

4. A three-variable linear programming problem in x , y and z is to be solved. The objective is to maximise the profit P . The following initial tableau was obtained.

Basic variable	x	y	z	r	s	Value
r	2	0	4	1	0	80
s	1	4	2	0	1	160
P	-2	-8	-20	0	0	0

- (a) Taking the most negative number in the profit row to indicate the pivot column, perform one complete iteration of the simplex algorithm, to obtain tableau T . State the row operations that you use. (5)
- (b) Write down the profit equation shown in tableau T . (1)
- (c) State whether tableau T is optimal. Give a reason for your answer. (1)

(Total 7 marks)

5. (a) Explain why a network cannot have an odd number of vertices of odd degree.

(2)

Figure 4

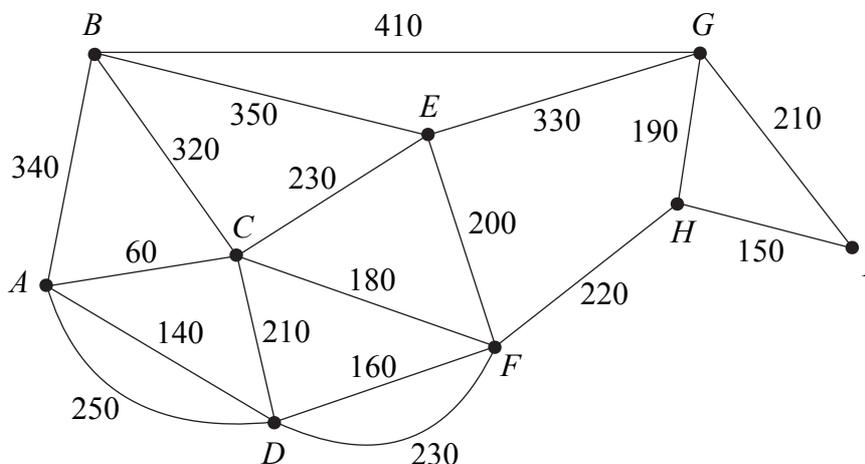


Figure 4 shows a network of paths in a public park. The number on each arc represents the length of that path in metres. Hamish needs to walk along each path at least once to check the paths for frost damage starting and finishing at *A*. He wishes to minimise the total distance he walks.

(b) Use the route inspection algorithm to find which paths, if any, need to be traversed twice.

(4)

(c) Find the length of Hamish's route.

[The total weight of the network in Figure 4 is 4180 m.]

(1)

(Total 7 marks)