# Original Optimization Problem:

s.t.

# Unconstrained Optimization Problem:

# Analytical Solution:

# Gradient Descent Solution of Unconstrained Optimization Problem:

|  |  |  |
| --- | --- | --- |
| **Table 1:**  Gradient Descent Initial Points, Corresponding Solutions, and Number of Iterations | | |
| Initial Point, | Solution, | # Iterations |
|  |  | 84 |
|  |  | 86 |
|  |  | 114 |

Chart, line chart

Description automatically generated

**Figure 1:** Gradient descent convergence of error vs. iteration number for initial guess

# Newton’s Algorithm Solution of Unconstrained Optimization Problem:

|  |  |  |
| --- | --- | --- |
| **Table 2:**  Newton’s Algorithm Initial Points, Corresponding Solutions, and Number of Iterations | | |
| Initial Point, | Solution, | # Iterations |
|  |  | 1 |
|  |  | 1 |
|  |  | 1 |

Chart, line chart

Description automatically generated

**Figure 2:** Newton’s algorithm convergence of error vs. iteration number for initial guess