

Transformation Graphing Application

Men's 200 m World Records from 1900-1996

Name	Year	Time (s)
Walter Tewksbury (U.S.A.)	1900	22.2
Archie Hahn (U.S.A.)	1904	21.6
Charles Paddock (U.S.A.)	1921	20.8
Roland Locke (U.S.A.)	1926	20.6
Jesse Owens (U.S.A.)	1935	20.3
Melvin Patton (U.S.A.)	1949	20.2
David Sime (U.S.A.)	1956	20.0
Pietro Minnea (Italy)	1979	19.72
Michael Johnson (U.S.A.)	1996	19.32

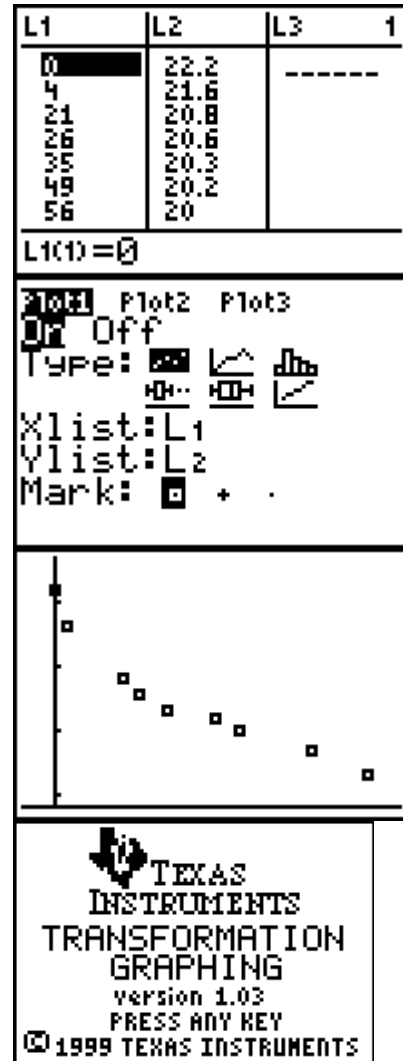
Instructions:

1. Enter the data for the 200 m World Records into the lists in your calculator by pressing STAT then hit **[ENTER]**. For the years, start at 0 and then enter the number of years since 1900 for each subsequent record (i.e. 1904 would be 4; 1921 would be 21; etc...).

2. Go to your STAT PLOTS and activate Plot1.

3. Select an appropriate viewing window and observe the graph of the data by pressing GRAPH. You may need to ZOOMSTAT (press ZOOM then 9) for better graphical representation.

4. Press the **APPS** key and select the **Transfrm** application. Hit **[ENTER]**. You should see this screen.



5. Press any key. The transformation graphing is running in the background. Press $\boxed{Y=}$ and enter the equation shown below in Y_1 .

6. Now return to your graph. You should see the following graph or a similar graph.

7. To change the value of one of the parameters, press $\boxed{\leftarrow}$ or $\boxed{\rightarrow}$. You can also type in the value. To move from parameter to another, press $\boxed{\uparrow}$ or $\boxed{\downarrow}$.

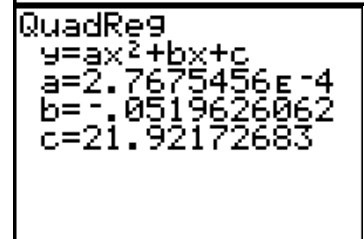
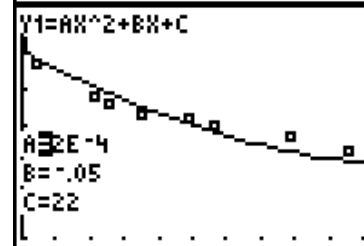
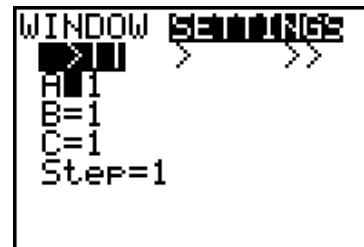
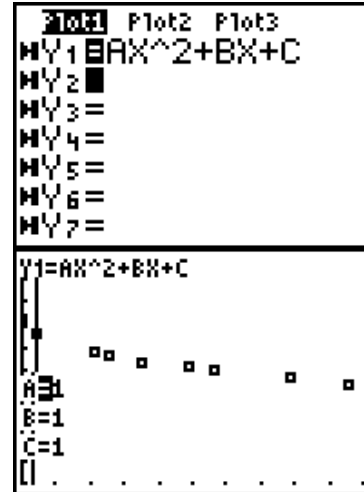
8. You can change the settings of the parameters (start values or step value) by pressing $\boxed{\text{WINDOW}}$ and press $\boxed{\uparrow}$ to get the SETTINGS menu. Change the start values or step values to whatever you think.

9. Once you think you have fit a curve to the given data note the values of a, b, and c.

10. Perform a quadratic regression. Press $\boxed{\text{STAT}}$, then $\boxed{\downarrow}$ to get the CALC menu. Select 5: QuadReg. The QuadReg command is pasted onto the home screen. Hit $\boxed{\text{ENTER}}$.

11. You can graph the regression equation given by the calculator by entering the values generated by your calculator for a, b, and c from step 10.

The transformation graphing application doesn't allow you to graph two or more functions, so you must uninstall the application by pressing APPS and selecting the Transfrm application. Select 1: Uninstall



12. Using your model and the regression model, what will the time be in 2004? in 2100? Return to your graph and press 2nd TRACE. Select 1: value. Try entering x=104 or x=200 to see if the y-value could be plausible.

