

Lesson 6 Assignment Exponential Regression

Determine the exponential regression for the following set of data.

1. The infiltration rate of a soil is the number of inches of water per hour it can absorb. Hydrologists studied one particular soil and found its infiltration rate decreases exponentially as a rainfall continues.

Time, t (hours)	0	1.5	3	4.5	6
Infiltration Rate, I (inches per hour)	5.3	3.1	2.4	1.6	0.7

- a. Determine the exponential regression model for this data.
- b. Use the model to find the infiltration rate at 4 hours.
2. The population of Jamestown has been recorded for selected years since 2000. The table below gives these populations. Let $x = 0$ be the year 2000.

Year	2002	2004	2005	2007	2009
Population	5564	6121	6300	6812	7422

- a. Find the exponential regression model for this data.
- b. Predict the population for Jamestown in the year 2012.
3. The data in the table below 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 (min)	0	5	8	11	15	22	30	38
Temp ($^\circ\text{F}$)	179.5	168.7	158.1	149.2	141.7	125.4	116.3	109.1

- a. Determine the exponential regression model for this set of data.
- b. Predict the temperature of the coffee after 45 minutes.

See teacher for Answer Key