



QUESTION WORKBOOK

Route inspection

Decision Mathematics 1 · Year FM

6 questions · 24 marks

PRINT EDITION

SECTION A · Warm-up

- A1** Explain why a network with odd nodes cannot be walked using every edge exactly once and returning to the start. [2]

- A2** The odd nodes of a network are A, B, D and E, with shortest paths AB 5, AD 9, AE 13, BD 7, BE 9, DE 9. List the three pairings with their costs. [3]

SECTION B · Standard

- B1** The nine edges of that network total 55. Find the length of the shortest closed route using every edge at least once, and name the repeated edges, given that the shortest D to E path runs through C. [4]

- B2** For the same network, find the shortest route that need not return to the start, and say where it begins and ends. [4]

- B3** Explain why the pairings use shortest paths between odd nodes rather than single edges, and why repeating an edge between two even nodes never helps. [3]

SECTION C · Stretch

- C1** A network has vertices A to F and edges AB 7, AC 5, AE 8, BC 4, BD 7, CD 6, CE 3, CF 10, DE 5, DF 8, EF 5. Find the length of the shortest closed route that traverses every edge at least once, and state which edges are repeated. [8]