

## 2.14 Scientific Notation

*Basic Algebra: One Step at a Time. Pages 227 -234: #19, 21, 22*

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19. 
$$\frac{0.000096}{0.000000008}$$

**Solution:** First convert numerator and denominator to scientific notation:

$$\frac{9.6 \times 10^{-5}}{8 \times 10^{-9}}$$

Divide the numbers, and subtract the exponents:

$$\begin{aligned} & \frac{9.6}{8} \times \frac{10^{-5}}{10^{-9}} \\ & 1.2 \times 10^{-5-(-9)} \\ & 1.2 \times 10^{-5+9} \end{aligned}$$

Final Answer:  $1.2 \times 10^4$

21. 
$$\frac{150,000}{0.00006}$$

**Solution:** First convert numerator and denominator to scientific notation:

$$\frac{1.5 \times 10^5}{6 \times 10^{-5}}$$

Divide the numbers, and subtract the exponents:

$$\begin{aligned} & \frac{1.5}{6} \times \frac{10^5}{10^{-5}} \\ & 0.25 \times 10^{5-(-5)} \\ & 0.25 \times 10^{5+5} \\ & 0.25 \times 10^{10} \end{aligned}$$

This is NOT the final answer, since the number 0.25 is not between 1 and 10!

$$2.5 \times 10^{-1} \times 10^{10}$$

Final Answer:  $2.5 \times 10^9$

22. 
$$\frac{0.00006}{0.0000008}$$

**Solution:** First convert numerator and denominator to scientific notation:

$$\frac{6 \times 10^{-5}}{8 \times 10^{-7}}$$

Divide the numbers, and subtract the exponents:

$$\begin{aligned} & \frac{6}{8} \times \frac{10^{-5}}{10^{-7}} \\ & 0.75 \times 10^{-5-(-7)} \\ & 0.75 \times 10^{-5+7} \\ & 0.75 \times 10^2 \end{aligned}$$

This is NOT the final answer, since the number 0.75 is not between 1 and 10!

$$7.5 \times 10^{-1} \times 10^2$$

Final Answer:  $7.5 \times 10^1$  or 75