1.6 (More) Modeling with Functions

1. A river has risen 8 feet above its flood stage. The water begins to recede at a rate of 3 inches per hour.

    a) Write a mathematical model that shows the number of feet above flood stage after t hours.

    b) If the water continually recedes at this rate, when will the river be 1 foot above its flood stage?

2. Queen, Inc. a tennis racket manufacturer, determines that the annual cost C of making x rackets is $23 per racket plus $125,000 in fixed overhead costs. It costs the company $8 to string a racket. Queens, Inc. charges $56 for an unstrung racket and $79 for a strung racket.

    a) Find a function that models the cost of producing x unstrung rackets.

    b) Find a function that models the cost of producing x strung rackets.

    c) Find a function that models the revenue generated by selling x unstrung rackets.

    d) Find a function that models the revenue generated by selling x strung rackets.

⊞ Graphing Calculator

3. The data shows the percentage of the female populations in the United States employed in the civilian work force in certain years.

   a) Graph a scatter plot of the data where x is the number of years since 1955.

   b) Find a regression equation that models the data.

Year	Women (%)
1955	35.7
1960	37.7
1965	39.3
1970	43.3
1975	46.3
1980	51.5
1985	54.5
1990	57.5
1995	58.9
2000	60.2

4. The number of revenue passengers enplaned in the U.S. over the 14-year period from 1987 to 2000 is shown in the table below.

   a) Graph a scatter plot of the data where x is the number of years since 1987.

   b) Find a regression equation that models the data.

Year	Passengers (millions)
1987	447.7
1988	454.6
1989	453.7
1990	465.6
1991	452.3
1992	475.1
1993	488.5
1994	528.8
1995	547.8
1996	581.2
1997	599.1
1998	612.9
1999	636.0
2000	665.5