

1. Three outlets A, B and C are supplied by three suppliers X, Y and Z. The table shows the cost, in pounds, of transporting each unit, the number of units required at each outlet and the number of units available at each supplier.
- a) Explain why it is necessary to add a dummy demand point in order to solve this problem.
- b) Add a dummy demand point and appropriate costs to the table.
- c) Use the north-west corner method to obtain an initial solution and also find the optimal solution by using MODI

	X	Y	Z	Supply
A	9	11	10	40
B	10	8	12	60
C	12	7	8	50
Demand	50	40	30	

2. A mining company extracts gravel, the basic product it sells, from three mines, L1, L2 and L3. The weekly production of each mine is 75, 150 and 75 tons of gravel respectively. The gravel has to be transported to five main consumers, K1, K2, K3, K4 and K5 requiring for their needs 100, 60, 40, 75 and 25 tons of gravel per week respectively.

The problem that concerns the company's management is the minimization of the required cost for the transportation of the product to the consumers. For this purpose a cost analysis was carried out which gave the results of the following table (the numbers denote the transportation cost in € per ton of gravel).

	K1	K2	K3	K4	K5
L1	3	2	3	4	1
L2	4	1	2	4	2
L3	1	0	5	3	2

Find the Optimum solution by using VAM