MATH 362—Work Sheet 04

Dr. Justin M. Curry

Due on Tuesday (!) February 16, 2021

Name:			
Nama			
name.			

- 1. (4 points) An urn contains 15 red balls, 20 green balls and 12 yellow balls. Consider the experiment where we draw two balls without replacement. Consider the event A where exactly one red ball or one yellow ball is drawn.
 - (a) (2 points) Decompose the event A into three mutually exclusive events and use this decomposition to compute the probability of A.

(b) (2 points) Notice that A is the union of the events

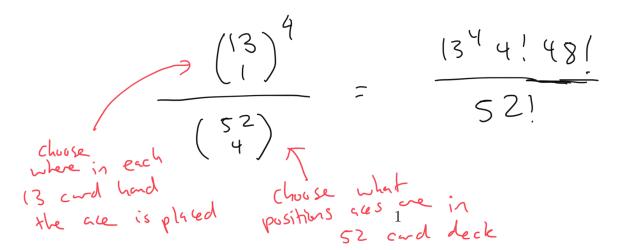
 $R = \{\text{exactly one red ball is drawn}\} \cup Y = \{\text{exactly one yellow ball is drawn}\}$

Why are these events not disjoint? Compute P(A) using the formula

$$P(A) = P(R) + P(Y) - P(R \cap Y).$$

Not disjoint because RY \in R \tau R \tau R \tau R \tau \text{, and RY \in Y, and RY \in Y, and RY \in Y, \text{ and RY \in Y, and RY \in Y, \text{ and RY \in Y, a

2. (2 points) Suppose I deal a regular 52 card deck to 4 people, by giving each person 13 cards uniformly at random. What's the probability that each person gets exactly one Ace?



- 3. (2 points) An urn contains 10 red balls, 7 green balls and 3 yellow balls. Draw 5 balls.
 - (a) (1 point) What's the probability that you draw 2 red, 2 green and 1 yellow?
 - (b) (1 point) Same experiment as above. What's the probability that you draw 2 red, 1 green and 2 yellow?

a)
$$\binom{10}{2} \binom{7}{2} \binom{7}{1}$$

$$\frac{\binom{20}{5}}{\binom{5}{1}}$$

$$\frac{\binom{10}{2}\binom{7}{1}\binom{3}{2}}{\binom{20}{5}}$$

4. (1 point) How many ways are there of rearranging the letters in WAAHOOO?

$$\left(\frac{7}{3},\frac{7}{2!}\right) = \frac{7!}{3!2!} = \frac{7!}{3!2!}$$

5. (1 point) 6 people in a house are charged with completing one of three different chores: two people sweep, two people clean bathrooms, and two people do the dishes. How many ways are there of assigning people to do these tasks?

$$\begin{pmatrix} 6 \\ 2 \end{pmatrix} \begin{pmatrix} 4 \\ 2 \end{pmatrix} \begin{pmatrix} 2 \\ 2 \end{pmatrix}$$

6. (1 point) How many ways are there of splitting 6 people into 3 pairs?

ways are there of splitting 6 people into 3 pairs?

$$\begin{pmatrix}
6 \\
2
\end{pmatrix}
\begin{pmatrix}
4 \\
2
\end{pmatrix}
\begin{pmatrix}
2 \\
2
\end{pmatrix}$$

Not in 6