

Note 9A/App • Collecting Jump and Roll Data Using the EasyData App

You must have a TI-83 Plus or TI-84 Plus to use this Note. If you have a TI-83, see **Note 9A** below. You can also use the programs CBRSET and CBRGET with any calculator. See page vi.

You will need a CBR (Calculator-Based Ranger).

Connect the CBR to the calculator. Press **[APPS]** and select EasyData. The CBR will immediately begin collecting distance data, which is displayed on your calculator screen.

Jump Option

To collect Jump data, press Setup (**[WINDOW]**) and select 2:Time Graph.... You will be shown the default settings for time interval and number of samples. Press Edit (**[ZOOM]**) to edit these settings. Enter 0.01 for the sample interval and press Next. Enter 100 for the number of samples and press Next. Then press OK.

Roll Option

To collect Roll data, press Setup (**[WINDOW]**) and select 2:Time Graph.... You will be shown the default settings for time interval and number of samples. Press Edit (**[ZOOM]**) to edit these settings. Enter 0.2 for the sample interval and press Next. Enter 50 for the number of samples and press Next. Then press OK.

Gathering Data

Press Start (**[ZOOM]**) to collect the data you have specified. You will be told that this function will overwrite the current list data. Press OK to continue. The calculator will collect the data and graph it.

To end the Application, press Main then press Quit. You will get a message telling you where the data is stored. Time data is in L1, distance data is in L6, velocity data is in L7, and acceleration data is in L8.

Note 9A • PARADAY Program

This program can be used with the TI-83, TI-83 Plus, and TI-84 Plus. However, if you have a TI-83 Plus or TI-84 Plus, you should consider using the EasyData App described in **Note 9A/App** above. You can also use the programs CBRSET and CBRGET with any calculator. See page vi.

This program reads either the CBL with a motion sensor or the CBR. Connect the CBL or CBR to your calculator.

Jump Option

Place the motion sensor on the floor pointing at a wall or object 1 meter away. Have the jumper stand halfway between. The jumper should jump after the sensor begins to “tick.” Time and distance data will be graphed, and will be saved to L1 and L2, respectively.

Roll Option

Place the motion sensor on the high end of an inclined table. An empty 2 lb coffee can works well for this experiment. Starting at the low end of the table,

(continued)

roll the can gently up the table when the sensor begins to “tick.” Time and distance data will be graphed, and will be saved to L1 and L2, respectively.

Get Data

When you are happy with the data you have gathered, you can link another calculator to the CBL or CBR and choose 3:GET DATA to retrieve the data into a second or third calculator. This will save you the difficulty of linking and sending lists among different models of calculators in the same group.

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PROGRAM:PARADAY
Menu(" PARABOLA
  DAY", " JUMP", 1, " ROLL", 2, " GET
  DATA", 3, " QUIT", 5)
Lb1 1
Disp " PLACE CBR ON", " FLOOR. STAND",
  " 0.5M FROM CBR.", " PRESS ENTER.",
  " JUMP WHEN YOU", " HEAR THE CBR."
Pause
ClrHome
Send({1,0})
Send({1,11,3})
Send({3,0.01,100,0,0,0,0,0,1})
Goto 4

Lb1 2
Disp " PRESS ENTER WHEN", " READY TO
  ROLL."

Pause
Send({1,0})
Send({1,11,3})
Send({3,0.2,50,0,0,0,0,0,1})
Goto 4

Lb1 3
Send({5,1})
Lb1 4
Get(L2)
Get(L1)
round(L1,2)→L1
Plot1(Scatter,L1,L2,.)
ZoomStat
Lb1 5
    
```

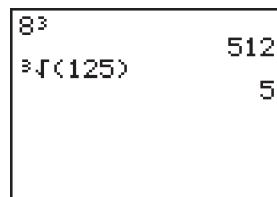
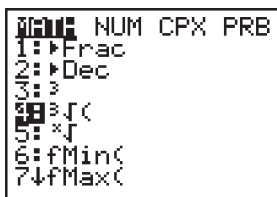
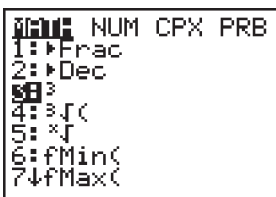
Errors

If you are not getting any data, check to see that the link cable is pushed in securely on both ends.

Note 9B • Cubes and Cube Roots

This calculator has two ways to find the cube and the cube root of a number. The first way involves functions found in the MATH menu. The second way uses the $\sqrt{\square}$ key.

To cube a number, enter the number in the Home screen, press \square MATH, select 3:³, and press \square ENTER. To find the cube root of a number, press \square MATH, select 4:³ $\sqrt{\square}$, enter the number, close the parentheses, and press \square ENTER.



As an alternative, you can use the $\sqrt{\square}$ key. To cube a number, enter the number in the Home screen and then press $\sqrt{\square}$ 3 \square ENTER. To find the cube root of a number, enter the number in the Home screen and then press $\sqrt{\square}$ (1 \div 3) \square ENTER.

