

Name: _____

Grade: _____

Group Members Present:

_____, _____, & _____

1. The function $G(x)$ gives your expected grade on a test after x hours of studying. If you have studied for seven hours, your expected grade on the test is 88 and is increasing by 3.5 per hour.
 - a. Estimate the change in your grade if you study an extra 30 minutes (over seven hours).
 - b. Estimate your grade if you study for seven and a half hours.

2. Four seconds after it begins to move, a vehicle is traveling at a velocity of 73 feet per second. At that time, the vehicle's velocity is increasing by 14 feet per second per second.
 - a. Use $v(t)$ to represent the velocity of the vehicle after t seconds and $v'(t)$ to represent the acceleration of the vehicle after t seconds. Complete the following statements:
 $v(4) =$

 $v'(4) =$
 - b. Write a linearization of v with respect to t given the information above.
 - c. Estimate the velocity of the vehicle at $t = 4.5$. Interpret the result.

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3. Production costs for various hourly production levels of television sets are given in the table.

Hourly production (sets)	Production cost (dollars)
5	760
10	1080
15	1230
20	1350
25	1440
30	1600
35	1920

- a. Describe the behavior suggested by a scatter plot of the data.

- b. What type of model is suggested by the scatter plot.

- c. Write a model for the data set.

- d. Use the model to calculate the rate of change of production cost when 35 sets are made each hour.

- e. Write a linearization for production cost as a rate of change of hourly production when hourly production is 35 sets.

- f. Use the linearization to estimate production cost when 37 sets are produced each hour.