Homework Practice

Construct Functions

Solve.

1. **FUNDRAISING** The Pep Club rented a shaved ice machine to sell shaved ice as a fundraiser. They paid an initial fee and then an hourly charge. The table shows the cost per hour. Find and interpret the rate of change and initial value. Assume the relationship between the two quantities is linear.

<table>
<thead>
<tr>
<th>Number of Hours, $x$</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost ($)</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
</tr>
</tbody>
</table>

Cost = $5 per hour

2. **GARDENING** Simone planted a tomato plant and measured its height weekly. The total height at 2, 3, 4, and 5 weeks respectively were 13, 16, 19, and 22 inches tall. How tall was the tomato plant when Simone planted it? Assume the relationship is linear.

Rate = 3 in./wk.

3. **MOVIES** Marcus is a member of a theater club. He pays a monthly fee and his movie tickets are then $5 each. Find the monthly fee.

$y = 5x + 7.5$

4. **PHOTOS** The cost of having photos taken includes a sitting fee and $12 each for each portrait. The cost of 3, 6, and 9 photos respectively is $51, $87, and $123. What is the sitting fee?

$y = mx + b$

Cost = $12x +$sitting fee

-51 - 12(3) + $b$

$-36 = 3b + b$

$15 = b$

$m = 12 (3, 51)$

$y = 12x + 15$
Skills Practice

Construct Functions

1. When Charlotte planted her tomato plant, it grew 3 inches in one week. After 5 weeks, the tomato plant was 23 inches tall. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

\[
\begin{align*}
\text{rate:} & \quad \frac{3 \text{ inches per week}}{1 \text{ week}} \\
\text{initial value:} & \quad y = mx + b \\
23 & = (3)(5) + b \\
23 & = 15 + b \\
8 & = b
\end{align*}
\]

2. The total cost of renting a vacation home includes a deposit and a daily rental fee of $125. A family rents a vacation home for 5 days and pays $700. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

\[
\begin{align*}
\text{rate:} & \quad \frac{(5 \times \$700) - (5 \times \$125)}{5 - 0} \\
& = \frac{\$325}{5} \\
& = \$65 \text{ per day} \\
\text{initial value:} & \quad y = mx + b \\
700 & = (125)(5) + b \\
700 & = 625 + b \\
85 & = b
\end{align*}
\]

3. In order to enter the state fair, there is an admission cost. Each game is $3. Steven went to the state fair, played 4 games and spent a total of $20 on admission and games. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

\[
\begin{align*}
\text{rate:} & \quad \frac{$3 \text{ per game}}{1 \text{ game}} \\
\text{initial value:} & \quad y = mx + b \\
20 & = (3)(4) + b \\
20 & = 12 + b \\
8 & = b
\end{align*}
\]

4. After writing part of his novel, Thomas is now writing 16 pages per week. After 4 weeks, he has written 80 pages. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

\[
\begin{align*}
\text{rate:} & \quad \frac{16 \text{ pages per week}}{1 \text{ week}} \\
\text{initial value:} & \quad y = mx + b \\
80 & = (16)(4) + b \\
80 & = 64 + b \\
-16 & = b
\end{align*}
\]

5. A photographer charges $20 for an 8 x 10 photo plus a sitting fee. Lusma spent $65 on two 8 x 10 photographs and the sitting fee. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

\[
\begin{align*}
\text{rate:} & \quad \frac{$3 \text{ per game}}{1 \text{ game}} \\
\text{initial value:} & \quad y = mx + b \\
20 & = (3)(4) + b \\
20 & = 12 + b \\
-12 & = b
\end{align*}
\]

6. To perform car maintenance, a mechanic charges for parts and $45 an hour for labor. The total cost that Terri spent for 2 hour of car maintenance is $125. Assume the relationship is linear. Find and interpret the rate of change and the initial value.
## Problem-Solving Practice

**Construct Functions**

1. An education association wants to rent a cotton candy machine for a carnival. There is a one-time deposit of $40 plus an additional $8 per hour. The total cost to rent the machine for 5 hours is $115. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

   \[ y = 8x + 40 \]
   \[ \text{rate} = 8 \text{ per hour (5, 115)} \]
   \[ \text{I.V.} = 40 \]
   \[ 115 = 8(5) + b \]
   \[ b = 40 \]

2. Mr. Dodson is having the exterior of his house painted. The painters charge $35 per hour plus the cost of materials. After 20 hours of work, Mr. Dodson owes the painters $840. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

   \[ \text{rate} = 35 \text{ per hour}\]
   \[ (20, 840) \text{ I.V.} = 440 \text{ materials cost} \]
   \[ 840 = 20(35) + b \]
   \[ 840 = 700 + b \]
   \[ b = 140 \]

3. Before a movie began, a theater had 82 people waiting in the seats. During each of 4 movie trailers, 7 more people came into the theater. When the movie started 82 people were in the theater. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

   \[ \text{rate} = 7 \text{ per trailer (4, 82)} \]
   \[ 82 = 7(4) + b \]
   \[ b = -28 \]

4. The Art Club collected $15 from each of its 17 members for dues. It then had $300 in its account. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

   \[ \text{rate} = 15 \text{ per member}\]
   \[ 300 = 17(15) + b \]
   \[ b = -25 \]

5. The population of DeSoto rose an average of 142 people for each of 5 years. It then had 5,428 people. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

   \[ \text{rate} = 142 \text{ people per year (5, 5428)} \]
   \[ 5428 = 142(5) + b \]

6. Ling starts out with a certain number of baseball cards and plans to collect 8 each month. At the end of a year, he has 109 baseball cards. Assume the relationship is linear. Find and interpret the rate of change and the initial value.

   \[ \text{rate} = \# \text{ words} \]
   \[ \text{i.v.} = \# \text{ words} \]

---

**Functions**
P. 592 (9)
P. 594 (13 + 14)