

1. Suppose that the demand equation for a certain model of electric can opener is  $D = -\frac{5}{4}p + 16$ . At \$2, seven can openers are supplied. If the supply equation is linear and the market price is \$4, find the supply equation.
2. A small business invests \$10,000 in equipment to produce a product. Each unit of the product costs \$0.65 to produce and is sold for \$1.20. How many items must be sold before the business breaks even?
3. A total of \$12,000 is invested in two corporate bonds that pay 7.5% and 9% simple interest. The investor wants an annual interest income of \$990 from the investments. Find the amount invested at each percentage rate.
4. Ten liters of a 30% acid solution is obtained by mixing a 20% acid solution with a 50% acid solution. How much of each solution is required to obtain the specified concentration in the final mixture?
5. Five hundred tickets were sold for one performance of a play. The tickets for adults and children sold for \$7.50 and \$4.00, respectively, and the total receipts for the performance were \$3312.50. How many of each kind of ticket were sold?

6. Find the equation of the line passing through the following points  $(5, -2)$  and  $(-8, 7)$ . Write it in **point-slope**, **slope-intercept** and **general form**.
7. Find the equation of a line **parallel** and **perpendicular** to the line in #6 and passing through the point  $(6, 9)$ . (any form)
8. As you drive home from the football game, the number of miles you are away from home depends on the number of minutes you have been driving. Assume that the distance varies linearly with time. Suppose that you are 11 mi from home when you have been driving for 10 minutes, and 8 mi from home when you have been driving for 15 minutes.
- Define variables for distance and time, and sketch the graph
  - Find the particular equation expressing distance in terms of time (distance as a function of time).
  - Predict your distance from home when you have been driving for 20, 25, and 30 minutes.
  - When were you 7 mi from home?
  - What does the time-intercept equal, and what does it represent in the real world?
  - In what domain does this linear function give you reasonable answers?
  - What are the units of the slope?  
What do you suppose the slope represents in the real world?  
What is the significance of the fact that the slope is negative?

