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Question 2

Records at the Center for Disease Control show that the total number of flu cases in Spring, 2009 looked like this:

Date	Day	Flu Cases
April 27	0	73
April 28	1	105
April 29	2	137
April 30	3	257
May 1	4	367
May 2	5	658
May 3	6	898

May 4	7	1,085
May 5	8	1,490
May 6	9	1,893

An initial examination of the data showed that both an exponential and a logistic growth model fit the data well:

Exponential Model	Logistic Growth Model
$a = 76.64$	$C = 3,273.31$
$b = 1.46$	$a = 43.59$
$R\text{-squared} = 0.984$	$b = 1.57$
	$R\text{-squared} = 0.996$

Use the data from the TABLE of Models to answer the following questions.

(1/1 point)

2a. Looking at the raw data, what is the rate of change in flu cases from April 30 to May 1? (*Report as a proportion rounded to 2 decimal places.*)

2 of 6 0.43

0.43

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(1/1 point)

2b. What is the growth rate for the flu, according to the exponential model? *(Report as a proportion rounded to 2 decimal places.)*

0.46

0.46

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(1 point possible)

2c. Predict the number of cases of flu on **Day 14** (when "Day" is equal to 14), using the exponential model. *(Round to zero decimal places.)*

15324

15324

Answer: 15325

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(1/1 point)

2d. Using the logistic model, predict the total number of flu cases on **Day 14**. (*Round to zero decimal places.*)

3034

3034

Answer: 3034

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(1/1 point)

2e. The actual number of flu cases on Day 14 was 4,379. Find the residual of the exponential model prediction. (*Round to zero decimal places.*)

-10946

-10946

Answer: -10946

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(1/1 point)

2f. What is the residual of the logistic model prediction for Day 14? (Round to zero decimal places.)

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(5/5 points)

Based on the residuals of both models, what conclusion would you reach? Fill in the missing blanks.

The better fit statistic of the logistic model suggests that the number of new flu cases will begin slowing down . Based on this model, we would expect the maximum number of flu cases in the 2009 season to be: 3,273 . However, neither model does a perfect job of predicting future cases by Day 14. We will need to observe how the data changes after day 9 to determine how the model needs to be adjusted.

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