

Linear Models

1. A store is offering a 15% discount on all items.
 - a. Write a linear equation giving the sale price S for an item with a list price L .
 - b. Find the sale price of an item originally priced at \$39.

2. A manufacturer pays its assembly line workers \$11.50 per hour. In addition, workers receive a piecework rate of \$0.75 per unit produced.
 - a. Write a linear equation for the hourly wages W in terms of the number of units x produced per hour.
 - b. Find the wages of a worker who works a 40-hour week and produces 350 units.

3. A contractor purchases a piece of equipment for \$36,500. The operating cost is \$5.25 per hour for fuel and maintenance, and the operator is paid \$11.50 per hour.
 - a. Write an equation giving the cost C of operating the equipment for t hours. (Include the purchase cost.)
 - b. If customers are charged \$27 per hour, write an equation for the revenue R derived from t hours of use.
 - c. Write an equation for the profit P derived from t hours of use.
 - d. Use the result of part (c) to find the number of hours this equipment must be used to break even.

4. On a yardstick, you notice that 13 inches is the same length as 33 centimeters.
 - a. Use this information to find a mathematical model that related centimeters to inches.
 - b. Use the model to complete the table.

Inches	5	10	20	25	30
Centimeters					

5. An item that sells for \$145.99 has a sales tax of \$10.22.
 - a. Find a mathematical model that gives the amount of sales tax y in terms of the retail price x .
 - b. Use the model to find the sales tax on a purchase that has a retail price of \$540.50.