Section 3.3 Exercises
(Pages 195-196)

#22)

An individual has $45,000 to invest: $32,000 will be put into a low-risk mutual fund averaging 6.2% interest compounded monthly, and the remainder will be invested in a high-yield bond fund averaging 9.3% interest compounded continuously.

1. Find the equation for the total amount of the two investments.
2. Give the rate-of-change equation for the combined amount.
3. How rapidly is the combined amount of the investments growing after 6 months? After 15 months?

#25)

The cumulative sales of iPods can be modeled by the function

\[ f(x) = 0.14 \cdot 4.106^x \] million units x years after 2002.

1. How long did it take Apple to sell 2.5 million iPods?
2. Write a formula for the rate at which iPods were selling x years after 2002.
3. How quickly were iPods selling at the time the 2.5 millionth iPod was sold?

#28)

The projected number of homes with access to the Internet via cable television can be modeled by the equation

\[ l(x) = -138.27 + 76.29 \ln(x) \] x years after 1990.

1. Give the rate-of-change formula for the projected number of such homes.
2. How many homes are projected to have Internet access via cable TV systems in 2024, and how rapidly is that number projected to be growing?
The percentage of households with TV that also have VCRs is shown in the table.

<table>
<thead>
<tr>
<th>Year</th>
<th>Households (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>68.6</td>
</tr>
<tr>
<td>1992</td>
<td>75.0</td>
</tr>
<tr>
<td>1994</td>
<td>79.0</td>
</tr>
<tr>
<td>1996</td>
<td>82.2</td>
</tr>
<tr>
<td>1998</td>
<td>84.6</td>
</tr>
<tr>
<td>2001</td>
<td>86.2</td>
</tr>
</tbody>
</table>

1. Align the input data as the number of years after 1987, and find a \( \text{log} \) model for the data.
2. Write the rate-of-change formula for the model in part (1).
3. According to the model, what was the percentage of households with TVs that also had VCRs in 2000? How rapidly was the percentage growing in that year?