Tarea 5 - Métodos numéricos
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Problema 1

A lighthouse L is located on a small island 5 km north of a point A on a straight east-west shoreline. A cable is to be laid from L to point B on the shoreline 10 km east of A. The cable will be laid through the water in a straight line from L to a point C on the shoreline between A and B, and from there to B along the shoreline. (see Figure 1). The part of the cable lying in the water costs $5.000/km, and the part along the shoreline costs $3, 000/km. Where should C be chosen to minimize the total cost of the cable?

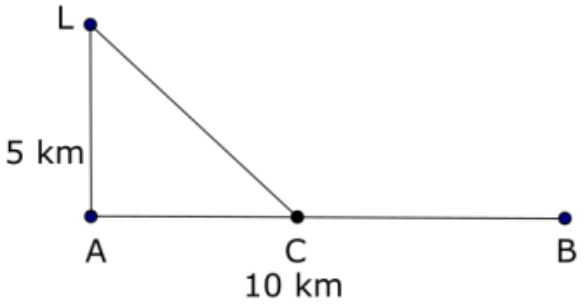

Figura 1: Problema 1

Problmea 2

Implement the following algorithms: Bisection, Newton, and Secant meth- ods for optimization in 1D.

Problmea 3

Problema 3a

Find the minimum value and minimum point of the function 1 on the interval [-1, 1] using the previous implemented algorithms. Compare the results in terms of number of iterations.

$$f(x) = -sin(x) + x^2 + 1 \tag{1}$$

Problema 3b

Compare and comment the results obtained for each algorithm on the interval [-1, 1] with function 2.

$$f(x) = sin(x) - x^2 + 1 \tag{2}$$