



Name: \_\_\_\_\_

Class: M 2/\_\_\_\_ Number: \_\_\_\_\_

**Worksheet 6 Exponents****Scientific Notation**Real numbers expressed in **scientific notation** have the form

$$a \times 10^n$$

where  $n$  is an integer and  $1 \leq a < 10$ . This form is particularly useful when the numbers are very large or very small.

For example,

$$9,460,000,000,000,000 \text{ m} = 9.46 \times 10^{15} \text{ m} \quad \text{One light year}$$

$$0.000000000025 \text{ m} = 2.5 \times 10^{-11} \text{ m} \quad \text{Radius of a hydrogen atom}$$

**Rewrite this numbers in standard form (decimal form).**

1)  $563.4 \times 10^5 = \dots\dots\dots$

2)  $0.054 \times 10^6 = \dots\dots\dots$

3)  $0.00634 \times 10^5 = \dots\dots\dots$

**Rewrite this numbers in scientific notation.**

1) 2,500 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

2) 38,720 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

3) 82,400 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

4) 396,000 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

5) 12,680,000 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

6) 510,000,000 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

7) 0.05 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

8) 0.00064 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

9) 0.00000234 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

10) 0.000000745 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

11) 0.000000846 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$

12) 0.000000000932 =  $\dots\dots\dots \times 10^{\dots\dots\dots}$



**Example 1:** Multiply:  $(4.2 \times 10^{-5})(0.3 \times 10^{12})$ .

Answer .....  $\times 10$  —

**Example 2:** Divide:  $(3.24 \times 10^8) \div (9.0 \times 10^{-3})$ .

Answer .....  $\times 10$  —

**Example 3:** The speed of light is approximately  $6.7 \times 10^8$  miles per hour. Express this speed in miles per second.

Answer .....  $\times 10$  —

**Evaluate the expression. Write the result in scientific notation.**

1)  $(3 \times 10^8)(7 \times 10^9)$  = .....  $\times 10$  —

2)  $(2.2 \times 10^{-8})(3.6 \times 10^{23})$  = .....  $\times 10$  —

3)  $(4 \times 10^{-4})(1.2 \times 10^{15})$  = .....  $\times 10$  —

4)  $(2.5 \times 10^{-7})(2.5 \times 10^{22})$  = .....  $\times 10$  —

5)  $(0.4 \times 10^{-11})(-22 \times 10^{12})(0.3 \times 10^{25})$  = .....  $\times 10$  —

6)  $(a \times 10^{-13})(b \times 10^{-29})(c \times 10^{35})$  = .....  $\times 10$  —

7)  $\frac{(8 \times 10^{-9})}{(4 \times 10^{-7})}$  = .....  $\times 10$  —



$$8) \frac{3.6 \times 10^{-5}}{0.6 \times 10^{-2}} = \dots \times 10 \text{---}$$

$$9) \frac{(4 \times 10^{-8})(5.5 \times 10^{-6})}{(1.1 \times 10^{-12})} = \dots \times 10 \text{---}$$

$$10) \frac{(2.4 \times 10^{-4})(4 \times 10^{-7})}{8 \times 10^{-11}} = \dots \times 10 \text{---}$$

$$11) \frac{2.5 \times 10^7}{0.5 \times 10^{-11}} = \dots \times 10 \text{---}$$

$$12) \frac{0.000062}{0.002} = \dots \times 10 \text{---}$$

$$13) \frac{0.00000056 \times 10^{-4}}{0.0008 \times 10^{-5}} = \dots \times 10 \text{---}$$

$$14) \frac{(0.01 \times 10^{-11})(5.5 \times 10^{18})}{(1.1 \times 10^{-7})} = \dots \times 10 \text{---}$$

$$15) \frac{(3.4 \times 10^{14}) \div (0.2 \times 10^{-5})}{(1.7 \times 10^{-5})} = \dots \times 10 \text{---}$$

$$16) \frac{(12.5 \times 10^6) \times (3.9 \times 10^{15})}{6.5 \times 10^{13}} = \dots \times 10 \text{---}$$

$$17) \frac{0.016 \times 0.0028}{0.0064} = \dots \times 10 \text{---}$$

**Solve the problem.**

1. The mass of earth is  $5.97 \times 10^{24}$  kilograms and the mass of the moon is  $7.35 \times 10^{22}$  kilograms. By what factor is the mass of earth greater than the mass of the moon?

Answer  $\dots \times 10 \text{---}$