

## Homework 12

## Rock 'n' Rap



The Hits on a Shoestring music company is planning its next month's work. The company makes CDs of both rock and rap music.

It costs the company an average of \$15,000 to produce a rock CD and an average of \$12,000 to produce a rap CD. (The higher cost for rock comes from needing more instrumentalists for rock CDs.) Also, it takes about 18 hours to produce a rock CD and about 25 hours to produce a rap CD.

The company can afford to spend up to \$150,000 on production next month.

Also, according to its agreement with the employee union, the company will spend at least 175 hours on production.

Hits on a Shoestring earns \$20,000 in profit on each rock CD it produces and \$30,000 in profit on each rap CD it produces. But the company recently promised its distributor that it would not release more rap music than rock, because the distributor thinks the company is more closely associated with rock in the public mind.

The company needs to decide how many of each type of CD to make. *Note:* It can make a fraction of a CD next month and finish it the month after.

1. Graph the feasible region.
2.
  - a. Find at least three combinations of rock and rap CDs that would give the company a profit of \$120,000, and mark these points in one color on your graph. (The combinations do not have to be in the feasible region.)
  - b. In a different color, mark points on your graph that will earn \$240,000 in profits.
3. Find out how many CDs the company should make of each type next month to maximize its profit.
4. Explain how you found an answer to Question 3 and why you think your answer gives the maximum profit.