

# MATH 362—Work Sheet 03

Dr. Justin M. Curry

Given on January 27, 2020 and Due on January 29, 2020

Name: \_\_\_\_\_

1. (1 point) Suppose I have  $N$  students and I go around and ask everyone their birthdays. What is the size of the sample space  $\Omega$  in this experiment?
2. (1 point) Continuing Question 1, If  $B$  is the event that no one has the same birthday. Describe in words what  $B^c$  represents.
3. (2 points) Since asking people their birthdays can be a little personal. Instead imagine that I ask everyone what their astrological sign ([https://en.wikipedia.org/wiki/Astrological\\_sign](https://en.wikipedia.org/wiki/Astrological_sign)) is. Assuming there are 40 people in my class. What's the probability that at least three people have the same sign? Explain your answer.
4. (1 point) What's the difference between a Tarot reading and being dealt a five card hand?
5. (3 points) In a state lottery, 5 distinct numbers are drawn from the numbers  $1, 2, \dots, 40$  uniformly at random.
  - (a) (1 point) Describe a sample space  $\Omega$  and a probability measure  $P$  to model this experiment.
  - (b) (2 points) What is the probability that out of five picked numbers exactly three will be even?
6. (2 points) Suppose that a bag of scrabble tiles contains 5 E's, 4 A's, 3 N's, and 2 B's. Suppose I draw 4 tiles from the bag without replacement uniformly at random. Let  $C$  be the event that I draw two E's, one A and one N.
  - (a) (1 point) Compute  $P(C)$  by imagining that the tiles are drawn one by one as an ordered sample.
  - (b) (1 point) Compute  $P(C)$  by imagining that the tiles are drawn all at once as an unordered sample.
7. (1 point) What's the probability of a full house?