Section 5.3 Properties of Logarithms

# Objective 1: Using the Product Rule, Quotient Rule, and Power Rule for Logarithms

Let , *u* and *v* represent positive numbers, and *r* be any real number.

1. The Product Rule for Logarithms is .
2. The Quotient Rule for Logarithms is .
3. The Power Rule for Logarithms is .











# Objective 2: Expanding and Condensing Logarithmic Expressions

When expanding and condensing logarithmic expressions be sure to look for resulting logarithms that can be evaluated or simplified.

# Objective 3: Solving Logarithmic Equations Using the Logarithm Property of Equality

**The Logarithm Property of Equality:** If a logarithmic equation can be written in the form, then. Furthermore, if, then .

# Objective 4: Using the Change of Base Formula

**Change of Base Formula**: For any positive base and for any positive real number *u*, then  where *a* is any positive number such that .