Algebra 1   7.4

Express numbers in scientific notation*

Find products and quotients of numbers in scientific notation

scientific notation $1,500,000 \longrightarrow sci.$

exponent

standard form $2.73 \times 10^4 \longrightarrow stand.$

activity: triangle puzzles

whiteboards $mult. \Big\}$ answers format

$\left(1 \text{--} 10 \right) \times 10^{?}$ $divide$

1A. 68,700,000,000

1B. 0.0000725

6.87×10^{10}

7.25×10^{-5}

2A. 3.201×10^6

3,201,000

2B. 9.03×10^{-5}

0.0000903

Commutative property of multiplication

Example 3 Multiply with Scientific Notation

Evaluate $(3.5 \times 10^{-3})(7 \times 10^5)$. Express the result in both scientific notation and standard form.

$3.5 \cdot 7 \cdot 10^{-3} \cdot 10^5$

$\rightarrow \boxed{24.5} \times 10^{2}$

2.45×10^3 2450

Answer in sci notation and/or standard form
Follow directions

Evaluate each product. Express the results in both scientific notation and standard form.

3A. $(6.5 \times 10^{12})(8.7 \times 10^{-15})$

56.55×10^{-3} $^{+1}_{-1}$

5.655×10^{-2}

0.05655

$.05655$

3B. $(7.8 \times 10^{-4})^2$

$7.8 \times 10^{-4} \cdot 7.8 \times 10^{-4}$

60.84×10^{-8} $^{+1}_{-1}$

$60000.6.084 \times 10^{-7}$

0.0000006084

Grouping

Example 4 Divide with Scientific Notation

Evaluate $\dfrac{3.066 \times 10^8}{7.3 \times 10^3}$. Express the result in both scientific notation and standard form.

$\rightarrow \boxed{0.42} \times 10^{5 \ +1 \ \ominus}$

4.2×10^4

$42,000$

Evaluate each quotient. Express the results in both scientific notation and standard form.

4A. $\dfrac{2.3958 \times 10^3}{1.98 \times 10^8}$

4B. $\dfrac{1.305 \times 10^3}{1.45 \times 10^{-4}}$ $3 + 4$

$1.209949495 \times 10^{-5}$

$00001.2099 \times 10^{-5}$

0.000012099

0.9×10^{7} $+1$ $= 1$

9×10^6

$9,000,000$

Real-World Example 5 Use Scientific Notation

500,000

MUSIC In the United States, a CD reaches gold status once 500 thousand copies are sold. A CD reaches platinum status once 1 million or more copies are sold.

1,000,000

a. Express the number of copies of CDs that need to be sold to reach each status in standard notation.

gold 500,000 -5 (+5) 5×10^5

Plat. 1,000,000 $^{+6}_{-6}$ 1×10^6

b. Write each number in scientific notation.

13,000,000   13

1.3×10^7

c. How many copies of a CD have sold if it has gone platinum 13 times? W your answer in scientific notation and standard form.

Real-World Link

The platinum award was created in 1976. In 2004, the criteria for the award was extended to digital sales. The top-selling artist of all time is the Beatles with 170 million units sold.

Source: Recording Industry Association of America

WB 7. 4 prac.