

TEKS a.1, a.5, a.6



Another Way to Solve Example 4, page 709

MULTIPLE REPRESENTATIONS In Example 4 on page 709, you found theoretical probabilities involving the sum of two dice. You can also perform a *simulation* to estimate these probabilities.

PROBLEM

DICE When two six-sided dice are rolled, there are 36 possible outcomes. Find the probability of the given event.

- a. The sum is not 6.
- b. The sum is less than or equal to 9.

METHOD

Using a Simulation An alternative approach is to use the random number feature of a graphing calculator to simulate rolling two dice. You can then use the results of the simulation to find the experimental probabilities for the problem.

STEP 1 **Generate** two lists of 120 random integers from 1 to 6 by entering `randInt(1,6,120)` into lists L_1 and L_2 . Define list L_3 to be the sum of lists L_1 and L_2 .

STEP 2 **Sort** the sums in list L_3 in ascending order using the command `SortA(L3)`. Scroll through the list and count the frequency of each sum.

L1	L2	L3
2	6	8
6	1	7
5	1	6
1	2	3
6	6	12

L3(1)=8

L3	L4	L5
2		
2		
2		
2		
2		

L3(1)=2

STEP 3 **Find** the probabilities.

- a. Divide the number of times the sum was 6 by the total number of simulated rolls, then subtract the result from 1.
- b. Divide the number of times the sum was greater than 9 by the total number of simulated rolls, then subtract the result from 1.

PRACTICE

- WRITING** Compare the probabilities found in the simulation above with the theoretical probabilities found in Example 4 on page 709.
- SIMULATIONS** Use the results of the simulation above to find the experimental probability that the sum is greater than or equal to 4. Compare this to the theoretical probability of the event.
- SIMULATIONS** Use the results of the simulation above to find the experimental probability that the sum is not 8 or 9. Compare this to the theoretical probability of the event.
- REASONING** How could you change the simulation above so that the results would be closer to the theoretical probabilities of the events? Explain.