sum of 4.1×10^1 and 7.7×10^3.

$(4.1 \times 10^1) + (7.7 \times 10^3)$

$.041 \times 10^3 + 7.7 \times 10^3$

$\boxed{7.741 \times 10^3}$

12. Find the difference of 6.5×10^{-6} and 1.9×10^{-7}.

$(6.5 \times 10^{-6}) - (1.9 \times 10^{-7})$

$6.5 \times 10^{-6} - .19 \times 10^{-6}$

$\boxed{6.31 \times 10^{-6}}$

APPLICATIONS

13. In 2013, the national debt was approximately 1.8×10^{13} dollars. In 2014, the debt grew by 3.3×10^{11} dollars. Find the total debt at the end of 2014. Give your answer in scientific notation.

$(1.8 \times 10^{13}) + (3.3 \times 10^{11}) = 1.8 \times 10^{13} + .033 \times 10^{13}$

$= \boxed{1.833 \times 10^{13} \text{ dollars}}$

14. Jupiter is approximately 4.84×10^8 miles from the sun while Neptune is approximately 2.8×10^9 miles to the sun. How many miles closer to the sun is Jupiter than Neptune? Give your answer in scientific notation.

$(2.8 \times 10^9) - (4.48 \times 10^8) = 2.8 \times 10^9 - 0.484 \times 10^9$

$= \boxed{2.316 \times 10^9 \text{ miles}}$

15. At a certain company, the employee with the largest salary, the CEO, makes 1.38×10^7 dollars per year. The employee with the smallest salary makes 4.8×10^4 dollars per year. Find the range in salary. Give your answer in scientific notation.

$(1.38 \times 10^7) - (4.8 \times 10^4) = 1.38 \times 10^7 - .0048 \times 10^7$

$= \boxed{1.3752 \times 10^7 \text{ dollars}}$

16. Find 2.9×10^{-5} less than the product of 6.4×10^{-3} and 5×10^{-4}. Give your answer in scientific notation.

$(6.4 \times 10^{-3})(5 \times 10^{-4}) - 2.9 \times 10^{-5}$

$32 \times 10^{-7} - 2.9 \times 10^{-5}$

$3.2 \times 10^{-6} - 29 \times 10^{-6}$

$-25.8 \times 10^{-6} = \boxed{-2.58 \times 10^{-5}}$

Summary: Explain how adding and subtracting numbers written in scientific notation differs from multiplying and dividing.

When adding and subtracting, the scientific notation needs to have the same exponent. When multiplying and dividing, the exponents can be different; multiplying requires you to add exponents and division requires you to subtract exponents.

Name: _____ **Unit 2:** Algebraic Expressions

Date: _____ **Per:** _____ **Homework 10:** Adding & Subtracting Numbers in Scientific Notation

Directions: Evaluate each expression. Give all final answers in scientific notation.

1. $(5\times10^{4})+(4\times10^{5})$

$.5\times10^{5}+4\times10^{5}$

4.5×10^{5}

2. $(2.7\times10^{9})-(9\times10^{8})$

$2.7\times10^{9}-.9\times10^{9}$

1.8×10^{9}

3. $(6.2\times10^{-3})-(1.4\times10^{-4})$

$6.2\times10^{-3}-.14\times10^{-3}$

6.06×10^{-3}

4. $(3.4\times10^{-15})+(8.1\times10^{-14})$

$.34\times10^{-14}+8.1\times10^{-14}$

8.44×10^{-14}

5. $(7\times10^{4})-(2.6\times10^{2})$

$7\times10^{4}-.026\times10^{4}$

6.974×10^{4}

6. $(8.5\times10^{-1})+(5.9\times10^{-4})$

$8.5\times10^{-1}+.0059\times10^{-1}$

8.5059×10^{-1}

6. Find the difference of 4.5×10^{-1} and 2×10^{-2}.

$4.5\times10^{-1}-2\times10^{-2}$

$4.5\times10^{-1}-0.2\times10^{-1}$

4.3×10^{-1}

8. Find the sum of 1.6×10^{2} and 9.2×10^{5}.

$1.6\times10^{2}+9.2\times10^{5}$

$.0016\times10^{5}+9.2\times10^{5}$

9.2016×10^{5}

9. Fill in the missing exponent.

$(6.5\times10^{6})-(2.4\times10^{\boxed{5}})=6.26\times10^{6}$

10. Fill in the missing exponent.

$(8.9\times10^{\boxed{-14}})+(1.7\times10^{-12})=1.789\times10^{-12}$

11. California has a population of approximately 3.9×10^{7} people while Wyoming has a population of approximately 5.8×10^{5} people. How many more people live in California than Wyoming?

$(3.9\times10^{7})-(5.8\times10^{5})$

$3.9\times10^{7}-.058\times10^{7}$ = 3.842×10^{7} people

12. An online company ran a two-day sale. They generated 6.2×10^{5} dollars on the first day and 1.9×10^{6} dollars on the second day. Find the combined revenue for the two days.

$(6.2\times10^{5})+(1.9\times10^{6})$

$.62\times10^{6}+1.9\times10^{6}$ = 2.52×10^{6} dollars

13. Jack bought an external hard drive with 1 TB, or 1×10^{12}, bytes of available space. So far he has used up 7.4×10^{8} bytes. How much space does he have available?

$(1\times10^{12})-(7.4\times10^{8})$

$1\times10^{12}-.00074\times10^{12}$ = 0.99926×10^{12}

9.9926×10^{11} bytes

14. Find the sum of 4.5×10^{-1} and the quotient of 7×10^{-4} and 8×10^{-3}.

$\frac{7\times10^{-4}}{8\times10^{-3}}+4.5\times10^{-1}$ = $.875\times10^{-1}+4.5\times10^{-1}$

= 5.375×10^{-1}