```
10  PRINT "SIMULATION--BREAKING STICKS TO MAKE TRIANGLES"
20  PRINT
30  PRINT "HOW MANY STICKS DO YOU WANT TO BREAK";
40  INPUT D
50  LET N = 0
60  FOR I = 1 TO D
70  LET X = RND (1)
80  LET Y = RND (1)
90  IF X > = Y THEN 70
100  LET R = X
110  LET S = Y - R
120  LET T = 1 - R - S
130  IF R + S < = T THEN 170
140  IF S + T < = R THEN 170
150  IF R + T < = S THEN 170
160  LET N = N + 1
170  NEXT I
180  LET P = N/D
190  PRINT
200  PRINT "THE EXPERIMENTAL PROBABILITY THAT"
210  PRINT "A BROKEN STICK CAN FORM A TRIANGLE IS ";P
220  END
```

Line Number	Explanation
60–120	These lines simulate the breaking of each stick. When I = 10, for example, the computer is "breaking" the tenth stick.
130–150	Here the computer uses the Triangle Inequality to check whether the pieces of the broken stick can form a triangle. If not, the computer goes on to the next stick (line 170) and the value of N is not affected.
160	If the broken stick has survived the tests of steps 130–150, then the pieces can form a triangle and the value of N is increased by 1.
170	Lines 60–170 form a loop that is repeated D times. After I = D, the probability P is calculated and printed (lines 180–210).

Exercises

1. Pick any two numbers x and y between 0 and 1 with $x < y$. With paper and pencil, carry out the instructions in lines 100 through 150 of the program to see how the computer finds r, s, and t and tests to see whether the values can be the lengths of the sides of a triangle.
2. If you use a language other than BASIC, write a similar program for your computer.
3. Run the program several times for large values of D, say 100, 400, 800, and compare your results with those of some classmates. Does the probability that the pieces of a broken stick form a triangle appear to be less than or greater than $\frac{1}{2}$?