Scientific Notation

MAT0024 BASIC ALGEBRA

Scientific Notation: Writing a very large or very small number in a more compact way using powers of ten.

EXAMPLE: $93{,}000{,}000 = 9.3 \times 10^7$

A number between 1 and 10 times a power of 10.

The exponent, 7, on the base, 10, indicates that 9.3 has to be **multiplied** by 10 seven times; in other words, the decimal point has to be moved seven places the **right**.

EXAMPLE: $0.00000093 = 9.3 \times 10^{-7}$

The exponent, -7, on the base, 10, indicates that 9.3 has to be **divided** by 10 seven times; in other words, the decimal point has to be moved seven places the **left**.

Write the following in scientific notation:

1. 3000
2. 0.000346
3. 110,000,000
4. 0.0606
5. 1,200,000
6. 0.00583

Write each number in decimal form:

7. 3×10^2
8. 7.1×10^{-5}
9. 1.79×10^{-4}
10. 6.78×10^6
11. 2.14×10^8
12. 2.347×10^{-5}

Evaluate the following expressions using exponential rules. Write your answers without exponents.

13. $\dfrac{30 \times 10^5}{6 \times 10^3}$
14. $(2 \times 10^8)(3 \times 10^{-3})$
15. $\dfrac{1.2 \times 10^5}{0.6 \times 10^{-2}}$

ANSWER KEY

1) 3×10^3 2) 3.46×10^{-4} 3) 1.1×10^8 4) 6.06×10^{-2}
5) 1.2×10^6 6) 5.83×10^{-3} 7) 300 8) 0.000071
9) 0.000179 10) 6,780,000 11) 214,000,000 12) 0.00002347
13) $5 \times 10^2 = 500$ 14) $6 \times 10^5 = 600{,}000$ 15) $2 \times 10^7 = 20{,}000{,}000$