Name _____

Date _____ Period _____

Working With Scientific Notation

Once you know how to read and write numbers in scientific notation, you are ready to learn how to do calculations in scientific notation. Addition and subtraction follow a few simple rules: (1) numbers must be a multiple of the same power of 10; (2) the first factor can then be added or subtracted; and (3) the power of 10 is not affected. See the example to the right

Example
$$1.35 \times 10^5 + 2.9 \times 10^4$$

Procedure
① $\qquad 2.9 \times 10^4 = 0.29 \times 10^5$
② $\qquad \quad 0.29 \times 10^5$
$\qquad \quad \underline{+ 1.35 \times 10^5}$
$\qquad \quad \ 1.64 \times 10^5$

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Multiplication follows a different set of rules: (1) multiply the first factors; and (2) add the exponents. See below.

Example
$$(2 \times 10^4) \times (1.5 \times 10^3)$$

Result
$$3.0 \times 10^7$$

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Division follows still a third set of rules: (1) divide the first factors; and (2) subtract exponents

Example
$$\frac{3.0 \times 10^5}{2.0 \times 10^3}$$

Result
$$1.5 \times 10^2$$

Based on the instructions and examples above, answer the questions below.

1) $2.1 \times 10^3 + 2.1 \times 10^2$ _____

2) $3.25 \times 10^5 - 5.2 \times 10^3$ _____

3) $8.7 \times 10^6 + 3.1 \times 10^7$ _____

4) $9.63 \times 10^5 + 8.81 \times 10^4$ _____

5) $1.3 \times 10^{-4} - 5.6 \times 10^{-5}$ _____

6) $9.11 \times 10^{-1} + 3.27 \times 10^{-2}$ _____

7) $4.2 \times 10^1 + 9.7 \times 10^{-1}$ _____

8) $6.7 \times 10^0 - 1.3 \times 10^{-1}$ _____

9) $5.55 \times 10^3 + 9.46 \times 10^4$ _____

10) $7.0 \times 10^5 + 8.1 \times 10^3$ _____

11) $3.72 \times 10^{-2} - 8.45 \times 10^{-4}$ _____

12) $8.7 \times 10^{-9} + 9.4 \times 10^{-10}$ _____

13) $(5.7 \times 10^4) \times (3.1 \times 10^2)$ _____

14) $(4.5 \times 10^3) \div (1.5 \times 10^1)$ _____

15) $(8.8 \times 10^4) \div (2.2 \times 10^5)$ _____

16) $(2.3 \times 10^{-1}) \times (5.0 \times 10^{-1})$ _____

17) $(1.24 \times 10^2) \div (4.0 \times 10^{-2})$ _____

18) $(3.0 \times 10^{-4}) \times (5.5 \times 10^2)$ _____

19) $(6.4 \times 10^3) \times (1.5 \times 10^8)$ _____

20) $(3.3 \times 10^3) \times (2.0 \times 10^{-5})$ _____

21) $(4.9 \times 10^{-2}) \div (7.0 \times 10^{-3})$ _____

22) $(1.1 \times 10^7) \div (5.5 \times 10^4)$ _____

23) $(7.2 \times 10^{-6}) \times (1.4 \times 10^9)$ _____

24) $(9.6 \times 10^5) \div (1.2 \times 10^7)$ _____