- **Excel:** Click on the cell in the upper left corner, then click on the function icon ***fx***. Select **Math & Trig,** then select **RANDBETWEEN.** In the dialog box, enter 1 for bottom, and enter 365 for top. After getting the random number in the first cell, click and hold down the mouse button to drag the lower right corner of this first cell, and pull it down the column until 25 cells are highlighted. When you release the mouse button, all 25 random numbers should be present. This display shows that the 1st and 3rd numbers are the same.

EXCEL

	A
1	15
2	3
3	15
4	362
5	164
6	184
7	158
8	59
9	143
10	85
11	134

- **TI-83/84 Plus Calculator:** Press MATH, select **PRB,** then choose **randInt.** Enter the minimum of 1, the maximum of 365, and 25 for the number of values, all separated by commas. Press ENTER. See the TI-83/84 Plus screen display below, which shows that we used **randInt** to generate the numbers, which were then stored in list L1, where they were sorted and displayed. This display shows that there are no matching numbers among the first few that can be seen. You can press STAT and select **Edit** to see the whole list of generated numbers.

TI-83/84 PLUS

```
randInt(1,365,25
→L1
{79 206 340 133…
SortA(L1)
                Done
L1
{17 34 46 70 79…
```

Example 3 Run of Six Heads or Tails

One of the author's favorite class activities is to give this assignment: All students take out a coin and flip it. Students getting heads go home and actually flip a coin 200 times and record the results. Students getting tails make up their own results for 200 coin flips. In the next class, the author could select any student's results and quickly determine whether the results are real or fabricated by using this criterion: If there is a run of six heads or six tails, the results are real, but if there is no such run, the results are fabricated. This is based on the principle that when fabricating results, students almost never include a run of six or more heads or tails, but with 200 actual coin flips, there is a very high probability of getting such a run of at least six heads or tails. This activity is more fun than human beings should be allowed to have. Unfortunately, the calculation for the probability of getting a run of at least six heads or six tails is *extremely* difficult. Fortunately, simulations can reveal whether such runs are likely in 200 coin flips. Without necessarily finding a probability value, simulate 200 actual coin flips, repeat the simulation a few times, then determine whether a run of six heads or tails is likely.

Solution

Let 0 = heads and let 1 = tails, then use some simulation technique to generate 200 digits that are all 0s and 1s. Now examine the list. It is easy to quickly determine whether there is a sequence of at least six 0s or six 1s. After repeating the simulation a few times, it will be obvious that a string of six 0s or six 1s will almost always occur, so the probability of getting such a string is very high.