Name: _____    Date: _____

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## Regression

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1. Students in Ms. Garth's Algebra II class wanted to see if there are correlations between test scores and time spent watching television. The students created a table in which they recorded 13 student's average number of hours per week spent watching television and scores on a test. Use the actual data collected by the students in Ms. Garth's class, as shown in the table below, to answer the following questions.

| TV hrs/week (average) | 30 | 12 | 30 | 20 | 10 | 20 | 15 | 12 | 15 | 11 | 16 | 20 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Scores | 60 | 80 | 65 | 85 | 100 | 78 | 75 | 95 | 75 | 90 | 90 | 80 | 75 |

  a) Find the best fitting linear model that represents the data and the correlations coefficient.

  b) Identify the y-intercept.  What does it represent in the context of the problem?

  c) Using this model, what is the estimated test score of a student who watches TV for 35 hours?

  d) Using this model, what is the highest number of hours a student can watch TV and still pass the test (make a 70)?

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2. The town planners designed a town for an optimal growth of 8% per year.  Below is a table representing the growth (in thousands) from 1997 to 2003.

| Year | Population |
|---|---|
| 1997 | 50 |
| 1998 | 54 |
| 1999 | 58 |
| 2000 | 63 |
| 2001 | 68 |
| 2002 | 73.5 |
| 2003 | 79.3 |

  a) Find the best fitting exponential model that represents the data and the correlation coefficient.

  b) Using this model, what is the predicted population in the year 2017?

  c) Using this model, what was the estimated population in 1977?

  d) In what year will the population have doubled?

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3. For the following data, decide if it would be best modelled with a linear, a quadratic, or an exponential function.  Find all three equations and explain your answer.

| x | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|
| y | 2 | 2 | 8 | 13 | 24 | 33 |

4. For the following data, decide if it would be best modelled with a linear, a quadratic, or an exponential function.  Find all three equations and explain your answer.

| x | 9 | 8 | 7 | 6 | 5 | 4 |
|---|---|---|---|---|---|---|
| y | 238 | 95 | 29 | 10 | 4 | 1 |

5. For the following data, decide if it would be best modelled with a linear, a quadratic, or an exponential function.  Find all three equations and explain your answer.

| x | 5 | 8 | 12 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|
| y | 14 | 19 | 45 | 53 | 61 | 61 |