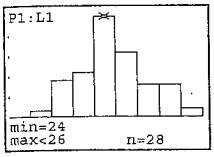
Technology Toolbox

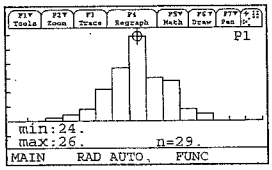
Normal probability plots on the TI-83/84/89

If you ran the program FLIP50 in Exercise 2.22 (page 133), and you still have the data (100 numbers mostly in the 20s) in L1/list1, then use these data. If you have not entered the program and run it, take a few minutes to do that now. Duplicate this example with your data. Here is the histogram that was generated at the end of one run of this simulation on each calculator.

TI-83/84



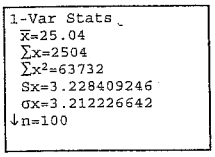
TI-89

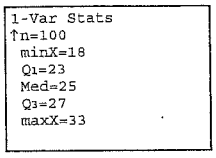


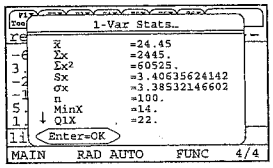
Ask for one-variable statistics:

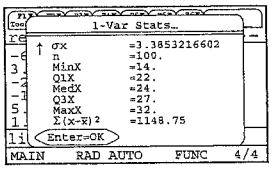
- Press STAT, choose CALC, then `1:1-Var Stats` and 2nd 1 (L1)
- In the Stats/List Editor, press; F4 (Calc) and choose `1:1-Var Stats` for list1.

This will give us the following:

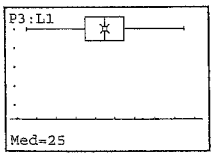


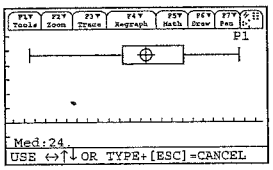






- Comparing the means and medians ($\bar{x} = 25.04$ versus $M = 25$ on the TI-83/84 and $\bar{x} = 24.45$ versus $M = 24$ on the TI-89) suggests that the distributions are fairly symmetric. Boxplots confirm the roughly symmetric shape.





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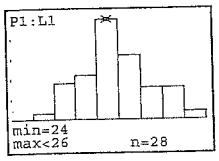
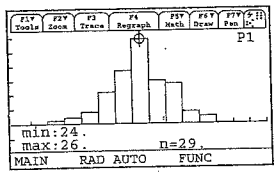


TI-89



Ask for one-variable statistics:

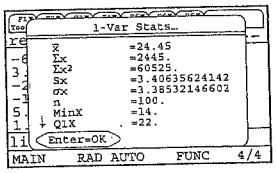
- Press STAT, choose CALC, then `1:1-Var Stats` and 2nd 1 (L1)

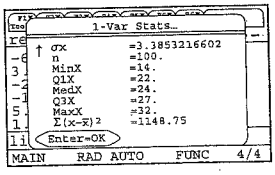
This will give us the following:

```
1-Var Stats
 x̄=25.04
 Σx=2504
 Σx²=63732
 Sx=3.228409246
 σx=3.212226642
↓n=100
```

```
1-Var Stats
↑n=100
 minX=18
 Q1=23
 Med=25
 Q3=27
 maxX=33
```

- In the Stats/List Editor, press; F4 (Calc) and choose `1:1-Var Stats` for list1.





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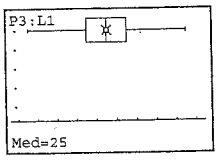
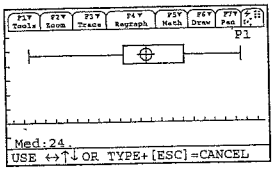
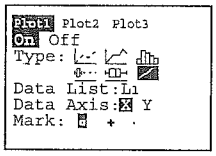


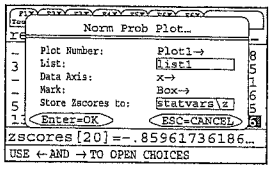


Technology Toolbox

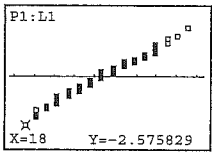
Normal probability plots on the TI-83/84/89 *(continued)*

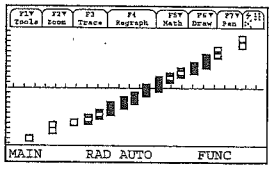
- To construct a Normal probability plot of the data *with the x-values on the horizontal axis*, define Plot 1 like this:





- Use ZoomStat (ZoomData on the TI-89) to see the finished graph.





Interpretation: The Normal probability plot is quite linear, so it is reasonable to believe that the data follow a Normal distribution.

Comment: The cursor on the bottom TI-83/84 screen shot is on the point with an x-value of 18 and a z-score of -2.58. This is the point with the smallest x-value of the 100 data values generated by the program FLIP50. By our definition, that puts the value of $x = 18$ at the 1% point. The alternative definition of percentile (see page 119) would place $x = 18$ at the 0% point, since no data values are below this one. The Normal probability plot on the TI-83/84 and TI-89 uses a compromise: it puts this point at the 0.5% mark. If we look up an area to the left of 0.0050 (0.5%) in Table A, we find that $z = -2.58$.