GUIDED NOTES (MODEL NOTES)

Multiplying Numbers in Scientific Notation

Step 1) Multiply the *decimal numbers (coefficients)*.

Step 2) *Add* the exponents.

Step 3) Rewrite the result in scientific notation.

Remember the number before the decimal point should be *0–9*.

Example $(2.5\times10^{2})\cdot(8.1\times10^{5})$

Step 1) $(2.5)\cdot(8.1)=20.25$

Step 2) $(10^{2})\cdot(10^{5})=10^{7}$

Step 3) Is 20.25×10^{7} written in scientific notation? Why or why not?

No, because the number before the decimal is not between 0 and 9.

Rewriting Numbers in Scientific Notation

Step 1) Move the decimal in the number so there is only *one nonzero digit* before it.

Step 2) Count the number of places and note *the direction* you moved the decimal.

Step 3) Change the exponent:

- If you moved the decimal *left*, add the number of places to the exponent.
- If you moved the decimal *right*, subtract the number of places from the exponent.

How could we write 20.25×10^{7} in scientific notation? 2.025×10^{8}.

Examples

Write each product in scientific notation. Round each answer to two decimal places.

(a) $(3.6\times10^{3})\cdot(5.8\times10^{4})$

2.09×10^{8}

(b) $(9.5\times10^{6})\cdot(1.2\times10^{2})$

1.14×10^{9}

(c) $(4.7\times10^{-3})\cdot(8.1\times10^{-5})$

3.81×10^{-7}

(d) $(2.9\times10^{-1})\cdot(5.8\times10^{-4})$

1.68×10^{-4}

Dividing Numbers in Scientific Notation

Step 1) Divide the *decimal numbers (coefficients)*.

Step 2) *Subtract* the exponents.

Step 3) Rewrite the result in scientific notation.

Examples

Write each quotient in scientific notation. Round each answer to two decimal places.

(a) $(8.0\times10^{6})\div(4.3\times10^{2})$

1.86×10^{4}

(b) $(5.1\times10^{3})\div(3.8\times10^{7})$

1.34×10^{-4}

(c) $\dfrac{1.2\times10^{-5}}{7.2\times10^{3}}$

1.67×10^{-9}

(d) $\dfrac{2.5\times10^{-4}}{6.1\times10^{-2}}$

4.10×10^{-3}