Section 1.1

19. A deposit is made into an interest-bearing account. Figure 1.11 shows the balance, $B$, in the account $t$ years later.

(a) What was the original deposit?
(b) Estimate $f(10)$ and interpret it.
(c) When does the balance reach $5000$?

\[ B(\$) \]
\[ \begin{array}{c|c|c|c|c|c} t \text{ (years)} & 5 & 10 & 15 & 20 & 25 \\ \hline B \text{ (\$)} & 2000 & 4000 & 6000 \\ \end{array} \]

Figure 1.11

(a) $\$1000$

(b) $f(10) \approx \$200$

This means in 10 years the total balance in the account will be approximately $\$200$.

(c) 20 years

Section 1.2

For problem 8, find the equation of the line that passes through the given points.

8. (4,5) and (2,-1)

\[ M = \text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 5}{2 - 4} = \frac{-6}{-2} = 3 \]

Now to find the equation of the line use the point-slope form.

\[ y - y_1 = m(x - x_1) \]

\[ y - 5 = 3(x - 4) \]

\[ y = 3x - 12 + 5 \]

\[ y = 3x - 7 \]
Section 1.2

14. A company rents cars at $40 a day and 15 cents a mile. Its competitor’s cars are $50 a day and 10 cents a mile.

(a) For each company, give a formula for the cost of renting a car for a day as a function of the distance traveled.

(b) On the same axes, graph both functions.

(c) How should you decide which company is cheaper?

\[ f(x) = 40 + 0.15x \]
\[ g(x) = 50 + 0.10x \]

(c) Decision should be based on the number of miles you intend to drive on one day.

Section 1.3

18. Table 1.13 gives the revenues, \( R \), of General Motors, the world’s largest auto manufacturer.\(^{25}\)

(a) Find the change in revenues between 1999 and 2004.

(b) Find the average rate of change in revenues between 1999 and 2004. Give units and interpret your answer.

(c) From 1999 to 2004, were there any one-year intervals during which the average rate of change was negative? If so, which?

Table 1.13 GM revenues, billions of dollars

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R )</td>
<td>176.6</td>
<td>183.3</td>
<td>177.3</td>
<td>177.3</td>
<td>185.5</td>
<td>193.0</td>
</tr>
</tbody>
</table>

(c) Yes, from 2000 to 2001 the average rate of change was
\[ \frac{183.3 - 177.3}{2000 - 2001} \text{ billion per year} \]
\[ = -6 \text{ billion per year}, \]

(a) Revenue in 1999 is 176.6 billion.

Revenue in 2004 is 193.0 billion.

Change in Revenue
\[ 193.0 - 176.6 = 16.4 \text{ billion} \]

(b) \[ \frac{16.4}{2004 - 1999} = \frac{16.4}{5} \text{ billion per year} \]
\[ = 3.28 \text{ billion per year} \]

The revenue has increased at an average rate of 3.28 billion per year from 1999 to 2004.