

~Mr Mac's Math Notes~

Laws of Exponents

There is a set of rules for evaluating expressions involving integral exponents. These are known as exponent laws. There are 5 laws.

1. Product of Powers: $a^m \times a^n = a^{m+n}$

What this means is...if you are multiplying powers with the same base, just leave the base the same and add the exponents.

Example: $3^2 \times 3^4 = 3^6$

2. Quotient of Powers: $a^m \div a^n = a^{m-n}$

What this means is...if you are dividing powers with the same base, just leave the base the same and subtract the exponents.

Example: $3^8 \div 3^2 = 3^6$

3. Power of a Power: $(a^m)^n = a^{m \times n}$

What this means is...if you are raising a power to another power, just leave the base the same and multiply the exponents.

Example: $(3^4)^2 = 3^8$

4. Power of a Product: $(ab)^m = a^m b^m$

What this means is...if you are raising a multiplication statement (a product) to a power, you can raise each base in the statement to the power individually.

Example: $(3 \times 4)^3 = 3^3 \times 4^3$

5. Power of a Quotient: $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

What this means is...if you are raising a fraction (a quotient or division problem) to a power, you can raise each base in the statement to the power individually.

Example: $\left(\frac{2}{3}\right)^3 = \frac{2^3}{3^3}$