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| **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.   |  |  | | --- | --- | | **Successes** | **Failures** | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | **Table 2:** Use the tallies in Table 1 to record the number of trials and the percent of trials in which each number of successes occurred.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | **0** | **1** | **2** | **3** | **4** | **5** | | **Number of Trials** |  |  |  |  |  |  | | **Percent of Trials** |  |  |  |  |  |  |   **Table 3:** Complete the table below by simulating 10 experiments using the **randBin** command.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | **0** | **1** | **2** | **3** | **4** | **5** | | **Number of Trials** |  |  |  |  |  |  | | **Percent of Trials** |  |  |  |  |  |  | |

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| **Problem 2 – Theoretical Probability** |
| **Table 4:** Find **binomPdf(5,1/6)** and complete the table.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | **0** | **1** | **2** | **3** | **4** | **5** | | **Percent** |  |  |  |  |  |  | |
| **1.** Compare the experimental probabilities to the theoretical probabilities.  **2.** Find **binomPdf(2,1/6)** and **binomPdf(8,1/6)**.  **3.** Explain how and why the probability distribution changes. Which gives a greater probability of exactly 2 successes? Why? |
| **4.** Find **binomPdf(1,1/6,2)**. Explain why you get this result.  **5.** Use **binomCdf(5,1/6,2)** 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.** Below, list all the arrangements of two successes and three failures in five trials. One arrangement is done for you.  **SSFFF**  **8.** How many arrangements are there?  **9.** What is the probability of each arrangement? Why?  **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:  **a.** Exactly 10 answers correctly    **b.** At least 10 answers correctly |