



**Problem 1 – Experimental probability**

**Table 1:** Roll a die five times. Use the tally table to record if each result is a success (rolling a 6) or a failure (rolling a 1, 2, 3, 4, or 5). Repeat nine more times.

Success	Failure

**Table 2:** Use the tallies in Table 1 to record the number of successes and the percent of successes for each of the 10 experiments.

	0	1	2	3	4	5
Number of Successes						
Percent of Successes						

**Table 3:** Complete the table below by simulating 10 experiments using the **randBin** command.

	0	1	2	3	4	5
Number of Successes						
Percent of Successes						

**Problem 2 – Theoretical probability**

**Table 4:** Find  $\text{binomPdf}\left(5, \frac{1}{6}\right)$  and complete the table.

	0	1	2	3	4	5
Percent						

1. Compare the experimental probabilities to the theoretical probabilities.
2. Calculate  $\text{binomPdf}\left(2, \frac{1}{6}\right)$  and  $\text{binomPdf}\left(8, \frac{1}{6}\right)$ .
3. Explain how and why the probability distribution changes. Which gives a greater probability of exactly 2 successes? Explain your reasoning.

4. Find  $\text{binomPdf}\left(1, \frac{1}{6}, 2\right)$ . Explain why you get this result.
  
5. Use  $\text{binomCdf}\left(5, \frac{1}{6}, 2\right)$  to find the probability of two or fewer successes.
  
6. Then find the probability of at least three successes.

### Problem 3 – Using the formula

7. On page 3.1, or below, list all the arrangements of two successes and three failures in five trials. One arrangement is done for you.

**SSFFF**

8. What is the probability of *each arrangement*? Why?
  
9. How many arrangements are there?
  
10. What is the *total* probability of two successes in five trials?
  
11. What is the formula for finding a binomial probability?
  
12. The probability of randomly guessing any correct answer on a multiple-choice test is 0.25. The test has 15 questions. Find the probability of guessing:
  - exactly 10 answers correctly
  
  
  - at least 10 answers correctly