

## 2-4 Fixed and Variable Expenses

### Exercises

1. The fixed expenses for producing widgets are \$947,900. The labor and materials required for each widget produced costs \$16.44. Represent the total expenses as a function of the quantity produced.
2. A widget manufacturer's expense equation is  $E = 14q + 29,000$ . What are the variable costs to produce one widget?
3. The Catania Cat Corporation manufactures litter boxes for cats. Their expense function is  $E = 4.18q + 82,000$ . Find the average cost of producing 10,000 litter boxes.
4. The expense function for a certain item is  $E = 2.95q + 712,000$ . Express the average cost of producing  $q$  items algebraically.
5. The Mizzi Corporation has created a demand function for one of its wrench sets. It expresses the quantity demanded in terms of the wholesale price  $p$ , and was found by surveying retailers and using linear regression. The demand function is  $q = -98p + 5,788$ . Their expense function is  $E = 23q + 68,000$ . Express the expense function as a function in terms of  $p$ .
6. A corporation's expense function is  $E = 7.50q + 34,000$ . The demand function was determined to be  $q = -5.5p + 6,000$ . Express the expense function in terms of the price.
7. Wexler's manufactures widgets. They create a monthly expense equation of all expenses in one month of manufacturing. The expense equation is  $E = 2.10q + 7,600$ . They plan to sell the widgets to retailers at a wholesale price of \$3.50 each.
  - a. How many widgets must be sold so that the income from the widgets is equal to the expenses of producing them? Round to the nearest widget.
  - b. If the company sells 2,900 widgets, how much money will they lose?
8. Find the break-even point for the expense equation  $E = 6.25q + 259,325$  and the revenue function  $R = 12q$ .