**Dependent and Independent Events, Mutually Exclusive Events versus NOT Mutually Exclusive Events**

Dependent Events require that one event impacts the probability of a second event occurring.

Independent Events require that probability of events are NOT impacted by the occurrence of previous events.

Mutually Exclusive Events require that two outcomes or events CANNOT happen at the same time

Not Mutually Exclusive Events can happen at the same time

Sample questions related to a marble set in a bag

You have four marbles in a bag, these are 2 black marbles, one white, and one red marble.

1.  Determine the probability of drawing a black marble, then a white marble WITHOUT replacement


2.  Are the events in #1 mutually exclusive?  Why or Why not?


3.  Are the events in #1 independent?  Why or Why not?


4.  Determine the probability of drawing a black marble OR a white marble


5.  Are the events in #4 mutually exclusive?  Why or Why not?


6.  Are the events in #4 independent?  Why or Why not?


7.  Determine the probability of drawing a black marble, then a white marble WITH replacement


8.  Are the events in #7 mutually exclusive?  Why or Why not?


9.  Are the events in #7 independent?  Why or Why not?

You have four marbles in a bag, these are 2 black marbles, one white, and one red marble.

State the following and their related probabilities

10. What is most likely event in a single draw from this bag?        Related probability _____

11. What is least likely event in a single draw from this bag?        Related probability _____

12. Which events are equally likely to happen?                Related probability _____

13. Complete the table related to probabilities related to drawing TWO marbles WITH replacement

|  | State as a fraction | State as a decimal | State as a percentage |
|---|---|---|---|
| P(two black marbles) | | | |
| P(two red marbles) | | | |
| P(two blue marbles) | | | |
| P(red and blue marbles) | | | |

14. Complete the table related to probabilities related to drawing TWO marbles WITHOUT replacement

|  | State as a fraction | State as a decimal | State as a percentage |
|---|---|---|---|
| P(two black marbles) | | | |
| P(two red marbles) | | | |
| P(two blue marbles) | | | |
| P(red and blue marbles) | | | |

Assume you have a deck of playing cards, express the probabilities as a fraction, decimal, and a percent

15. Determine the probability of drawing a jack or a black card

    Fraction _____ Decimal _____ Percent_____

16. Determine the probability of drawing a black jack

    Fraction _____ Decimal _____ Percent_____

17. Is drawing a black card and drawing a jack mutually exclusive?   Why or Why Not?