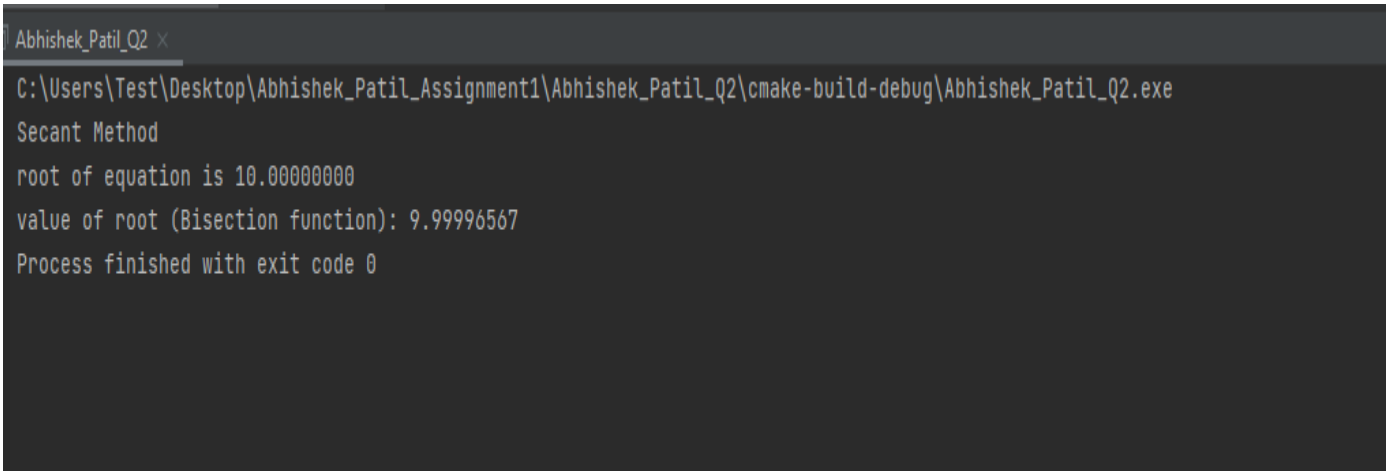
Explanation:

Q.2) As part of the bisection method, we must choose a lower bound and an upper bound, which can be accomplished by selecting a random number for both the lower bound and the upper bound.

We need to get closer to the source of the problem by finding a solution that is estimated to be close to zero. It is necessary to obtain the mid-point of the program at each iteration and to find the solution to the problem. We have an equation for which we need to find the roots



Q.3) To find the area of an ellipse using the Monte Carlo method, we must first find the area of the quarter half of the ellipse. To do this, we must integrate until the quarter half of the ellipse by using Monte Carlo integration until the quarter half of the ellipse.

According to the ellipse equation given in problem 3, 16x2 + 25y2 = 81 is the answer. The value of x will be 2.25 in this case, and the value of y will be 1.80. As a result, the surface area should be 2.25 * 1.80 * 3.14. This is equal to 12.717, which is the correct area of an ellipse.

Using the Monte Carlo method, my program generated the following output - which is very close to the 12.717. If we reduce the tolerance error, we will be able to obtain answers that are even closer to 12.717.

Q.4) Considering that a cube has eight vertices, if we number each vertex from 1 to 8, let's assume that the vertexes adjacent to or one edge distance apart from vertex 1 are 2, 4, 6, and 2 are 1, 3, 7, and so forth. We can find a path to a diagonally opposite vertex by creating an array of adjacent neighbor vertex of a vertex and traversing that array. It is possible to reach the diagonally opposite vertex by selecting a random edge from each vertex.