Name: _____

Sec. 8.4: Use Scientific Notation

Scientific Notation: A number written in the form $c \times 10^n$ where:

- $1 \leq c < 10$
- n is an integer

Converting from standard form to scientific notation:

Move the decimal from its position in _____ form to where it needs to be to satisfy the inequality $1 \leq c < 10$. The _____ of places and the _____ you move the decimal will dictate the _____ of 10 used in scientific notation.

45.700 =

0.0000457 =

Converting from scientific notation to standard form:

Move the decimal the _____ of places and _____ indicated by the power of 10 in scientific notation.

3.85×10^6 =

3.85×10^{-6} =

Multiplying/Dividing numbers in scientific notation:

Multiply or divide the _____; then use our rules of exponents to determine the power of 10 in the result. You might need to _____ your answer if the coefficient does not satisfy the requirement $1 \leq c < 10$.

$(3 \times 10^8) \cdot (1.5 \times 10^{-3})$ =

$(4 \times 10^5) \div (8 \times 10^{-4})$ =

Examples of scientific notation in the real world:

- Avogadro's number: 6.022×10^{23}
- Approximate distance between carbon atoms in diamond: 1.54×10^{-10} m (or 1.54 Å)

Examples

1. Write 5,480,000 in scientific notation.

2. Write 0.574×10^{8} in scientific notation.

3. Write 9.54×10^{-7} in standard notation.

4. Simplify $(8.4 \times 10^{5}) \cdot (3.2 \times 10^{-5})$. Write your answer in scientific notation.

5. Simplify $(8.4 \times 10^{5}) \div (3.2 \times 10^{-5})$. Write your answer in scientific notation.

6. Simplify $(-3 \times 10^{4})^{3}$. Write your answer in scientific notation.

7. Simplify $(2.4 \times 10^{-4})^{-5}$. Write your answer in scientific notation.

Algebra 1 Name_____

Sec. 8.4 Practice Problems

Write each number in scientific notation.

1) 0.61

2) 0.00036

3) 56400

4) 59

5) 0.018

6) 71.8×10^{-3}

7) 83400

8) 30.7×10^{-1}

Write each number in standard notation.

9) 6×10^{4}

10) 9×10^{-4}

11) 2×10^{0}

12) 9.82×10^{-5}

Write each number in scientific notation.

13) 0.000995

14) 6.16

Simplify. Write each answer in scientific notation.

15) $(8.1 \times 10^{-2})(8.4 \times 10^{2})$

16) $(4 \times 10^{-5})(9.3 \times 10^{3})$

17) $(3.6 \times 10^{0})(3 \times 10^{-5})$

18) $(9.9 \times 10^{-6})(2.04 \times 10^{-1})$

19) $(1.4 \times 10^{3})(5.2 \times 10^{1})$

20) $(6.2 \times 10^{2})(6.9 \times 10^{2})$

21) $\dfrac{6.8 \times 10^{1}}{9.81 \times 10^{2}}$

22) $\dfrac{2.7 \times 10^{-6}}{3.8 \times 10^{3}}$

23) $\dfrac{5 \times 10^{-3}}{3 \times 10^{-5}}$

24) $\dfrac{4.5 \times 10^{-2}}{5.42 \times 10^{0}}$

25) $\frac{4.12 \times 10^{5}}{4 \times 10^{-3}}$

26) $\frac{6 \times 10^{4}}{5.44 \times 10^{5}}$

27) $\frac{0.74 \times 10^{0}}{35 \times 10^{-1}}$

28) $\frac{2 \times 10^{-1}}{0.2 \times 10^{-1}}$

29) $\left(8 \times 10^{-5}\right)^{3}$

30) $\left(1.62 \times 10^{-5}\right)^{6}$

31) $\left(1.2 \times 10^{6}\right)^{2}$

32) $\left(7 \times 10^{-3}\right)^{2}$

33) $\left(4 \times 10^{2}\right)^{2}$

34) $\left(6.89 \times 10^{1}\right)^{5}$

35) $\frac{2.4 \times 10^{-2}}{5.27 \times 10^{0}}$

36) $\left(0.23 \times 10^{6}\right)\left(6 \times 10^{3}\right)$

Answers to Sec. 8.4 Practice Problems

1) 6.1×10^{-1}
2) 3.6×10^{-4}
3) 5.64×10^{4}
4) 5.9×10^{1}
5) 1.8×10^{-2}
6) 7.18×10^{-2}
7) 8.34×10^{4}
8) 3.07×10^{0}
9) 60000
10) 0.0009
11) 2
12) 0.0000982
13) 9.95×10^{-4}
14) 6.16×10^{0}
15) 6.804×10^{1}
16) 3.72×10^{-1}
17) 1.08×10^{-4}
18) 2.02×10^{-6}
19) 7.28×10^{4}
20) 4.278×10^{5}
21) 6.932×10^{-2}
22) 7.105×10^{-10}
23) 1.667×10^{2}
24) 8.303×10^{-3}
25) 1.03×10^{8}
26) 1.103×10^{-1}
27) 2.114×10^{-1}
28) 10×10^{0}
29) 5.12×10^{-13}
30) 1.808×10^{-29}
31) 1.44×10^{12}
32) 4.9×10^{-5}
33) 1.6×10^{5}
34) 1.553×10^{9}
35) 4.554×10^{-3}
36) 1.38×10^{9}