A Level · Edexcel · Further Maths

11 mins 1 question

The Travelling Salesman Problem

The Travelling Salesman Problem / Upper & Lower Bounds for the Travelling Salesman Problem / Solving the Travelling Salesman Problem

Scan here to return to the course
or visit savemyexams.com

Total Marks **/11**

1 (a) Explain clearly the difference between the classical travelling salesperson problem and the practical travelling salesperson problem.

(2 marks)

(b) Write your answer in the Answer Booklet.

	A	B	C	D	E	F	G
A	–	17	24	16	21	18	41
B	17	–	35	25	30	31	x
C	24	35	–	28	20	35	32
D	16	25	28	–	29	19	45
E	21	30	20	29	–	22	35
F	18	31	35	19	22	–	37
G	41	x	32	45	35	37	–

The table shows the least distances, in km, by road between seven towns, A, B, C, D, E, F and G. The least distance between B and G is x km, where $x > 25$

Preety needs to visit each town at least once, starting and finishing at A. She wishes to minimise the total distance she travels.

Starting by deleting B and all of its arcs, find a lower bound for Preety's route.

(3 marks)

(c) Write your answer in the Answer Booklet.

Pretty found the nearest neighbour routes from each of A and C. Given that the sum of the lengths of these routes is 331 km,

find x, making your method clear.

(4 marks)

(d) Write down the smallest interval that you can be confident contains the optimal length of Preety's route. Give your answer as an inequality.

(2 marks)