

Calculus Lab 6

1 November 2006

Work in pairs or individually, as you wish. When you are done, I would suggest printing out your work and/or emailing it to yourself. You may wish to refer to this stuff when doing later homework problems.

Goals:

- Further practice formulating and solving min-max optimization problems.
- Gain further experience using Maple to take derivatives and analyze functions.

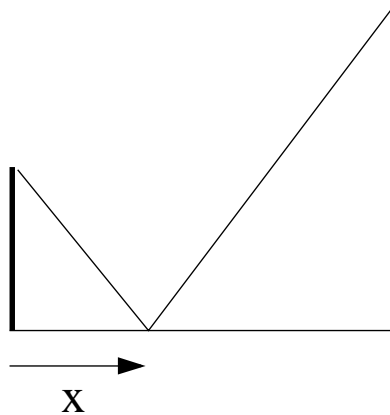


Figure 1: Two poles, each supported by a wire. The left pole is 4 meters tall and the right pole is 8 meters tall. The distance between the poles is 10 meters.

There are two tall poles that are positioned ten meters apart, as shown above. To help support these poles you attach a wire from the top of the pole to a stake in the ground. You only have one stake, however.

1. Where you should position the stake to as to minimize the amount of wire you use?
2. Ponder your result. Does it make sense? Are you sure you've found the minimum?
3. Now suppose that you want to position the wires so that the area made by the two triangles is maximized. Where should you put the stake to accomplish this?
4. Ponder your result. Does it make sense? Are you sure you've found the maximum?