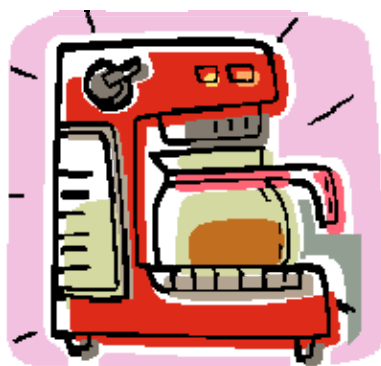


# LAB

Name \_\_\_\_\_

## Exponential Regression

**Data:** The data at the right shows the cooling temperatures of a freshly brewed cup of coffee after it is poured from the brewing pot into a serving cup. The brewing pot temperature is approximately 180° F.



Time (mins)	Temp ( ° F)
0	179.5
5	168.7
8	158.1
11	149.2
15	141.7
18	134.6
22	125.4
25	123.5
30	116.3
34	113.2
38	109.1
42	105.7
45	102.2
50	100.5

### Task:

a.) Determine an exponential regression model equation to represent this data. \_\_\_\_\_

b.) Graph the new equation.



c.) Is the new equation a "good fit" to represent this data? \_\_\_\_\_  
Explain how you made your decision. \_\_\_\_\_

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- d.) Based upon the new equation, what was the initial temperature of the coffee? \_\_\_\_\_
- e.) Interpolate data: When is the coffee at a temperature of 106 degrees?  
\_\_\_\_\_  
\_\_\_\_\_
- f.) Extrapolate data: What is the predicted temperature of the coffee after 1 hour? \_\_\_\_\_
- g.) In 1992, a woman sued McDonald's for serving coffee at a temperature of  $180^{\circ}$  that caused her to be severely burned when the coffee spilled. An expert witness at the trial testified that liquids at  $180^{\circ}$  will cause a full thickness burn to human skin in two to seven seconds. It was stated that had the coffee been served at  $155^{\circ}$ , the liquid would have cooled and avoided the serious burns. The woman was awarded over 2.7 million dollars. As a result of this famous case, many restaurants now serve coffee at a temperature around  $155^{\circ}$ . How long should restaurants wait (after pouring the coffee from the pot) before serving coffee, to ensure that the coffee is not hotter than  $155^{\circ}$ ? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- h.) If the temperature in the room is  $76^{\circ}$  F, what will happen to the temperature of the coffee, after being poured from the pot, over an extended period of time? \_\_\_\_\_  
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