

Problem:

Tom is distributing campaign literature. He needs to visit homes along the streets represented in the networks below.

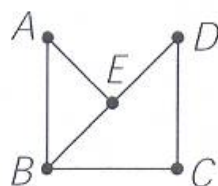
The capital letters represent intersections. Tom wants to find an efficient route that travels on each street.

He wants to travel only once on each street.

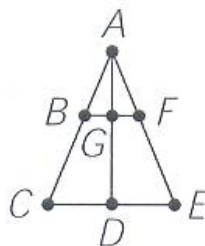
With these specifications in mind, determine if such a route is possible for each of the networks below.

If a route is possible, describe the route Tom could travel.

Be sure to list the letter of any intersection along the route.¹



Network 1



Network 2

Answers:

Network 1:

It is possible to find a route which travels each street only once.

Answers may include:

- B to E to A to B to C to D to E
- E to A to B to C to D to E to B

Network 2:

It is not possible to find a route which travels each street without retracing.

Teacher Note:

A **network** is a figure made up of points called vertices that are connected by segments called arcs. A **traversable network** can be drawn without lifting the pencil off the paper or by drawing any arc more than once. A network is **traversable** if it has at most 2 odd vertices. To determine if a vertex is odd or even, count the number of segments drawn out of the vertex.²

¹ Billstein, R. & Williamson, J. (1999). *Mathematics Book 2* Evanston, IL: McDougal Littell

² Billstein, R. & Williamson, J. (1999). *Mathematics Book 2* (p.449). Evanston, IL: McDougal Littell