

Name:
Algebra CC

Date:
Period:

Review of Scientific Notation

Write each number in scientific notation:

1) 0.000000786

$$7.86 \times 10^{-7}$$

2) 1260000

$$1.26 \times 10^6$$

Write each number in standard notation:

3) $7.31 \cdot 10^6$

$$7,310,000$$

4) $5.4 \cdot 10^{-8}$

$$.000000054$$

Write each number in scientific notation:

$$8.84 \times 10^4$$

5) $88.4 \cdot 10^3$

$$2.88 \times 10^{-8}$$

6) $28.8 \cdot 10^{-9}$

Simplify. Write each answer in scientific notation:

7) $(6 \cdot 10^6)(4 \cdot 10^{-1})$

$$24 \times 10^6$$

8) $(3.7 \cdot 10^5) \div (7.4 \cdot 10^8)$

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

9) $(7.68 \cdot 10^2)(9 \cdot 10^6)$

$$69.12 \times 10^8$$
$$6.912 \times 10^9$$

10) $(8.31 \cdot 10^{-3})(6.6 \cdot 10^{-6})$

$$54.846 \times 10^{-9}$$
$$5.4846 \times 10^{-8}$$

Name : _____

Score : _____

Answer key

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) $(7 \times 10^4)(9 \times 10^5)$

Answer : 6.3×10^{15}

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

3.75×10^2

Answer : 0.375×10^3

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

8×10^1

Answer : 0.8×10^2

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

6×10^7

Answer : 0.6×10^8

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

Answer : 2.7×10^{14}

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

2.5×10^2

Answer : 0.25×10^3

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

9×10^1

Answer : 0.9×10^2

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

Answer : 7.7×10^7

Name : _____

Score : _____

Answer key

Simplify each problem and express the answer in scientific notation.

1) $(6 \times 10^{-5}) + (2 \times 10^{-1})$

Answer : 2.0006×10^{-1}

2) $(9 \times 10^4)(5 \times 10^7)$

Answer : 4.5×10^{12}

3) $\frac{8 \times 10^{-6}}{4 \times 10^{-2}}$

Answer : 2×10^{-4}

4) $(3 \times 10^9) - (2 \times 10^6)$

Answer : 2.998×10^9

5) $(9 \times 10^2) - (3 \times 10^{-2})$

Answer : 8.9997×10^2

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

Answer : 6.007×10^7

7) $(5 \times 10^6)(4 \times 10^9)$

Answer : 2×10^{16}

8) $\frac{3 \times 10^{-7}}{8 \times 10^{-3}}$

Answer : 3.75×10^{-5}

9) $(2 \times 10^{-6}) + (7 \times 10^{-3})$

Answer : 7.002×10^{-3}

10) $(5 \times 10^3)(5 \times 10^{-1})$

Answer : 2.5×10^3

Warm Up

You accept a job that pays \$20,000 for the first year. Would you rather receive a raise of \$500 each year or a raise of 3% of your current salary each year? Explain.

<u>Raise Type</u>	<u>\$500 each year</u>	<u>3% of current salary</u>
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Year 1

Year 2

Year 3

$$n \text{ years} = (1.03)^n(20,000)$$

Exponential Growth and Decay

A quantity is changing exponentially if it **increases or decreases** by the same **percent** in each unit of time.

$$y = C(1 \pm r)^t$$

initial amount % of increase/decrease time

Examples:

1. A savings certificate of \$1,000 pays 6.5% annual interest compounded yearly. What is the balance after the certificate matures in 5 years?



Pull

2. A summer youth camp had an enrollment of 320 in 1995. For each of the next five years the enrollment decreased by 2%. What was the enrollment in 2000?



Exponential Growth and Decay

1. When Marc was ten years old he received a certificate of deposit (CD) for \$2000 with an annual interest rate of 5%. After 8 years, how much money will she have in her account?
2. You deposit \$1400 in an account that pays 6% interest compounded yearly. Find the balance after 5 years.
3. You bought a used car for \$18,000. The value of the car will be less each year because of depreciation. The car depreciates at the rate of 12% per year. Estimate the value of your car in 8 years.

4. You bought a used truck for \$15,000. The value of the truck will decrease each year because of depreciation. The truck depreciates at the rate of 8% per year. Find the value of the truck after 5 years.

5. Suppose an initial population of 10,000 people decreases by 2.4% each year. What will the population be after 10 years.

6. Would you rather have an account with an initial value of 500 collecting 2.5% interest yearly for 5 years or an account which collects 3.5% interest yearly for 3 years.