InkMaths

QUESTION WORKBOOK

Graphs: order, Eulerian paths and planarity

Decision Mathematics 1 · Year FM

6 questions · 20 marks

PRINT EDITION

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SECTION A · Warm-up

A1 Explain why the number of odd nodes in any graph must be even. [2]

A2 A connected graph has nine edges and node orders 3, 3, 4, 3, 3 and 2. Verify the orders and classify the graph. [3]

SECTION B · Standard

B1 State how many edges the complete graphs K5 and K6 have, and explain which of them is Eulerian. [4]

B2 Describe the planarity algorithm and explain what it does when the graph is not planar. [4]

B3 Two graphs both have six nodes, nine edges and the same list of node orders. Explain why that does not prove they are isomorphic. [3]

SECTION C · Stretch

C1 A rectangular park has paths forming a network in which exactly two junctions have an odd number of paths. Explain what this means for a warden who must walk every path exactly once, and what changes if a further path is added between those two junctions. [4]