

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. A worker is reviewing his pay increases over the past several years. The table below shows the hourly wage W in dollars that he earned as a function of time t measured in years since the beginning of 1990:

Time t	1	2	3	4
Wage W	15.30	15.60	15.90	16.25

- (a) By calculating the ratios, show that the data in the table are exponential.
- (b) What is the yearly growth factor for the data?
- (c) The worker cannot remember the hourly wage that he earned at the beginning of 1990. Assuming that W is indeed an exponential function, determine what that hourly wage was.
- (d) Find a formula giving an exponential model for W as a function of t .
- (e) What percentage raise did the worker receive each year?

2. The following table shows national health care costs measured in billions of dollars:

Date	1960	1970	1980	1990	2000
Costs in Billions	27.6	75.1	254.9	717.3	1358.5

- (a) Plot the data. Does it appear that that they can be appropriately modeled by an exponential function?
- (b) Find an exponential function that approximates the data for health care costs.
- (c) By what percent per year were national health care costs increasing during the period from 1960 through 2000?
- (d) Use functional notation to express how much money was spent on health care in the year 2005, and then estimate that value.