**UNIT 2 #7 LINEAR PROGRAMMING**

Michael wants to be a singer. Jordan wants to own his own record label.

To get closer to their dream jobs, Michael and Jordan decide to open a music shop and sell guitars and keyboards. They want to find out the maximum amount of money they may have to borrow to purchase new instruments. Each guitar will cost them $150 and each keyboard will cost $350.

a) Define the variables

b) Write the objective function for the amount of money they have to borrow to pay for the instruments.

c) Michael and Jordan have certain restrictions on the number of instruments they can purchase.

i) They can only purchase a maximum of 75 instruments.

ii) Because guitars are more popular than keyboards, they want to purchase twice the number of guitars than keyboards.

iii) To get started, they need at least 10 guitars and 7 keyboards.

 Write the constraints.

d) Graph the feasible region

e) Determine the vertices of the feasible region.

f) Determine the amount they need to borrow (check each vertex)

g) What is the maximum amount of money they need to borrow? What is the minimum amount of money they can borrow?

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| **Unit 2 #7 Linear Programming VOCABULARY** |
| OPTIMIZATION | The process of finding the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ value of some \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ quantity |
| OBJECTIVE FUNCTION | The function which is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to find the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ values |
| CONSTRAINTS | Linear \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which form the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| FEASIBLE REGION | The \_\_\_\_\_\_\_\_\_\_\_\_\_ of the system of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| VERTICES OF THE FEASIBLE REGION | Points of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lines |
| MAXIMUM VALUE OF OBJECTIVE FUNCTION | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ value of a \_\_\_\_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| MINIMUM VALUE OF OBJECTIVE FUNCITON | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ value of a \_\_\_\_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| LINEAR PROGRAMMING | The process of using an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ region |