

3.1.1: Exercises

1. You are playing a game that involves picking different colored blocks from a bag. The bag contains 5 blue blocks and 3 green blocks. The game is won by picking a green block from the bag.
 - a. What is the probability that the game is won?

 - b. What is the probability that the game is not won?

2. You are creating a game for your classmates to play. You will fill a bag with a mixture of blue blocks and green blocks. You want the probability of winning the game by selecting a green block to be 35%. How many blue and green blocks should you fill the bag with?

3. John's bag of blocks contains 10 blocks, some of which are blue and some of which are green.
 - a. You play John's game 20 times. Below is a table containing the frequencies for which you picked a blue block and a green block.

	Frequency
Blue	5
Green	15
Total	20

What is the experimental probability of picking a blue block from the bag? What is the experimental probability of picking a green block from the bag?

- b. Based on these observations, how many blocks do you think are blue?

- c. Based on these observations, what do you think the theoretical probability of selecting a blue block is?

- d. You play John's game 200 times. Below is a table containing the frequencies for which you picked a blue block and a green block. Complete the table by filling in relative frequencies. Estimate how many blue and green blocks are in John's bag of 10 blocks.

	Frequency	Relative Frequency
Blue	61	
Green	139	
Total	200	

4. Tatiana's game has 2 red blocks and 6 blue blocks. If you play her game 100 times, about how many times do you expect to pick a red block?
5. Pablo is playing a game that involves flipping a coin and rolling a 8-sided die.
- Construct the sample space. How many possible outcomes are in the sample space?
 - What is the probability of rolling an even number and heads?
 - What is the probability of rolling a 1 or 8 and tails?

6. Imagine that a pharmaceutical company has developed a new drug to treat anxiety. The company thoroughly tested the new drug in many clinical trials. Clinical trials, by law, must involve a very large number of patients. The results of the clinical trials for the new drug show that it lowers anxiety in 75% of patients. A local doctor gave the new drug to her patients with anxiety. After taking the drug, 90% of those patients experienced less anxiety. The doctor was so excited that she now claims the drug is a medical breakthrough.
- a. Which is more likely to be closer to the true percentage of patients who will have their anxiety reduced by the drug? 75% or 90%? Explain your answer.
- b. The drug's success rate in reducing patients' anxiety in the clinical trials was different from the drug's success rate for the doctor's patients. Why might that be? In explaining your reasoning, think about the Law of Large Numbers.

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