

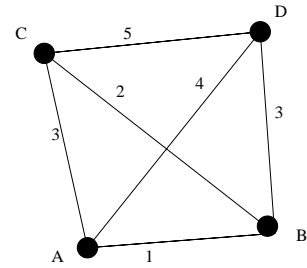
Name:

MATH 1001, Pop Quiz #2, Spring 2003

1. (3 Points) What is your section number?

Answers varied, of course! =)

The next few questions refer to the weighted graph shown to the right. Note that this is a complete graph with four vertices ( $K_4$ ). Each question is worth 3 points.



2. How many Hamilton Circuits are there in this graph?

$N = 4$ , and there are  $(N - 1)! = (4 - 1)! = 24$  circuits

3. How many of those would you have to check, using the Brute-Force Algorithm, to find the optimal circuit? (Don't make this harder than it is!)

All of them!

4. \_\_\_\_\_ True/False: The Brute Force Algorithm is an efficient way to find an optimal circuit for a complete graph, even if the graph has hundreds—or thousands!—of vertices.

False – this is precisely the problem with the Brute Force Algorithm.

5. Find a Hamilton Circuit using the Nearest-Neighbor Algorithm, beginning at the vertex  $A$ .

Starting at  $A$ , the nearest neighbor is  $B$ . Between the remaining vertices, the closest is  $C$ . At this point we don't have any choice; there is only one vertex remaining,  $D$ , and so we go there before heading home to  $A$ . The final circuit is  $A, B, C, D, A$ .