

EXAMPLE 1A [See Note 1]

1. Program Description: This program will compute the area of a triangle, given the three sides.

2. Analysis:

(a) Inputs:

There are three inputs: the lengths of the three sides.

(b) Outputs:

There is one output, the area.

(c) How to obtain the outputs:

We will use [Heron's Formula](#) (see part (d) below).

(d) Mathematical Formulas:

Let a, b, and c be the lengths of the sides. There are two steps in the computation:

Set  $s = (a + b + c)/2$  [This is an intermediate result; it is neither an input nor an output.]

Set  $\text{Area} = \text{Sqrt}(s*(s - a)*(s - b)*(s - c))$  [This will be the output] [See Note 2]

(e) Variables table:

Name	Data Type	Usage
a	Float	Length of first side
b	Float	Length of second side
c	Float	Length of third side
s	Float	The intermediate result used in Heron's formula
Area	Float	The area computed

3. Some Test Cases:

a	b	c	Area
3	4	5	6
5	5	0	0
5	5	5	10.82531755.....

4. Pseudocode

Begin program

Declare Float a, b, c, s, Area

```
// Ask for, and accept, the lengths of the three sides
Print "Please enter the first side"
Input a
Print "Please enter the second side"
Input b
Print "Please enter the third side"
Input c

// Do the computations per Heron's Formula
Set s = (a + b + c)/2
Set Area = Sqrt(s*(s - a)*(s - b)*(s - c))

//Show the result

Print "The Area is " + Area
End program
```

Note 1: This example differs from Example1 in that it has three inputs instead of one, and does a different calculation. Assignment 1 differs from this example in that there are even more inputs, and another different calculation.

Note 2: Sqrt refers to finding the square root of a number. The square root of a number  $x$  is a number  $y$  such that  $y*y=x$ . For example, the square root of 9 is 3, because  $3*3 = 9$ . Nearly every programming language includes a tool for finding square roots, and it is almost always called Sqrt.