Operations with Scientific Notation

LEVEL 1: The Basics

Q1: Multiply or divide the numbers. Write your final answer in proper scientific notation.

- $(2 \times 10^3) \times (3 \times 10^2) =$
- $(4.8 \times 10^{-1}) \div (1.2 \times 10^{-3}) =$
- $(6.0 \times 10^4) \div (2.0 \times 10^{-1}) =$
- $(6 \times 10^2) \times (1.1 \times 10^3) =$
- $(7.5 \times 10^{-2}) \div (2.5 \times 10^{-5}) =$
- $(1.2 \times 10^3) \div (4 \times 10^6) =$
- $(5 \times 10^{-2}) \times (2 \times 10^4) =$
- $(2.5 \times 10^3) \times (3 \times 10^{-5}) =$
- $(3 \times 10^1) \times (2 \times 10^{-1}) =$
- $(5 \times 10^9) \div (1 \times 10^2) =$

Q2: Perform the following operations and express the answers in scientific notation.

- $(2 \times 10^5) + (3.8 \times 10^5)$
- $(2.7 \times 10^5) + (6.7 \times 10^5)$
- $(9.2 \times 10^8) - (4 \times 10^8)$
- $8.3 \times 10^5) + (3.4 \times 10^5)$
- $(6.33 \times 10^{-9}) - (4.5 \times 10^{-9})$
- $(2.74 \times 10^7) + (5.6 \times 10^7)$
- $(7.2 \times 10^{-6}) + (\ 2.44 \times 10^{-6})$
- $(2.4 \times 10^{-1}) - (5.5 \times 10^{-2})$

Q3: A star emits 2.5×10^8 photons per second. How many photons in 10 seconds?

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LEVEL 2: Dive Deeper

Evaluate the expression. Write your answer in scientific notation.

- $(5.8 \times 10^{-6}) \times (2 \times 10^{-3})$
- $[(2 \times 10^{3}) \times (4 \times 10^{2})] \div (1 \times 10^{4})$
- $(1.2 \times 10^{-5}) \div 4$
- $(1.5 \times 10^{4}) \times (2 \times 10^{-1}) + (3 \times 10^{3})$
- $(7 \times 10^{-8}) + (3.48 \times 10^{-7})$
- $(8.2 \times 10^{-5}) - 0.000\,059$
- $(9.6 \times 10^{-3}) - (7.7 \times 10^{-4})$
- $(1.3 \times 10^{-4})(4.2 \times 10^{11})$
- $(7.2 \times 10^{-1}) \times (4 \times 10^{-7})$
- $3.4 \times 10^{4} + 7.1 \times 10^{5}$
- $(4.2 \times 10^{6}) + (2.25 \times 10^{5}) + (2.8 \times 10^{6})$
- $5{,}200{,}000 \times (8.3 \times 10^{2}) - (3.1 \times 10^{8})$
- $(8.5 \times 10^{3}) - (5.3 \times 10^{3}) - (1.0 \times 10^{2})$
- $\frac{7.8 \times 10^{3}}{1.2 \times 10^{4}}$

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LEVEL 3: Mastering the Concept

Q1: Solve each complex problem, expressing your answer in scientific notation. Show all steps.

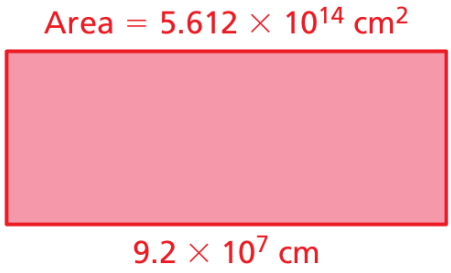
a) $[(3.5 \times 10^{7}) \times (2.0 \times 10^{-3})] + [(8.0 \times 10^{5}) \div (4.0 \times 10^{2})] =$

b) $[(9.0 \times 10^{-2}) - (3.0 \times 10^{-3})] \div [(1.0 \times 10^{-1}) + (2.0 \times 10^{-2})] =$

c) $(1.2 \times 10^{4})^{2} + (3.0 \times 10^{8})$

d) $[(1.0 \times 10^{-1})^{4}] \div (5.0 \times 10^{-6}) - (2.0 \times 10^{2}) =$

Q2: Find the perimeter of the rectangle.



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Extra worksheet:

1) The distance from the Earth to the sun is 9.3 X 10 miles. The distance from the Earth to the moon is 3 X 10 miles. How many times bigger is the distance from Earth to the sun than the distance from Earth to the moon?

2) A rectangular table located in the lobby of a middle school has a length of 2.24×10^3 millimeters and a width of 1.54×10^2 millimeters. Find the area of the rectangular table.

3) A light pulse moves at $3 \times 10^8\ m/s\ in\ 2 \times 10^{-3}$ seconds, how far does it travel?

4) A certain type of bacteria doubles its population every hour. If you start with 1.0×10^3 bacteria, how many bacteria will there be after 5 hours? Express your answer in scientific notation.

5) Error Analysis: A student calculated $(4 \times 10^5) + (3 \times 10^4)\ as\ 7 \times 10^9$.
Explain the mistake and provide the correct solution.

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