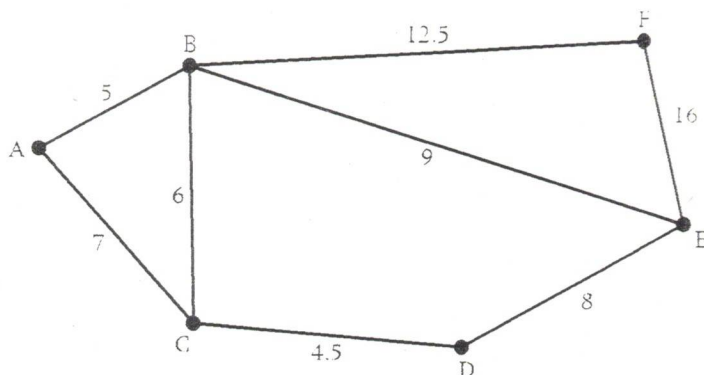


MIXED EXERCISE

1 A local council is responsible for gritting roads.

- (a) The following diagram shows the lengths of roads, in miles, that have to be gritted.



The gritter is based at A and must travel along all the roads, at least once, before returning to A.

- (i) Explain why it is **not** possible to start from A and, by travelling along each road only once, return to A.
- (ii) Find an optimal Chinese postman route around the network, starting and finishing at A. State the length of your route.
- (b) (i) The connected graph of the roads in the area run by another council has six odd vertices. Find the number of ways of pairing these odd vertices.
- (ii) For a connected graph with n odd vertices, find an expression for the number of ways of pairing these vertices. [A]

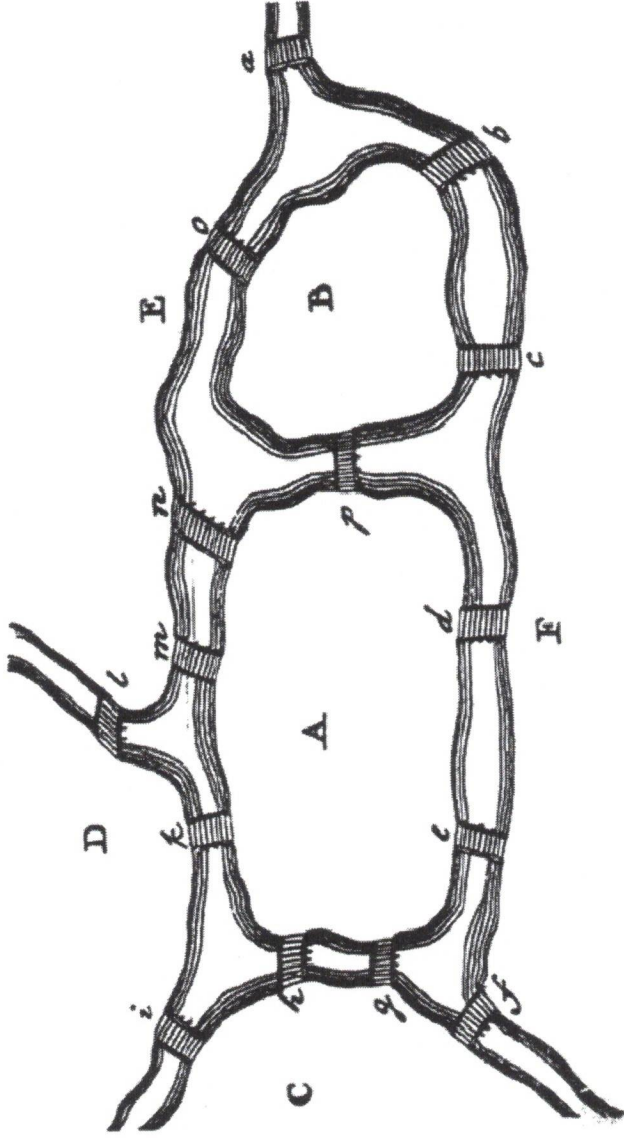


Figure 8. A more complicated example

Exercise: Draw the graph corresponding to the configuration above and use Euler's theorem to decide if there exists an open Euler trail or an Euler circuit in this case. Then use Fleury's algorithm to find an Euler trail.