

$$\text{Rental price per sprayer} = \$69 - \text{Quantity of sprayers}$$

If Doral rents his sprayers using the above equation, he can rent all the sprayers that he leases. In other words, if Amos wants to rent 50 sprayers a week, he has to charge \$19 per sprayer per week. Using the above price-quantity relation and the previous cost information (\$27 weekly lease, \$2 cleaning cost, and \$65 per week for advertising and labor) AND assuming that all the sprayers he leases are rented each week, how many paint sprayers should Amos lease and what price should he charge?

### P 2-40: Fuller Aerosols

Fuller Aerosols manufactures six different aerosol can products (room deodorants, hair sprays, furniture polish, and so forth) on its fill line. The fill line mixes the ingredients, adds the propellant, fills and seals the cans, and packs the cans in cases in a continuous production process. These aerosol products are then sold to distributors. The following table summarizes the weekly operating data for each product.

Fuller Aerosols Weekly Operating Data

	AA143	AC747	CD887	FX881	HF324	KY662
Price/case	\$37	\$54	\$62	\$21	\$34	\$42
Fill time/case (minutes)	3	4	5	2	3	4
Fixed cost per product per week	\$900	\$240	\$560	\$600	\$1,800	\$600
Cases ordered per week	300	100	50	200	400	200
Variable cost/case	\$28	\$50	\$48	\$17	\$28	\$40

Each product has fixed costs that pertain only to that product. If the product is discontinued for the week, the product's fixed costs are not incurred that week.

Required:

- Calculate the break-even volume for each product.
- Suppose the aerosol fill line can operate only 70 hours per week. Which products should be manufactured?
- Suppose the aerosol fill line can operate only 50 hours per week. Which products should be manufactured?

### P 2-41: Happy Feet

*This is the case*

Dr. Lucy Zang, a noted local podiatrist, plans to open a retail shoe store specializing in hard-to-find footwear for people with feet problems such as bunions, flat feet, mallet toes, diabetic feet, and so forth. Because of the wide variety of foot ailments and shoe sizes needed, Dr. Zang estimates that she would have to stock a large inventory of shoes, perhaps as much as \$1.5 million (at her cost). She found a 4,000 square foot store in a popular mall that provides adequate retail space and storage for her inventory. Store improvements including carpeting, lighting, shelving, computer terminals, and so forth, require an additional \$0.2 million investment. Initial advertising, hiring expenses, legal fees, and working capital are projected to add another \$0.1 million of initial investment. To finance this \$1.8 million investment, Dr. Zang and her family will invest \$0.4 million and the balance of the \$1.4 million will be borrowed from a bank.

The mall charges rent of \$40 per square foot per year, payable in equal monthly installments, plus 3 percent of her retail sales. So, to rent the 4,000 foot store, the annual rent is \$160,000, or \$13,333 per month PLUS 3 percent of her sales. Besides the rent, Dr. Zang estimates other monthly expenses for labor, utilities, and so on to be \$38,000. These expenses will not vary with the amount of shoe sales. She plans to markup the shoes 100 percent, so a pair of shoes she buys wholesale for \$110 will be sold at retail for \$220. Based on her research, she expects monthly retail sales to be \$150,000, but in any given month total sales can be \$80,000 or \$220,000 with equal probability.

Dr. Zang talks to her local banker and lays out her business plan; the banker tells her the bank would make a three-year interest-only loan at 10 percent interest, with the principal of \$1.4 million due in three years (or it could be refinanced). The high interest rate of 10 percent was caused by the rather large risk of default due to the substantial fixed costs in the business plan. The banker explains that the monthly rent (\$13,333), other expenses (\$38,000), and interest (\$11,667), or \$63,000, require the shoe store to generate a fairly large minimum level of sales to pay these expenses.

Required:

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Happy Feet
- Calculate the amount of sales the Happy Feet store must do each month to break even.
  - After calculating the break-even point in part (a), Dr. Zang still believes that her Happy Feet store can be commercially successful and provide a valuable service to her patients. She goes back to the mall leasing agent and asks if the mall would take a lower fixed monthly rental amount and a larger percentage fee of her sales. The mall leasing agent (who happens to have sore feet and believes the Happy Feet store will drive new customers to his mall) says the mall would accept a rental fee of \$1,000 per month plus 12.5 percent of her monthly sales. While Dr. Zang likes the idea of dropping her monthly rent from \$13,333 to \$1,000, she feels that raising the percentage of sales from 3 percent to 12.5 percent is a bit steep. But she goes back to the bank and presents the revised rental agreement. The banker says the bank would lower the annual interest rate from 10 percent to 9 percent if Dr. Zang accepts the new lease agreement. Both the original lease and the new lease are for three years, and can be renegotiated at the end of the three years. Should Dr. Zang accept the new lease agreement (\$1,000 per month plus 12.5 percent) or the original lease terms (\$13,333 per month plus 3 percent)? Support your recommendation with both a written analysis and a quantitative analysis backing up your recommendation. (*Hint: First, conduct an analysis comparing the two options, using the expected monthly sales of \$150,000. Second, conduct an analysis comparing the two options, using the two extreme sales of \$80,000 and \$220,000.*)

## P2-42: Digital Convert

Digital Convert (DC) is a three-year-old start-up company with most of its capital coming from banks and personal investments by the founders. DC manufactures a high-resolution scanner (MXP35). At the heart of the MXP35 is a photoelectric light sensor that converts light into digital pixels. DC currently produces the MXP35 for \$480 (variable cost) per unit and incurs virtually no fixed manufacturing costs. All of its equipment is leased, and the leases are structured whereby DC only pays for the actual units produced. DC operates out of a building that is provided free by New York State for entrepreneurial start-ups. New York State also pays utilities, taxes, insurance, and administrative costs. DC does have fixed financing costs to service its existing loans, and these financing costs consume most of its profits from sales of the MXP35.

DC faces the following monthly demand schedule for the MXP35 (where price is the wholesale price DC receives):

Quantity	Price
19	\$1,278
20	1,240
21	1,202
22	1,164
23	1,126
24	1,088
25	1,050
26	1,012

(The equation of the demand curve for the above table is:  $P = \$2,000 - 38Q$ ). In other words, if DC wants to sell 20 MXP35s per month, it would charge a wholesale price of \$1,240 per unit.