MATH FIELD DAY 2023 PROBABILITY          Name: _____ School: _____

**Round your answers to four decimal places if needed unless otherwise specified.**

_____1.  A 20-sided die is rolled and a fair coin is tossed. Find the probability that the die shows an odd number and the coin shows a head.

_____2.  In a class of 20 students, 12 of them like math. One-third of the students who like math are aged 15 and the rest are 16. Three-fourths of the students who don't like math are aged 15 and the rest are 16. A student from this class is selected at random. Find the probability that the student likes math given that the student is sixteen years old.

_____3.  Find the probability of randomly selecting a bill and getting a $20 bill out of a wallet with 4 twenties, 3 tens, 4 fives, and 7 ones.

_____4.  A game is set up by tossing a weighted coin three times. This weighted coin lands on tails with a probability of 60%. If you get more heads than tails, you win the game and get a prize. Find the probability that you will win the game.

_____5.  At SEMO, 35% of the freshmen are enrolled in a mathematics course, 40% are enrolled in an English course, and 20% are taking both. Find the probability that a randomly selected freshman is taking a mathematics course given that the person is not taking an English course.

_____6.  At a particular fro-yo store, there are a total of 10 different fro-yo flavors. You grab a cup and place a separator in the cup so that your cup has three compartments for fro-yo. Find the number of combinations of fro-yo you can have if you only put one flavor in each compartment.

_____7.  Yahtzee is a five fair six-sided dice game. The objective of the game is to score points by rolling five dice to make certain combinations. The dice can be rolled up to three times in a turn to try to make various scoring combinations. One of the scoring combinations is getting 4-of-a-kind, such as getting a 1,1,1,4,1 on the five dice. Find the probability that you will roll a 4-of-a-kind on the first roll.

_____8.  The license plate in the state of Missouri is made with 6 characters. Each character can be a letter or a digit from 0-9, and repetitions are allowed in both letters and digits. Find the probability that a Missouri license plate starts with SEMO followed by two digits. (Round to two decimal places in scientific notation.)

_____9.  There are 3 urns each containing red and black marbles as shown in the table below. You draw one marble from Urn 1. If you draw a red marble from Urn 1, you make your second draw from Urn 2. If you draw a black marble from Urn 1, you make your second draw from Urn 3. Find the probability of drawing two marbles of different colors.

|              | Urn 1 | Urn 2 | Urn 3 |
| ------------ | ----- | ----- | ----- |
| Red Marble   | 2     | 3     | 5     |
| Black Marble | 8     | 6     | 4     |