

Name

7-4

Lesson Master

Questions on SPUR Objectives
See Student Edition pages 462–465 for objectives.

USES

Objectives D and E

In 1 and 2, use the table below, which gives the percentage of households in the U.S. with 7 or more persons in select years from 1790 to 1990.

Year	1790	1890	1900	1930	1940	1950	1960	1970	1980	1990
% Households with 7 or More Persons	35.8	23.0	20.4	10.9	9.3	4.9	5.4	5.1	2.2	1.4
Average Rate of Change										
Average Rate of Change of Average Rate of Change										

1. a. Find the average rate of change of the percentage of households with 7 or more persons between each pair of successive values in the table above. Place your answers in the third row of the table, under the latter of the two years.
- b. All but one of the rates of change in Part a should be negative. Identify the one positive value and explain what it means in the context of the situation.
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2. a. Calculate the average rate of change of each pair of consecutive rates of change you found in Question 1. Place your answers in the fourth row of the table, under the latter of the two rates.
- b. During which time periods was the percent of households with 7 or more persons accelerating? In which time periods was the percent decelerating?
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3. Suppose that the height $h(x)$ in meters of a cannonball x seconds after it is shot from a ground-level cannon is given by $h(x) = 950x - 4.9x^2$.
- a. Find a formula for the instantaneous velocity $v(x)$ of the cannonball x seconds after it is shot from the cannon.
- b. Find a formula for the instantaneous acceleration $a(x)$ of the cannonball x seconds after it is shot from the cannon.
- c. Find the height, instantaneous velocity, and instantaneous acceleration of the cannonball for each value of x .
- i. $x = 1$ ii. $x = 2.5$ iii. $x = 4$
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