

**Sec 6.3– Applications of Probability  
Independent Probability**

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

Two events are said to be **Independent** if the occurrence of the first event does **NOT** affect the probability of the second event and events are independent if  $P(A) \cdot P(B) = P(A \text{ and } B)$

**INDEPENDENT PROBABILITY**

1. Determine the following probabilities if each of the following are **independent**.

**GIVEN:**  $P(A) = 0.8$

$P(B) = 0.25$

$P(C) = 0.6$

- a.  $P(A \text{ and } C) =$

Decimal:

- b.  $P(A \text{ and } B \text{ and } C) =$

Decimal:

- c.  $P(\text{Rolling a 4 on a standard die and } B) =$



Decimal:

- d. Find  $P(D)$  if  $D$  is an independent event and

$P(C \text{ and } D) = 0.10$

Decimal:



- e.  $P(\text{Rolling a 2 on a standard die and picking a card with a "7" on it from a standard deck of cards}) =$

Decimal:

- f. If your chances of losing the shell game if you randomly pick is 2 in 3. What are the chances that you would lose 5 games in a row?

Decimal:



- g. If the Atlanta Hawks free throw percentage is 82%, what is the probability that a player for the Hawks will make 2 free shots in a row?

Percentage:

- h. The chance of rain on a random day in May in Gwinnett is about 30%. Using this empirical probability, what would you estimate the probability of having NO rain for an entire week (7 days)?

Percentage:



- i. (BONUS) Nancy estimates that the probability that a tornado will strike within the city limits on any given year is 0.75%. What is the probability of at least one tornado touching down in the next 5 years? (must use complements)

Percentage:

- 2.

**GIVEN:**  $P(M) = 0.8$

$P(N) = 0.25$

$P(R) = 0.6$

- a. If the probability of  $P(M \text{ and } N) = 0.2$ , are  $M$  and  $N$  independent?

- b. If the probability of  $P(N \text{ and } R) = 0.3$ , are  $N$  and  $R$  independent?

## DEPENDENT PROBABILITIES

3. Consider that 3 consecutive cards are drawn **without replacement** from a shuffled deck of cards

A. What is the probability that the first two cards drawn are face cards?

Decimal:



B. What is the probability that the all three cards are hearts?

Decimal:

C. What is the probability that all three cards are a King?

Decimal:

D. What is the probability that all three cards are the same ?

Decimal:

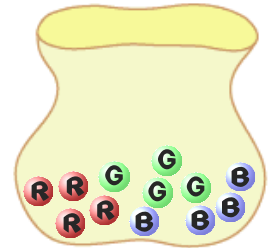
4. A bag contains 4 blue marbles, 4 red marbles, and 4 green marbles:

A. What is the probability of drawing 2 green marbles **without replacement**?

Decimal:

B. What is the probability of drawing 3 marbles without replacement in a row of the same color **without replacement**?

Decimal:



5. James has 3 dimes, 4 pennies, and 2 quarters in his pocket. If each coin is equally likely to be pulled out of his pocket in order **without replacement**, what is the probability that he will pull out the 2 quarters in a row first?



Reduced Fraction:

6. In a cookie jar there are 10 chocolate chip cookies and 8 peanut butter cookies left. The cookies are randomly mixed together in the jar. What is the probability of pulling two of the same types of cookies out of the cookie jar in a row **without replacement**?



DECIMAL:

7. In a classroom there are 7 male students and 11 female students that are taking a test. If each student is equally likely to turn in their test at any given time at the end of class, what is the probability that the first 3 students to turn in their test are female students?



DECIMAL: