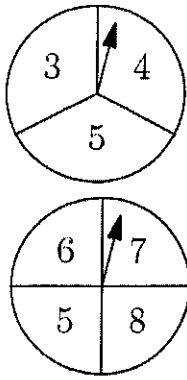


1. Complete the sample space for the sum of the spinners then complete the questions. You MUST show your initial fraction set-up.



	3	4	5
5	8	9	10
6	9	10	11
7	10	11	12
8	11	12	13

a. P(sum of 11) $\frac{3}{12} = \frac{1}{4}$	b. P(sum of 6 or 3 on first) $\frac{2}{12} + \frac{4}{12} - \frac{1}{12} = \frac{5}{12}$
c. P(even sum and 7 on second) $\frac{2}{12} = \frac{1}{6}$	d. P(matching given even sum) $\frac{1}{6}$

2. Decide whether each of the following pairs of events are independent or dependent. Explain your reasoning. Then calculate the probabilities.

a. The experiment is drawing a card from a shuffled deck of playing cards, drawing a face card, then passing the deck to the next student without replacing a card for them to draw an Ace. Independent -or- Dependent (Circle One)

without replacement - prob changes

$$\frac{12}{52} \cdot \frac{4}{51} = \text{---}$$

b. The experiment is drawing a marble from a bag of 5 blue and 2 red marbles, drawing a blue one, then replacing the marble and passing the bag to the next student to draw a blue one. Independent -or- Dependent (Circle One)

with replacement prob stays the same

$$\frac{5}{7} \cdot \frac{2}{7} = \frac{10}{49}$$

3. Decide whether each of the following pairs of events are mutually exclusive. Explain your reasoning. Then calculate the probabilities.

a. The experiment is drawing a single card from a shuffled deck of playing cards that is a Queen and 5.

Mutually Exclusive -or- Not (Circle One)

It cannot happen at the same time  $P = 0$

b. The experiment is rolling a regular 6 sided die once and getting a roll that is even and prime.

Mutually Exclusive -or- Not (Circle One)

Overlap  $\rightarrow 2$  is both  $\frac{1}{6}$

(2) 4, 6 (2)

4. A survey of 500 sophomores asked if they prefer watching basketball or baseball and if they were males or females. The results of the survey are in the table below.

	Prefers Basketball	Prefers Baseball	Total
Boys	167	116	283
Girls	146	71	217
Total	313	287	500

Suppose that you randomly select one of these students.

a. Find $P(\text{Student is a girl and prefers baseball})$ $\frac{71}{500}$	b. Find $P(\text{student is a girl or prefers baseball})$ $\frac{146}{500} + \frac{116}{500} + \frac{71}{500} = \frac{333}{500}$
c. Find $P(\text{student is a girl} \mid \text{prefers baseball})$ $\frac{71}{287}$	d. Is the probability of being a girl independent of preferring basketball? Give mathematical evidence. $P(G) \stackrel{?}{=} P(G \mid \text{Baseball})$ $\frac{217}{500} \stackrel{?}{=} \frac{71}{287} \rightarrow 0.431 \neq 0.247$ <u>no</u>

5. John Elway wants to predict model the chances of the Bronco's winning the Super Bowl LIV using a standard card deck - one card draw at a time with replacement - if it is a red card means they win, a black card means they lose. The table at the right shows the results of his card draws.

a. Based on the results, do you think the Broncos will win the Super Bowl?

maybe ...

b. Evaluate the model using the results in the table. Is this a good model? Explain.

No - their chances are not 50% as the red card indicates

*Simulation*

Sample Size	Number of "wins"	Percent of "wins"
4	3	75%
12	7	58.3%
30	16	53.3%
50	24	48%

*Yes* (circled in green)  
*No* (circled in red)