

Team Project #3 - Return of the Couch

John A. Pelesko

April 26, 2004

The Conversation

“What are you doing now?” asked Diane, “I thought you moved the couch last week.”

“I did.” said Jack, “But, now I’m not sure if I put it in the right place or not. You see originally, I put the couch where the sum of the distances to the DVD player, the refrigerator, and the bathroom would be minimized. But, then today someone told me I should minimize the sum of the squares of the distances.”

“Who told you that? That doesn’t sound right.”

“This friend of mine who’s a grad student told me this. He looked at my calculations for the location of the couch and told me things would be much simpler if I did the sum of the squares rather than the sum of the distances.” said Jack.

“Yes, but do you get the same answer?” asked Diane.

“Hmmm, I didn’t think of that. I guess I should do the calculations before I move the couch.”

Questions for Discussion

- Obviously this problem is related to your exercise “Moving the Couch.” What new idea is being proposed here?
- Formulate the max/min problem for minimizing the sum of the distances, the sum of the distances squared, the weighted sum of the distances, and the weighted sum of the distances squared.
- What other measures might you use to decide the optimal placement of the couch?
- We’ve spent a lot of time on max/min problems this semester. Find an example of an interesting max/min problem involving functions of more than one variable. Solve it. This problem should be as realistic as possible, perhaps from your own experience. You’ll be judged on how interesting and difficult the problem is that you construct.

Your Task

Your job is to make a PowerPoint presentation on your answers to the questions raised by Jack and Diane. You might find the article below useful. This article also points to other

references that might help you solve the problems you pose. Presentations should be brought to class on a CD on May 17th. Note, your audience this time is your fellow Calculus III students. Your presentation should focus on *one* of the problems raised by Jack and Diane and the unique max/min problem your group constructs. You should insert slides outlining your solutions to the other problems raised by Jack and Diane, but these will be for my use only. As usual recall that you have Maple at your disposal. Maple allows you to visualize and even to animate. You should take advantage of this tool.

References

- [1] The College Mathematics Journal, "Optimal Locations", v. 23, 4 (1992).