10.7

Operations in Scientific Notation

Rules for Operations

To make scientific notation have a bigger exponent:

- **Move the decimal left**
- **Add the number of times you moved the decimal to the exponent.**

1) 2.4×10^{3}

3) 8.2×10^{-9}

2) 7.1×10^{7}

4) 4.6×10^{-4}

Fixing non-scientific notation

1) 35×10^{8}

2) 215×10^{9}

3) $4{,}587 \times 10^{2}$

Fixing non-scientific notation

4) 0.15×10^{7}

5) 0.00057×10^{9}

6) $.05782 \times 10^{2}$

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

a. $(4.6 \times 10^3) + (8.72 \times 10^3)$

b. $(3.5 \times 10^{-2}) - (6.6 \times 10^{-3})$

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

c. $(2.1 \times 10^{-4}) + (9.74 \times 10^{-4})$

d. $(4.7 \times 10^{5}) - (7.2 \times 10^{3})$

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

e. $(8.2 \times 10^{2}) + (3.41 \times 10^{-1})$

Practice

1) $\left(17\times10^{12}\right)+\left(255\times10^{12}\right)$

2) $\left(340\times10^{-6}\right)-\left(285\times10^{-6}\right)$

Practice

3) $\left(7.545\times10^{8}\right)+\left(4.55\times10^{7}\right)$

4) $\left(8.7\times10^{7}\right)-\left(5.5\times10^{6}\right)$

Adding Integers without a number line

-3 + -5 =

-1 + -3 =

-6 + -2 =

-9+ -14 =

-12 + -8 =

SAME SIGN

- Ignore the signs
- Add numbers
- Put sign back

Adding Integers without a number line

-3 + 5 =

-1 + 6 =

-5 + 9=

5 + -7 =

8 + -6 =

14 + -18 =

DIFFERENT SIGNS

- Ignore the signs
- Subtract
- Put sign back of number that "looks" the biggest

Subtraction is the same as adding the opposite

1. Change the minus sign to addition
2. Change the second number into the opposite
3. Do the problem like a regular addition problem

$5 - 7$ $\qquad$ $3 - (-7)$

$-3 - 6$ $\qquad$ $-5 - (-9)$

Examples

Simplify the following:

$a)\ -7-(-5)$

$b)\ -2-6$

$c)\ 64-(-13)$

$d)\ 17-29$

Review

1) $a^3 \bullet a^2$

2) $b^7 \bullet b^9$

3) $7^4 \bullet 7^5$

4) $10^7 \bullet 10^4$

5) $10 \bullet 10^2 \bullet 10^3$

The Product of Powers Property:

To multiply powers with the same base _____

_____.

The Quotient of Powers Property:

_____base & _____ the exponents.

6) $\frac{n^{24}}{n^{16}}$

7) $\frac{x^{8}}{x^{5}}$

8) $\frac{10^{8}}{10^{5}}$

9) $\frac{10^{15}}{10}$

Lesson

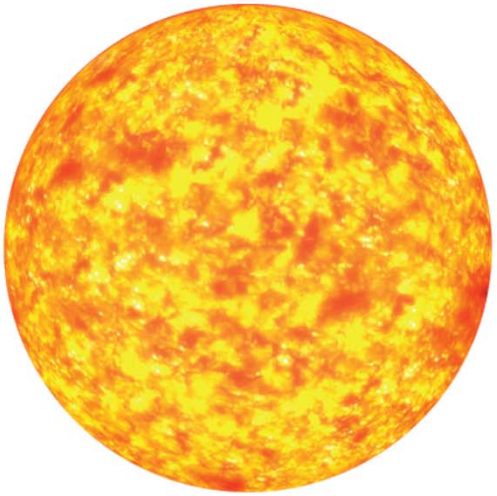
Find $(3 \times 10^{-5}) \times (5 \times 10^{-2})$. Write your answer in scientific notation.

Find $(2 \times 10^{-4}) \times (6 \times 10^{-3})$. Write your answer in scientific notation.

Lesson

Find $\frac{1.5 \times 10^{-8}}{6 \times 10^{7}}$. Write your answer in scientific notation.

Find $\frac{5.3 \times 10^{8}}{4 \times 10^{-3}}$. Write your answer in scientific notation.



Diameter = 1,400,000 km

How many times greater is the diameter of the Sun than the diameter of Earth?

Diameter = 1.28×10^4 km