RULES OF EXPONENTS

Rule 1: To multiply identical bases, add the exponents.

\[ a^m \times a^n = a^{m+n} \]

Example: \(3^2 \times 3^4 = (3 \times 3) \times (3 \times 3 \times 3 \times 3) = 3 \times 3 \times 3 \times 3 \times 3 = 3^6\)

Rule 2: To divide identical bases, subtract the exponents.

\[ a^m : a^n = a^{m-n} \]

Example: \(3^4 : 3^2 = \frac{3^4}{3^2} = \frac{3 \times 3 \times 3 \times 3}{3 \times 3} = 3^{4-2} = 3^2\)

Rule 3: When you raise a base to two exponents, you multiply those exponents together.

\[(a^m)^n = a^{m \times n}\]

Example: \((3^4)^2 = (3^4) \times (3^4) = (3 \times 3 \times 3 \times 3) \times (3 \times 3 \times 3 \times 3) = 3^{4 \times 2} = 3^8\)

Rule 4: Except for 0, any base raised to the power of 0 equals 1.

\[a^0 = 1\]

Example: \(3^0 = 1\)

Rule 5: Any number raised to the power of “one” equals itself.

\[a^1 = a\]

Example: \(3^1 = 3\)