Variables Example

A variable is a symbol for a number that may be unknown or may change. Algebra uses variables to express a rule once and apply it to many values, which is useful in science, measurement, and everyday calculations. Algebra was developed over many centuries rather than invented by one person: al-Khwarizmi systematized equation methods, and François Viète later advanced letter-based symbolic algebra. This example substitutes known values and evaluates the expression using order of operations.

Worked example

Evaluate 3x + 2y when x = 4 and y = 5.

FORMULA / RULE USED

Expression: 3x + 2y; substitution rule: replace x by 4 and y by 5.

Step-by-step solution

STEP 1 · Substitute the given values

Replace each variable wherever it appears.

$$3x + 2y = 3(4) + 2(5)$$

STEP 2 · Multiply before adding

Follow the order of operations and evaluate both products first.

$$3(4) + 2(5) = 12 + 10$$

STEP 3 · Add the terms

Combine the evaluated terms.

$$12 + 10 = 22$$

Answer

ANSWER

The value of 3x + 2y is 22.

Check

The first term is 3x = 12 and the second is 2y = 10; their sum is 22.

$$3(4) + 2(5) = 12 + 10 = 22$$