



Explanation

Your program seems to work—you have output. But, how do you know the answer is correct? Start testing with data where the answers are easy to verify.

Ontario Curriculum Expectations

Computer Science

ICS20 (grade 10):

B3.4 demonstrate the ability to validate a computer program using test cases.

ICS 3U (grade 11 university prep):

A4.5 demonstrate the ability to validate a program using a full range of test cases.

B4.4 use a test plan to test programs (i.e., identify test scenarios, identify suitable input data, calculate expected outcomes, record actual outcomes, and conclude ‘pass’ or ‘fail’) by comparing expected to actual outcomes.

B4.5 use a variety of methods to debug programs (*e.g., manual code tracing, extra code to output the state of variables*).

ICS3C (grade 11 college prep):

A3.5 demonstrate the ability to validate a program using test cases.

B4.4 use a test plan to test programs (i.e. identify test scenarios, identify suitable input data, calculate expected outcomes, record actual outcomes, and conclude ‘pass’ or ‘fail’) by comparing expected to actual outcomes.

B4.5 use a variety of methods to debug programs (*e.g., manual code tracing, extra code to output the state of variables*).

ICS4U (grade 12 university prep):

A4.2 develop and implement a formal testing plan (*e.g., unit testing, integration testing, regression testing*) for a software project to ensure program correctness.

ICS4C (grade 12 college prep):

A4.3 develop and implement a formal testing plan for a software development project to ensure program correctness.

Computer Technology

TEJ2O (grade 10)

B5.4 use a design process to plan, write, and test a computer program to control a simple robot or peripheral device (*e.g., servo motor, LED display*).

Sample Follow-up Exercises

ICS20/TEJ20

Write a program that finds the hypotenuse of any right triangle, given the length of the opposite and adjacent sides.

Test Data

Side 1	Side 2	Output
3	4	5
5	12	13
1	1	1.4142

ICS3C/U

Write a program that allows the user to enter the length of three sides of a triangle. Determine:

- the validity of the user entries;
- whether a triangle can be formed from the lengths entered;
- the area and interior angles.

Test Data

Side 1	Side 2	Side 3	Output
3	4	5	Right triangle
5	12	13	Right triangle
-7	6	9.2	Invalid side length
7	-6	9.2	Invalid side length
7	6	-9.2	Invalid side length
6	4	12	Does not form triangle
5	12	20	Does not form triangle

ICS4U

Write a program that allows the user to enter the length of three sides of a triangle. Determine:

- the validity of the user entries;
- whether a triangle can be formed from the lengths entered;
- the area and interior angles.

Complete the chart below prior to writing your program.

Test Data

Side 1	Side 2	Side 3	Output
3	4	5	
6	4	12	
-7	6	9.2	
5	5	5	
6	8	5	
12	6	9	

ICS4C

Create a graphical user interface form to allow a user to enter three sides of a triangle. Determine:

- the validity of the user entries;
- whether a triangle can be formed from the lengths entered;
- whether the sides form a right triangle.

Test Data

Side 1	Side 2	Side 3	Output
3	4	5	Right triangle
5	12	13	Right triangle
-7	6	9.2	Invalid side length
7	-6	9.2	Invalid side length
7	6	-9.2	Invalid side length
6	4	12	Does not form triangle
5	12	20	Does not form triangle