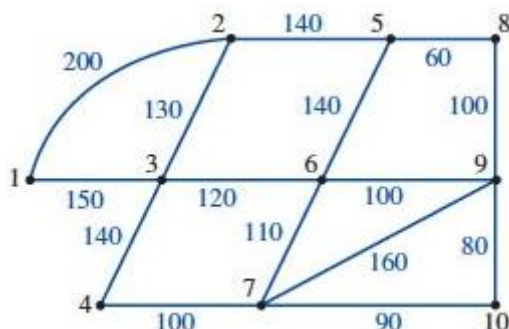


2019 MA3 Week 13 Investigation

Recyclable materials are to be collected from households in a part of a suburb. The network below represents this area, where the numbered dots are street intersections and the edges are the streets. The numbers indicate the lengths (in metres) of the streets between intersections.



- a) Does this network represent a planar graph? Explain your answer.

- b) Verify Euler's formula for this network.

- c) Represent the network as a matrix. (on the back of the sheet)

- d) The collectors wish to travel along each street once only to keep travel distance to a minimum. Determine this Euler trail.

- e) Is a Euler circuit possible for this network? If not, why not?

- f) The Transport Department has placed traffic density monitors at each intersection. Determine a route that a departmental officer could take in order to collect all the monitors without retracing a street. What would this path be called?

- g) A taxi driver wants to transport a customer from 1 to 10. Determine the shortest distance for him to travel between intersections 1 and 10.