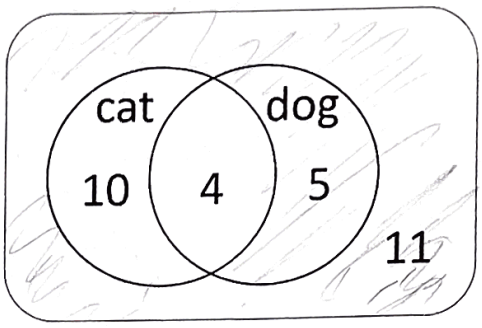
Analysis H 2021-2022 – Hahn / Tantod
Unit 4: Probability Quiz 2
NO CALCULATORS – each question is worth 2 pts **32 pts**

30

Feeling Lucky: Chris Lee
Period: 3

***For Questions 1 and 2**: The Venn Diagram on the right shows the result of a survey, "do you own a cat or a dog?" Let C = cat and D = dog.*



1. Which of the following represents 11/30 of the people surveyed? (IMPORTANT: Circle **ALL** that apply)

a) $P(C \cup D)$ b) $P(C' \cap D')$ ~~c) $P(C' \cap D')$~~

d) $P(C \cap D)'$ e) $P(C \cup D)'$

2. What is $P(D|C')$?

D given not C $P = \frac{5}{16}$

3. Two fair, 6-sided dice are rolled (each one numbered 1-6). Find...

a) P(sum is 10) = $\frac{1}{12}$

b) P("sum is greater than 7" OR "sum is an odd number") = $\frac{27}{36}$

c) P("sum is greater than 7" | "sum is an odd number") = $\frac{6}{18}$

d) The 2 dice are rolled 10 times in a row and the sum of the dice is recorded each time. What is the probability that the sum was more than 10, exactly 4 times?

$p = \frac{1}{12}$, $n = 10$, $k = 4$

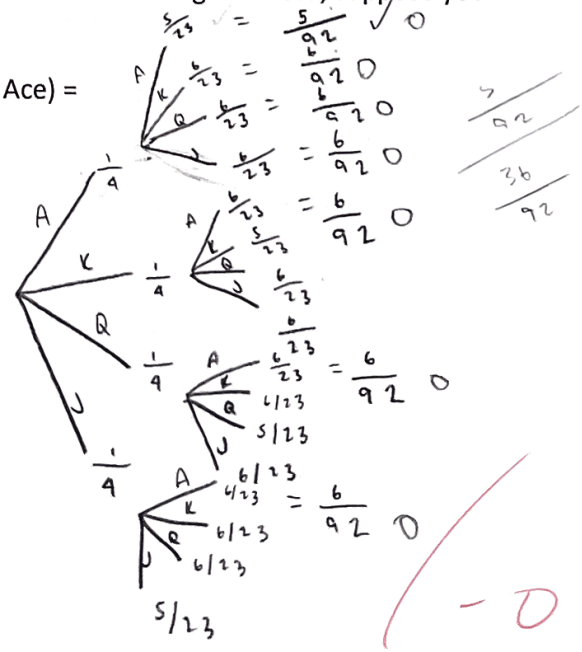
$$\binom{10}{4}\left(\frac{1}{12}\right)^4\left(\frac{11}{12}\right)^6$$

4. Krafty Callie has a strange deck of cards with 6 Aces, 6 Kings, 6 Queens, and 6 Jacks. Using this deck, suppose you draw a card, DON'T replace it, and then draw another card. Find...

a) P(drawing an Ace on the 2nd card, given that your 1st card was an Ace) = $\frac{5}{23}$

b) P(drawing 2 Aces) = $\frac{5}{92}$

~~c)~~ P(drawing 2 Aces, given that at least one of the cards is an Ace) = $\frac{5}{41}$



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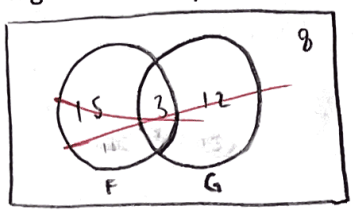
5. In a certain Analysis H class of 30 students, 18 of them have Flair, and 15 of them have Gumption. If 8 of them have neither Flair nor Gumption (don't worry, they have other great qualities)...

a) Draw a Venn Diagram for this premise.



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22

18
15
33

8

7 11 4

b) What is the probability that a randomly selected student will have Flair, ~~given that~~ they have Gumption?

$P = \frac{3}{15}$ -1

11

15

c) Are the events "have Flair" and "have Gumption" mutually exclusive? Give a short (one sentence) explanation to justify your answer.

NO, because both can happen at the same time.

6. In a normal 52-card deck there are 12 face cards and 40 non-face cards. Felix draws a random card from the deck.

- If the card is a face card, Felix rolls a 6-sided die and records the number (1-6)
- If the card is a non-face card, Felix rolls a 10-sided die and records the number (1-10)

a) P(choosing a face card and then rolling an odd number) =

$\frac{12}{52} \cdot \frac{1}{2} = \frac{12}{104}$ ✓

b) P(he records an 8 | he chose a non-face card) =

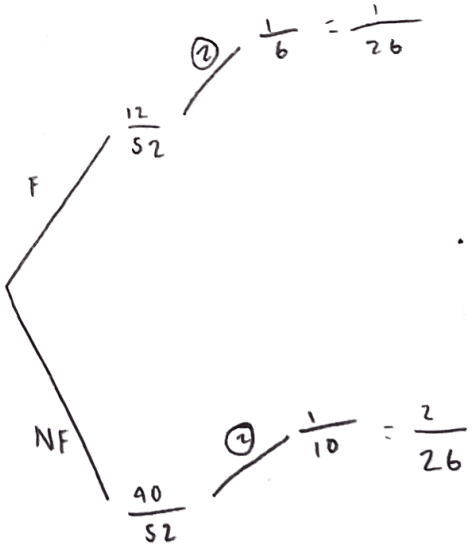
$\frac{1}{10}$ ✓

c) P(he chose a non-face card | he records an 8) =

1

d) P(he chose a face card | he records a 2) =

$\frac{1}{3}$



$\frac{4}{52} = \frac{2}{?}$

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