

Problem

Sarah buys a 1 kilogram (kg) bag of potatoes at the market. There are five potatoes in the bag, with individual weights of 190 grams (g), 195 g, 200 g, 205 g, 210 g. She reaches into the bag and selects 4 potatoes without looking (i.e., at random) to cook for dinner.

- Use the table to list the weights of the four potatoes in each of the five possible sets of potatoes Sarah could select. Then calculate the total weight and the average weight of each set.
- What is the probability that the average (mean) weight of the four potatoes she selects is exactly 200 g?
- What is the probability that the average (mean) weight of the four potatoes she selects is at least 200 g?

Set	Weights of potatoes Sarah could select				Total Weight	Average Weight
	Potato 1	Potato 2	Potato 3	Potato 4		
1						
2						
3						
4						
5						



Hints

Suggestions:

1. Do the first part of part a) with the class, indicating that they will need to delete one potato to make each of the five sets of four potatoes. Then have students assist in filling in the weights of each potato in each set in the table, so that the whole class will be working with the same table. Finally, have them proceed with completing the table by finding totals and averages for each set.
2. Before going on to parts b) and c), remind the class that probability = $\frac{\text{number of desired outcomes}}{\text{total number of outcomes}}$.

Solution

- a) The five possible sets of potatoes are shown in the table below, along with the total weight and average weight of each set. (The order of the potatoes in each set may vary.)
- b) Since only 1 of the 5 sets has an average weight of 200 gm, the probability that the four potatoes Sarah selected have an average weight of 200 gm is 1 in 5, or $\frac{1}{5}$.
- c) Since 3 sets have an average weight greater than or equal to 200 gm, the probability that the set Sarah selected is one of these is 3 in 5, or $\frac{3}{5}$.

Set	Weights of potatoes Sarah could select				Total Weight	Average Weight
	Potato 1	Potato 2	Potato 3	Potato 4		
1	190	195	200	205	790	197.5
2	195	200	205	210	810	208.5
3	200	205	210	190	805	201.25
4	205	210	190	195	800	200
5	210	190	195	200	795	198.75