

## Making Predictions Using Systems of Equations INSTRUCTIONS

The table below shows the winning times in the Olympic 100 meter dash from 1960 to 1992.

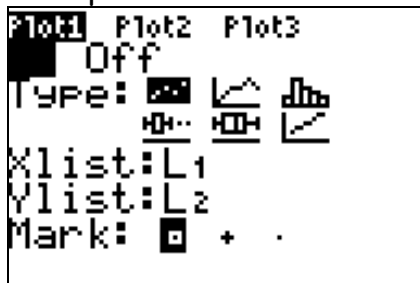
Years since 1960	Men's Time (sec)	Women's Time (sec)
0	10.2	11
4	10	11.4
8	9.9	11
12	10.14	11.07
16	10.06	11.08
20	10.25	11.06
24	9.99	10.97
28	9.92	10.54
32	9.96	10.82

1. Put the data into your calculator. Press STAT, then EDIT. Enter the values in L<sub>1</sub>, L<sub>2</sub>, and L<sub>3</sub>.

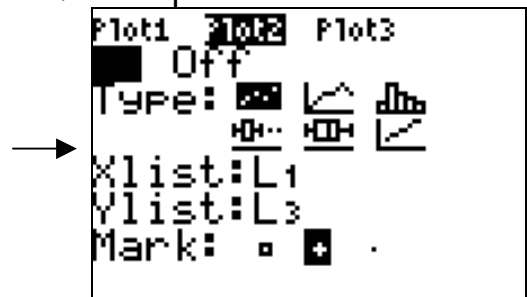
2. Create a scatter plot for each set of data:

a. Press 2<sup>nd</sup>, Y= (StatPlot).

b. Set up Plot 1 as shown:



c. Set up Plot 2 as shown:



3. Find the trend lines (linear regressions) for each plot

a. STAT→CALC→4:Lin Reg(ax+b)

b. Enter each of the regressions, one at a time. Record the equation on the student worksheet after you find each one:

```
LinReg(ax+b) L1,   LinReg(ax+b) L1,  
L2, Y1█           L3, Y2█
```

Hint: The  $Y_1$  and  $Y_2$  are under VARS→YVARS→1:Function

c. Change the window to:

```
WINDOW  
Xmin=-5  
Xmax=120  
Xscl=4  
Ymin=9  
Ymax=12  
Yscl=1  
Xres=1█
```

d. Press GRAPH. You should see both scatter plots and both trend lines.

4. Find the point of intersection for the two lines.

a. With the graphs on the screen, press 2<sup>nd</sup>→CALC

b. Choose 5:intersect

c. Place the cursor close to the intersection and press ENTER 3 times.

```
CALCULATE  
1:value  
2:zero  
3:minimum  
4:maximum  
5:intersect  
6:dy/dx  
7:∫f(x)dx
```

5. Answer all of the questions on the student worksheet.