**Part 1: C# (30 points)**

(10 points) Write a C# program that calculates the area of a triangle given its base and height. Include user input for both values and display the calculated area.

**Answer:**

using System;

class Program

{

static void Main()

{

Console.WriteLine("Enter the base of the triangle:");

double baseLength = double.Parse(Console.ReadLine());

Console.WriteLine("Enter the height of the triangle:");

double height = double.Parse(Console.ReadLine());

double area = CalculateTriangleArea(baseLength, height);

Console.WriteLine("The area of the triangle is: " + area);

}

static double CalculateTriangleArea(double baseLength, double height)

{

return 0.5 \* baseLength \* height;

}

}

**(10 points) Declare an array of 5 integers and fill it with values based on a user-defined formula (e.g., n^2). Then, print the largest element in the array.**

**Answer:**

using System;

class Program

{

static void Main()

{

int[] array = new int[5];

for (int i = 0; i < array.Length; i++)

{

array[i] = (i + 1) \* (i + 1); // n^2 formula

}

Console.WriteLine("Array elements:");

foreach (int num in array)

{

Console.WriteLine(num);

}

int max = array[0];

for (int i = 1; i < array.Length; i++)

{

if (array[i] > max)

{

max = array[i];

}

}

Console.WriteLine("The largest element in the array is: " + max);

}

}

**(10 points) Implement a simple for loop that iterates from 1 to 10 and prints each number along with its square root.**

**Answer:**

using System;

class Program

{

static void Main()

{

Console.WriteLine("Number\tSquare Root");

for (int i = 1; i <= 10; i++)

{

double squareRoot = Math.Sqrt(i);

Console.WriteLine($"{i}\t{squareRoot}");

}

}

}