

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

**Answer key**

Score : \_\_\_\_\_

**Scientific Notation**

Mul/Div: ES1

Simplify and express in scientific notation:

Example 1

$$\begin{aligned} &(6 \times 10^3) (2 \times 10^5) \\ &(6 \times 10^3) (2 \times 10^5) = 12 \times 10^3 \times 10^5 \\ &= 12 \times 10^8 \\ &= 1.2 \times 10^9 \end{aligned}$$

Example 2

$$\begin{aligned} \frac{18 \times 10^6}{4 \times 10^4} &= \frac{18}{4} \times 10^6 \times 10^{-4} \\ &= 4.5 \times 10^2 \end{aligned}$$

Simplify each problem and express the answer in scientific notation.

1)  $(7 \times 10^8) (9 \times 10^6)$



Answer :  $6.3 \times 10^{15}$

2)  $\frac{3 \times 10^4}{8 \times 10}$

Answer :  $3.75 \times 10^2$

3)  $\frac{4 \times 10^9}{5 \times 10^7}$

Answer :  $8 \times 10$

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

Answer :  $6 \times 10^7$

5)  $(3 \times 10^7) (9 \times 10^6)$

Answer :  $2.7 \times 10^{14}$

6)  $\frac{4 \times 10^5}{16 \times 10^2}$

Answer :  $2.5 \times 10^2$

7)  $\frac{9 \times 10^5}{10 \times 10^3}$

Answer :  $9 \times 10$

8)  $(11 \times 10^4) (7 \times 10^2)$

Answer :  $7.7 \times 10^7$

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

**Answer key**

Score : \_\_\_\_\_

**Scientific Notation**

Add/Sub: ES1

Simplify and express in scientific notation:

Example 1

$$\begin{aligned}(2 \times 10^4) + (3 \times 10^5) \\ &= (2 \times 10^4) + (3 \times 10^4) \times 10 \\ &= (2 \times 10^4) + (30 \times 10^4) \\ &= 32 \times 10^4 \\ &= \mathbf{3.2 \times 10^5}\end{aligned}$$

Example 2

$$\begin{aligned}(7 \times 10^8) - (4 \times 10^6) \\ &= (7 \times 10^6) \times 10^2 - (4 \times 10^6) \\ &= (700 \times 10^6) - (4 \times 10^6) \\ &= 696 \times 10^6 \\ &= \mathbf{6.96 \times 10^8}\end{aligned}$$

Simplify each problem and express the answer in scientific notation.

1)  $(2 \times 10^3) + (5 \times 10^5)$

Answer :  $5.02 \times 10^5$

2)  $(4 \times 10^8) - (9 \times 10^7)$

Answer :  $3.1 \times 10^8$

3)  $(8 \times 10^9) - (3 \times 10^7)$

Answer :  $7.97 \times 10^9$

4)  $(5 \times 10^7) + (1 \times 10^6)$

Answer :  $5.1 \times 10^7$

5)  $(4 \times 10^2) + (7 \times 10^3)$

Answer :  $7.4 \times 10^3$

6)  $(9 \times 10^5) - (6 \times 10^4)$

Answer :  $8.4 \times 10^5$

7)  $(1 \times 10^6) - (8 \times 10^4)$

Answer :  $9.2 \times 10^5$

8)  $(5 \times 10^9) + (3 \times 10^8)$

Answer :  $5.3 \times 10^9$

10.7

Practice  
For use after Lesson 10.7

Find the sum or difference. Write your answer in scientific notation.

1.  $(2 \times 10^4) + (7.2 \times 10^4)$

~~$1.02 \times 10^5$~~   
 ~~$1.02 \times 10^5$~~   
 $9.2 \times 10^4$

2.  $(3.2 \times 10^{-2}) + (9.4 \times 10^{-2})$

$12.6 \times 10^{-2}$   
 $1.26 \times 10^{-1}$

3.  $(6.7 \times 10^5) - (4.3 \times 10^5)$

$3.4 \times 10^5$

4.  $(8.9 \times 10^{-3}) - (1.9 \times 10^{-3})$

$7.0 \times 10^{-3}$

Find the product or quotient. Write your answer in scientific notation.

5.  $(6 \times 10^8) \times (4 \times 10^6)$

$24 \times 10^{14}$   
 $2.4 \times 10^{15}$

6.  $(9 \times 10^{-3}) \times (9 \times 10^{-3})$

$81 \times 10^{-6}$   
 $8.1 \times 10^{-5}$

7.  $(8 \times 10^3) \div (2 \times 10^2)$

$4 \times 10^1$

8.  $(2.34 \times 10^5) \div (7.8 \times 10^5)$

$0.3 \times 10^0$   
 $3 \times 10^{-1}$

9. How many times greater is the radius of a basketball than the radius of a marble?



Radius =  $1.143 \times 10^1$  cm



Radius =  $5 \times 10^{-1}$  cm

R Basketball

R marble

$\frac{1.143 \times 10^1 \text{ cm}}{5 \times 10^{-1} \text{ cm}}$

$28.6 = 2.86 \times 10^1$

### Operations with Scientific Notation

Add or Subtract the following numbers that are in scientific notation. Make sure your final answer is in proper scientific notation.

$$1) 5 \times 10^3 + 4.3 \times 10^4 = 48 \times 10^3 = 4.8 \times 10^4$$

$\downarrow \quad \downarrow$   
 $43 \quad 10^3$

$$2) 2.3 \times 10^{-4} - 6 \times 10^{-5} = 1.7 \times 10^{-4}$$

$\downarrow$   
 $0.6 \quad 10^{-4}$

$$3) 4 \times 10^5 + 3.3 \times 10^6 = 37 \times 10^5 = 3.7 \times 10^6$$

$\downarrow$   
 $33 \times 10^5$

$$4) 7.2 \times 10^{-2} + 5.3 \times 10^{-1} = 4.58 \times 10^{-1}$$

$\downarrow$   
 $.72 \times 10^{-1}$

$$5) 9.2 \times 10^{10} - 8.4 \times 10^{11} = 8.36 \times 10^{10}$$

$\downarrow$   
 $.84 \quad 10^{10}$

Multiply or Divide the following numbers that are in scientific notation. Make sure your final answer is in proper scientific notation.

$$1) (3.5 \times 10^5) \times (4 \times 10^3) = 14 \times 10^8 = 1.4 \times 10^9$$

$$2) (9 \times 10^4) / (3 \times 10^2) = 3 \times 10^2$$

$$3) (5 \times 10^6) \times (7 \times 10^8) = 35 \times 10^{14} = 3.5 \times 10^{15}$$

$$4) (7.5 \times 10^5) / (2.5 \times 10^3) = 3 \times 10^2$$

$$5) (4.5 \times 10^3) / (2 \times 10^6) = 2.25 \times 10^{-3}$$



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

Score : \_\_\_\_\_

Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

## Operations with Scientific Notation

Simplify. Write each answer in scientific notation. Round to the nearest thousandth if needed.

1)  $(6 \times 10^2)(7 \times 10^4)$

$$\frac{42 \times 10^6}{4.2 \times 10^7}$$

2)  $\frac{7 \times 10^5}{5 \times 10^6}$

$$1.4 \times 10^{-1}$$

3)  $(4 \times 10^5)^3$

$$\frac{(4 \times 10^5)(4 \times 10^5)(4 \times 10^5)}{256 \times 10^{15}} \\ 2.56 \times 10^{13}$$

4)  $(8 \times 10^4)(1.2 \times 10^3)$

$$9.6 \times 10^{-7}$$

5)  $(9.1 \times 10^6)(7 \times 10^2)$

$$63.7 \times 10^8$$

6)  $(6 \times 10^5)^{-3}$

$$4.588 \times 10^{-15}$$

7)  $(3.5 \times 10^3)^3$

$$\frac{(3.5 \times 10^3)(3.5 \times 10^3)(3.5 \times 10^3)}{42.875 \times 10^9} \\ 4.2875 \times 10^{10}$$

8)  $(7.6 \times 10^3)^{-3} = 2.2 \times 10^{-12}$

$$\frac{1}{(7.6 \times 10^3)(7.6 \times 10^3)(7.6 \times 10^3)}$$

$$\frac{1}{438976 \times 10^9} = 0.0022 \times 10^{-12}$$

9)  $\frac{5 \times 10^2}{4.26 \times 10^3}$

$$1.174 \times 10^{-1}$$

10)  $\frac{9.5 \times 10^{-6}}{4 \times 10^{-2}}$

$$2.375 \times 10^{-4}$$

11)  $\frac{4.5 \times 10^4}{9.97 \times 10^5}$

$$\frac{0.451 \times 10^{-1}}{4.51 \times 10^0}$$

12)  $(2.26 \times 10^{-2})(9 \times 10^{-4})$

$$\frac{20.34 \times 10^{-6}}{2.034 \times 10^{-5}}$$

Hard!  
ok if  
you did  
not  
get

Hard!  
ok if  
you did  
not  
get

