

Project 4

due Thursday, October 2

Planning a Skating Party

This project is an extension of Unit 3.4, Planning a Skating Party, from the Moving Straight Ahead book (Grade 8) of the Connected Mathematics Project.

Problem 3.4 Suppose your class is planning a skating party to celebrate the end of the school year. Your committee is in charge of finding a place to rent in-line skates for a reasonable price. You get quotes from two companies:

Roll-Away Skates charges \$5 per person.

Wheelie's Skates and Stuff charges \$100 plus \$3 per person.

Which company should you choose if you want to keep the cost to a minimum? Explain how you made your choice.

- (a) Solve this problem. What piece of information is “missing”? What is the most *general* way of dealing with this missing piece of information?

Problem 3.4 Follow-Up

- 1.a. For each company, write an equation for the relationship between the number of people s and the cost c .
 - b. In the same window [on the same graph], graph the equations for both companies.
 - c. What range of values did you use for the number of people? For the rental cost? How did you select these ranges?
- 2.c. Find the intersection of the two graphs. What does this point mean in terms of the cost to rent skates?

- (b) Solve follow-up problems 1.a.–2.c. above. How could this help you solve part (a) above?

Call your cost at the intersection point the “cost of indifference.”

- (c) Solve follow-up problem 2.c. again, but instead of using the given price of \$5 per person for Roll-Away Skates, express the cost of indifference c_I as a function of a general parameter p_R for Roll-Away's price.

Graph this function, and show how the answer to the original version of follow-up problem 2.c. can be represented on this graph. Say why the function's behavior at the asymptotes makes sense.

- (d) Now represent **all** the numerical values in the original problem with general parameters. Then express the cost of indifference as a function of these parameters.

Show that the cost of indifference depends only on the *ratio* of the two prices, not the absolute prices themselves. How is the cost of indifference related to the overhead cost c_O (\$100 in the original problem) of Wheelie's?