

1. Logarithmic Identities:

Logarithmic identities are useful relationships between logarithmic expressions. Some common identities include:

Product Rule: $\log_b(xy) = \log_b x + \log_b y$

Quotient Rule:

$\log_b\left(\frac{x}{y}\right) = \log_b x - \log_b y$

Power Rule:

$\log_b(x^r) = r \log_b x$

2. Change of Base Formula:

The change of base formula allows for the conversion of logarithms from one base to another. It is expressed as:

$\log_b x = \frac{\log_a x}{\log_a b}$

Exponential Equations and Logarithmic Equations

1. Solving Exponential Equations:

Exponential equations involve variables in the exponent.

To solve exponential equations, take the logarithm of both sides to isolate the variable.

2. Solving Logarithmic Equations:

Logarithmic equations involve logarithmic expressions.

To solve logarithmic equations, use logarithmic properties to simplify the equation and isolate the variable.

Applications

1. Compound Interest:

Logarithms are used to solve problems involving compound interest, where the amount of interest earned depends on the initial investment, interest rate, and time period.