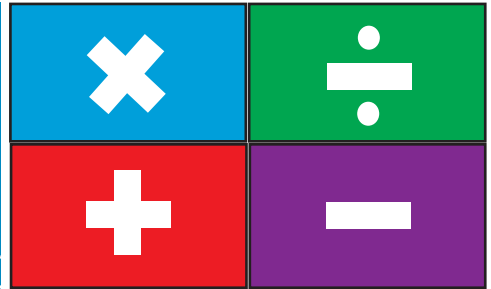# Math TODAY™
Student Edition
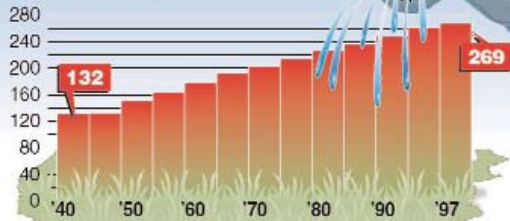
USA TODAY

NO. 1 IN THE USA

More of U.S.

USA SNAPSHOTS®

A look at statistics that shape the nation

More of U.S.

The nation began 1998 with an estimated population of 269 million, an increase of about 2.4 million in the past year. U.S. population growth (in millions):

Source: Census Bureau

By Cindy Hall and Marcy E. Mullins, USA TODAY

Focus Questions:

- Assume that the population of the United States is growing exponentially. What is the exponential function that best models the data provided?

- What is the projected population in this Snapshot for 1997? What is the percent error in the estimated population compared to the actual population?

- Determine when the U.S. population reached 100 million.

Activity Overview:

The USA TODAY Snapshot® "More of U.S." shows the population (in millions) of the United States from 1940 through 1997. You will use an exponential function to model the growth of the population over time. Population growth often is restricted while the exponential growth model is not restricted. However, the population data often behaves as an exponential function over a limited time period. You will use the model to make a prediction about the population for a known year and then compare this value with the actual population. Finally, you will be given a population and determine the year this population figure was attained.

More of U.S.

Procedure:

Activity 1: Assume that the population of the United States is growing exponentially. What is the exponential function that best models the data provided?

Step 1
Use the 1900-2000 data in the table below to create a scatterplot on the handheld. Let 0 represent 1900, 10 represent 1910, and so forth.

Year	0	10	20	30	40	50	60	70	80	90	100
Pop. U.S. (millions)	76	92	106	123	132	151	179	203	227	249	281

Step 2
Use the regression capabilities of the handheld to determine the exponential regression model for the data set.

Exponential regression model: _____

Activity 2: What is the projected population for 1997? What is the percent error in the estimated population compared to the actual population?

Step 1
Graph the scatterplot and the exponential regression model in the same window.

Step 2
Press TRACE ▼ (the cursor should be on the regression model) 9 7 ENTER

Projected population for 1997: _____

Step 3
Compare the projected population to the listed population in the Snapshot "More of U.S." for 1997. What is the percent error in your projected population?

_____

Activity 3: Determine when the U.S. population reached 100 million.

Step 1
Press Y= and enter 100 in an open register.

Step 2
Press GRAPH and use the capabilities of the handheld to find the intersection of these two graphs.

Data Source:

U.S. Census Bureau

Materials:

- TI-83 Plus family or TI-84 Plus family handheld

Additional Information:

U.S. Census Bureau

- www.census.gov

- www.census.gov/main/www/ popclock.html