MATHEMATICAL LANGUAGE AND SYMBOLS:

Variable

Variables

It is represented by a letter, like x or y.

$$ax^2 + bx + c$$

Variables

A symbol for a value we don't know yet.

$$ax^2 + bx + c$$

example

Is there a **number** with the following property:

Doubling it and adding 3 gives the same result as squaring it?

Is there a **number** ▮ with the property that $2▮+ 3 = ▮^2$?

To illustrate the second use of variables, consider the statement:

No matter what number might be chosen, if it is greater than **2**, then its square is greater than **4**.

Introducing a variable to give a temporary name to the number that you might choose enables you to maintain the generality of the statement.

Is there a **number** x with the property that $2x + 3 = x^2$?

No matter what number might be chosen, if it is greater than 2, then its square is greater than 4.

No matter what number might be chosen, if x greater than 2, then x^2 is greater than 4.

Writing Sentence Using Variable

Use variables to rewrite the following sentences more formally.

a. Are there numbers with the property that the sum of their squares equals the square of their sum?

b. Give any real number, its square is nonnegative.

Writing Sentence Using Variable

a. Are there numbers with the property that the sum of their squares equals the square of their sum?

Writing Sentence Using Variable

    b. Give any real number, its square is nonnegative.

Some Important Kinds of Mathematical Statements

Universal Statement

Says that a certain property is true for all elements in a set. "For all, For each, For every"

Some Important Kinds of Mathematical Statements

Conditional Statement

Says if one thing is true then some other thing also has to be true. "If-then"

Some Important Kinds of Mathematical Statements

Existential Statement

Says that there is at least one thing for which the property is true.

Universal Conditional Statement

A Statement that is both universal and conditional.

Universal Existential Statements

A statement that is universal because its first part says that a certain property is true for all objects of a given type, and it is existential because its second part asserts the existence of something.

Existential Universal Statements

A statement that is existential because its first part asserts that a certain object exists and is universal because its second part says that the object satisfies a certain property for all things of a certain kind.