

More Optimization

In this lesson, we will solve two more optimization problems focused on minimizing distance and time.

Example 1: Find the point on the parabola $y = \frac{1}{2}x^2$ that is closest to the point $(4, 1)$.

1) Label variables, identify constraints and objective:

2) Write the objective as a function of one variable:

3) Optimize the function:

Example 2: A person is at point A on the west side of a river, directly across from point B on the east side. The person wants to reach point D which is 8 km downriver from point B . The river is 4 km wide and straight. The person rows to point C between B and D , then runs the rest of the way to D . The person rows at 5 km/h and runs at 12 km/h. Assume the river current is negligible. Where should C be chosen to minimize the total time to reach D ?

1) Label variables, identify constraints and objective:

2) Objective as a function of one variable:

3) Optimize the function: