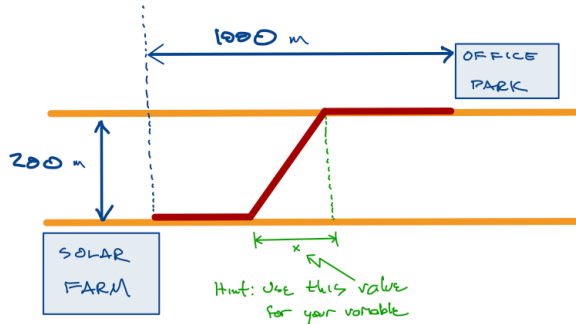


1. A utility company is planning to run a cable from a solar farm on one side of a river to an office park on the other side. It costs \$4 per meter to run the cable over land, while it costs \$5 per meter to run the cable under water. Suppose the river is 200 meters wide and the office park is 1000 meters downstream from the solar farm.



- (a) What is the most economical way to lay the cable?  
(b) How much will it cost?

2. The utility company still wants to run a cable from the solar farm to the office park as in #2, but due to river flooding becoming more unpredictable, they have adjusted the cost to lay the cable under water. It now costs \$6 per meter run cable under water but still \$4 per meter to run the cable over land.
  - (a) What is the most economical way to lay the cable in this scenario?  
Compare your answer to your answer in 3(a). Does this make sense?
  - (b) How much will it cost?
  
3. Trader Joes is designing a cylindrical can to hold 1 liter of chicken broth. Suppose the side costs 0.02 cents per square cm and the top and bottom cost 0.04 cents per square cm.
  - (a) What are the dimensions that will minimize the cost?
  - (b) How much will it cost?