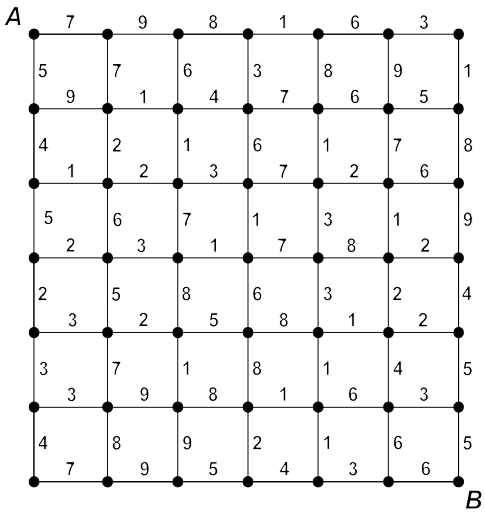
MATHEMATICS 3240
APPLIED GRAPH THEORY

If the grid on the right represents a network of roads and the numbers represent distances between intersections, what's the shortest route from *A* to *B*? Are you sure?



Suppose you are the operator of a snow plough. After a severe storm, you have to clear all the streets in the network shown. Can you plan a route which avoids travelling along a street you have already cleared? If not, what route minimizes the total distance you have to travel?

Consider the grid from a different viewpoint. Suppose there is a town at each intersection and the numbers represent the distances between towns. Your job is to pave the roads as economically as possible so that it is possible to travel between any two towns along pavement. What roads should be paved?

Graph theory is not like calculus or linear algebra, subjects you may have already studied. It is much less structured; there are far fewer to learn. But it is a rich subject with many applications at least some of which we hope will *standard techniques* intrigue you to the extent that you'll want to learn more about them.

Text. *Discrete Mathematics* by E. G. Goodaire and M. M. Parmenter has been used as a text for this course.

Marks. Typically 55% of the final grade in this course is awarded for performance on a final examination, 30% to performance on a midterm and 15% for homework.

Calendar description. **3240 Applied Graph Theory** examines algorithms and complexity, definitions and basic properties of graphs, Eulerian and Hamiltonian chains, shortest path problems, graph coloring, planarity, trees, network flows, with emphasis on applications including scheduling problems, tournaments, and facilities design.
Prerequisite: Mathematics 2320.
Note: Credit cannot be obtained for both Applied Mathematics/Pure Mathematics 3240 and Computer Science 2741.

Offered. Fall