

Name _____ Period _____ Date _____

Marathon "World-Best" Times

In this activity, you will be looking at "world-best" times in the marathon for men and women. Note that these times are not considered "world records," due to the variety in courses around the world, but are still the fastest times recorded by men or women, and run in the years shown.

In the chart below, you will find representative samples of world-best times for men and women in various years. The times are in the form hours:minutes:seconds. You will enter these times and dates into the list feature in your calculator.

Year	Marathon time (Men)	Year	Marathon time (Women)
1964	2:13:55	1964	3:27:45
1967	2:12:00	1967	3:15:22
1971	2:09:36	1971	3:01:42
1981	2:08:18	1981	2:35:15
1985	2:07:12	1985	2:22:43
1998	2:06:05	1998	2:20:47
2001	2:05:42	2001	2:18:47
2003	2:04:55	2003	2:15:25

What would be an efficient way to enter the dates into the list feature of your calculator?

What would be an efficient way to enter the times into the list feature of your calculator?

In List 1, enter _____.

In List 2, enter _____.

In List 3, enter _____.

In List 4, enter _____.

Use the following settings for your window:

Xmin = -1

Xmax = 75

Xscl = 25

Ymin = -1

Ymax = 300

Yscl = 50

Xres = 1

Turn on Stat Plot 1, and plot the data for the men's marathon times. Graph the data, and describe what the graph looks like.

Do a regression on the data, and put the equation into Y1. Write the equation here:

What is the meaning of the y-intercept of this graph?

What is the meaning of the slope of this graph, if any?

Turn on Stat Plot 2, and plot the data for the women's marathon times. Use a different mark than you used for the men's times. Graph the data, and describe what the graph looks like.

Do a regression on the data, and put the equation into Y2. Write the equation here:

What is the meaning of the y-intercept of this graph?

What is the meaning of the slope of this graph, if any?

Calculate the point of intersection of the two graphs. What are the coordinates of the point of intersection?

What does this mean, in "real-world" terms?

Calculate the zeros of the graphs. What do the zeros mean?

Comment on how true-to-life you think this model is.

Is there a type of function that would better model the data for the world-best marathon times? If so, what type of function would be better? Why would this type of function be better? If there is no better function, why not?
