

Scientific Notation

Scientific notation is used to express very large or very small numbers. The first number is the coefficient. It must always be greater or equal to 1 and less than 10. The second number is the base and is always to the power of 10 with an exponent.

Tip 1: The number of times you move the decimal is the exponent.

Tip 2: If you move the decimal to the right, the exponent is negative. If you move it to the left, it is positive.

Example 1	Example 2
<p>4,986</p> <p>4,986</p> <p>Scientific Notation 4.986×10^3</p> <p><small>coefficient exponent power of 10</small></p>	<p>0.00169</p> <p>0.00169</p> <p>Scientific Notation 1.69×10^{-3}</p> <p><small>coefficient exponent power of 10</small></p>

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|---------------|------------------------|------------------------------|------------|
| 1. 98,837 | 9.8837×10^4 | 11. 5.3 x 10 ⁻³ | 0.0053 |
| 2. 05022 | 5.022×10^3 | 12. 2.966 x 10 ⁴ | 29,660 |
| 3. -0.0883 | -8.83×10^{-2} | 13. 8.8857 x 10 ⁴ | 88,857 |
| 4. 0.000019 | 1.9×10^{-5} | 14. 4 x 10 ² | 400 |
| 5. 16,000,000 | 1.6×10^7 | 15. -3.1 x 10 ⁻³ | -0.0031 |
| 6. 77 | 7.7×10^1 | 16. 6.003 x 10 ⁻⁵ | 0.00006003 |
| 7. -2130 | -2.130×10^3 | 17. -1.704 x 10 ³ | -1,704 |
| 8. 5507 | 5.507×10^3 | 18. 9 x 10 ¹ | 90 |
| 9. 0.0074300 | 7.43×10^{-3} | 19. 4.0607 ⁵ | 406,070 |
| 10. 0220.0110 | 2.20011×10^2 | 20. -5 x 10 ⁶ | -5,000,000 |

Operations With Scientific Notation

Simplify. Write each answer in scientific notation.

1) $(1.08 \times 10^{-3})(9.3 \times 10^{-3})$

2) $(2 \times 10^{-4})(8.1 \times 10^{-1})$

1.004×10^{-5}

1.62×10^{-4}

3) $(2.32 \times 10^{-6})(4 \times 10^{-5})$

4) $(3.48 \times 10^3)(9.8 \times 10^4)$

9.28×10^{-11}

3.41×10^8

5) $(7.1 \times 10^{-5})(6.7 \times 10^{-6})$

6) $(6 \times 10^3)(9.91 \times 10^0)$

4.757×10^{-10}

5.946×10^4

7) $\frac{7.1 \times 10^6}{8.2 \times 10^1}$

8) $\frac{5.4 \times 10^{-1}}{3.4 \times 10^1}$

8.659×10^4

1.588×10^{-2}

9) $\frac{4 \times 10^4}{3.63 \times 10^{-4}}$

10) $\frac{9 \times 10^{-5}}{9.24 \times 10^{-6}}$

1.102×10^8

9.74×10^0

11) $\frac{8.42 \times 10^3}{5 \times 10^2}$

12) $\frac{8.9 \times 10^6}{8.4 \times 10^6}$

1.684×10^1

1.06×10^0

13) $(8.9 \times 10^5)^4$

14) $(4 \times 10^{-5})^{-6}$

6.274×10^{23}

2.441×10^{26}