

Unit 1: Program Basics

Skill Builder 2: Arguments and Expressions

In this second lesson for Unit 1, you will learn about sending arguments into a program and displaying results of expressions.

**Objectives:**

- Use arguments in a program
- Use expressions in **Disp** statements

**Why does a program name have parentheses?**

The parentheses after a program name are always required, and they allow a program to accept *arguments* or *initial values*. There are two forms of arguments: the *formal* arguments which are always variables within the parentheses when viewing the Program Editor and the *actual* arguments which are values, defined variables, or expressions that are entered into the parentheses when running the program on the Calculator app.

Define **hypotenuse(a, b)**

*a* and *b* are formal arguments (or parameters) that will receive values when the program runs.

**Teacher Tip:** Arguments are also called ‘parameters.’ The letters *a* and *b* in the code above are called ‘formal parameters.’ They are place holders used to perform computations within the program. When the program runs, it will receive the values of the ‘actual parameters’ from the command line, and the variables *a* and *b* will contain those values.

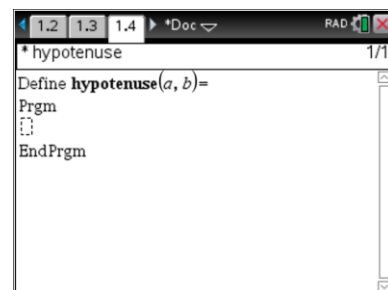
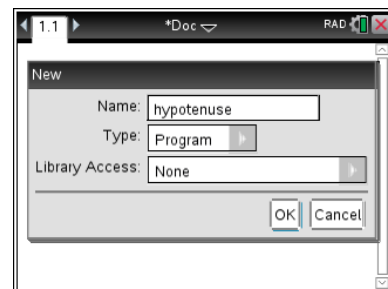
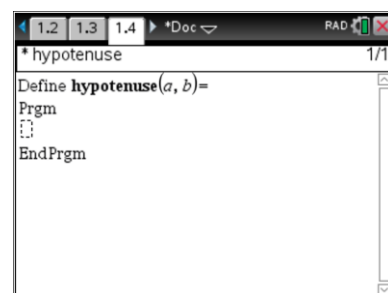
Let’s write a program that uses arguments to compute the length of the hypotenuse of a right triangle.

1. If you are continuing work in a document, you can insert a page by pressing **ctrl+doc**, and selecting **Add Program Editor > New....**

Alternatively, start a new document by pressing , and selecting **New Document**. Select **Add Program Editor > New....**

2. Name the program **hypotenuse**, and select **OK** or press **enter**.
3. In the Program Editor, press the up arrow to move inside the parentheses after the program name. Type the formal arguments **a, b** (note the comma) inside the parentheses. Then, move the cursor into the **Prgm...EndPrgm** block by pressing the down arrow.

**Teacher Tip:** If the arguments *a* and *b* are not included in the parentheses after the program name, an error will occur when running the **hypotenuse** program described below.



## The Code

In this program, one statement is used to display the value of the hypotenuse of a right triangle whose leg lengths are the arguments to the program.

4. Enter **Disp**  $\sqrt{a^2 + b^2}$  by selecting **menu > I/O > Disp** and then typing the expression.
5. 'Check Syntax & Store' the program by selecting **menu > Check Syntax & Store > Check Syntax & Store** (or use the shortcut **ctrl+B**).

## Run the Program

6. Press **ctrl+R** to prepare to run the program. *Before pressing enter*, type two values separated by a comma inside the parentheses provided. These values are used by the arguments *a* and *b* in the program. Then press **enter**. Be sure to use values for which you know the answer to test that the program is working properly.

You can also use expressions in place of numbers, such as:

**hypotenuse(2\*7, 9-5)**

7. To run the program again, press **var**, and select the program name. Type two values, and press **enter**. Alternatively, arrow up to highlight the program name and the values in parentheses, press **enter** to paste to the command line, edit the values in the parentheses, and press **enter** to run the program.
8. Test your program thoroughly with various values as arguments. Do any values cause errors?
9. Save your document by pressing **ctrl+S**.

**Teacher Tip:** When typing the program name in the Calculator app, the font changes from *italic* to **bold** indicating that the characters are the name of a variable. When a left parenthesis is typed, the right parenthesis is added automatically. Program names can also be selected from the var key.

When pressing **ctrl+S** to save the document, a dialog box will not appear if the document has been saved before. If the document has not been saved, a 'Save As...' dialog box appears.

