NYCCT MAT2572 Halleck Fall 2015 Practice exam 1

* You may use a scientific or graphing calculator.
* At the end of class, be sure to turn in your formula sheet (1 sheet, 2 pages, hand-written), worth 10%.
1. The formula **=B$2\*$A2** is located in cell **B1**.
	* 1. What does cell B1 evaluate to?
		2. If this was copied and pasted into cell D3, what would the resulting formula be?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** |
| **1** |  2 | **=B$2\*$A1** | 4 |  5 |
| **2** | 3 | 3 | 8 | 6 |
| **3** | 5 | 4 | 3 | ????????? |
| **4** | 4 | 3 | 4 | 9 |

1. Consider an experiment that consists of withdrawing a ball from the box, replacing it, and withdrawing a second ball. Draw a tree diagram. Be sure to include labels and probabilities. Use the tree diagram to make a table with outcomes and probabilities. **Express all probabilities as fractions in lowest terms.** There are 2 red, 2 blue and 1 green ball in the box.
	1. What is the sample space of this experiment?
	2. As a set, what is the event A: the first ball drawn is red? What is its probability?
	3. As a set, what is the event B: the same color ball is drawn twice? What is its probability?
2. On an outing of 100 students to a state park, 40 students brought neither a backpack nor a hat, 50 brought a hat, and 40 brought a backpack. If one of them was randomly chosen, find the probability that he or she brought
3. A backpack or a hat
4. A backpack and a hat
5. 2 fair 6-sided die are rolled (one green & one red) & the outcome is coordinate (green face, red face).
	1. Let A be the event that the faces sum to an even number greater than 8. Find P(A).
	2. Let B be the event that the faces are the same (doubles). Find P(B).
	3. Find A **∩** B as set. Find P(A **∩** B).
	4. Are A and B independent events?
6. In a game, each spinner is spun once and the results are added.



* 1. Use a tree to find paths to the outcomes and their probabilities.
	2. Find the random variable that represents the game

(make a table with the possible outcomes and their probabilities).

1. Three cards are pulled from a deck of 52 cards. Find the probability of obtaining
	1. at least one club.
	2. a pair.
	3. 3 of a kind.
	4. straight (3 cards whose face values are in order, an ace can be lower than 2 or higher than king.)
	5. a flush (all 3 of the same suit)
	6. a straight flush
	7. use your answers to d, e, f to determine whether getting a straight and getting a flush are independent events.
2. A jar contains 3 chocolate chip cookies and x oatmeal cookies. Two cookies are pulled from the jar without replacement.
	1. Find an expression that represents the probability one cookie is chocolate chip and the next cookie is oatmeal.
	2. Find an expression that represents the probability one cookie is chocolate chip and the other cookie is oatmeal, regardless of the order in which they come out.
3. A 5 digit PIN number can begin with any digit (except zero) and the remaining digits have no restriction.
	1. If repeated digits are allowed, find the probability of the PIN code beginning with a 7 and ending with an 8.
	2. If repeated digits are not allowed, find the probability of the PIN code is odd.
	3. Find the probability that the PIN code is odd if repeated digits are allowed.
	4. Are the events PIN is odd and PIN has no repeated digits independent?
4. There are 12 runners in a marathon. A person may bet on the race by predicting the top three runners and the order they finish in. If they do so correctly, the person wins the grand prize. There is a consolation price if they have selected the 3 top finishers but not the order. All runners have an equal chance of winning. Find the probability that a single bet will win
	1. the grand prize.
	2. the consolation prize.
5. A grocery story obtains 35% of its produce from vendor A, and 65% of its produce from vendor B. It is expected that spoilage will result in 12% of vendor A's produce and 17% of vendor B's produce to be discarded. Find the probability a randomly picked produce item came from vendor A, given that it was picked from the discard pile.