Linear Programming: Applications

Finite Math

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Applications

Example

An electronics firm manufactures two types of personal computers–a desktop model and a laptop model. The production of a desktop requires a capital expenditure of $400 and 40 hours of labor. The production of a laptop requires a capital expenditure of $250 and 30 hours of labor. The firm has $20,000 capital and 2,160 labor-hours available for production of desktop and laptop computers.

(a) *What is the maximum number of computers the company is capable of producing?*

(b) *If each desktop contributes a profit of $320 and each laptop contributes a profit of $220, how much profit will the company make by producing the maximum number of computers?*

(c) *Does producing as many computers as possible produce the highest profit? If not, what is the highest profit and how many of each computer should be made in that case?*

Now You Try It!

Example

A fruit grower can use two types of fertilizer in his orange grove, brand A and brand B. The amounts (in pounds) of nitrogen, phosphoric acid, and chloride in a bag of each brand are given in the table. Tests indicate that the grove needs at least 1,000 pounds of phosphoric acid and at most 400 pounds of chloride.

	Brand A	Brand B
Nitrogen	8	3
Phosphoric Acid	4	4
Chloride	2	1

(a) *If the grower wants to maximize the amount of nitrogen added to the grove, how many bags of each mix should be used? How much nitrogen will be added?*

(b) *If the grower wants to minimize the amount of nitrogen added to the grove, how many bags of each mix should be used? How much nitrogen will be added?*

Answer

Solution

(a) 150 *bags brand A*, 100 *bags brand B*, 1,500 *lbs of nitrogen*

(b) 0 *bags brand A*, 250 *bags brand B*, 750 *lbs of nitrogen*