

Name: \_\_\_\_\_ Hour \_\_\_\_\_ **Probability With and Without Replacement & Independent or Dependent**

**Independent Events:**  $P(A \text{ and } B) = P(A) \cdot P(B)$

**Dependent Events:**  $P(A \text{ and } B) = P(A) \cdot P(B | A)$

**You have a jar of gumballs: 4 red, 9 green, 8 blue, 6 yellow, and 3 white. One gumball is drawn randomly. Find the following Probabilities and write as a reduced fraction and as a percent.**

1. P(white)                      2. P(green)                      3. P(blue  $\cup$  yellow)                      4. P( $\overline{\text{Red}}$ )

You roll a 6 sided die one time. Find the following probabilities. Write as a reduced fraction and as a percent.

5. P(7)                      6. P(1  $\cup$  2)                      7. P(odd number)                      8. P( $\overline{6}$ )

**In your math class there are the following white board markers at the board: 2 green, 2 blue, 2 red, 1 purple, and 1 black. One student randomly chooses a marker and then replaces it. The second student then chooses a marker. What is the probability of the students randomly choosing the colors listed below? Write as a percent**

9. P(green, blue)                      10. P(red, purple)
11. P(black, black)                      12. P(purple, green)

**In your sock drawer you have 10 pairs of white socks, 4 pairs of black, and 2 pairs of brown. You randomly choose a pair of socks each day. Sometimes you don't replace them because they are dirty. You choose another pair of socks the next day. Find the probability of the following situations. Write the probability as a reduced fraction.**

13. P(white, white) with replacement                      14. P(white, black) without replacement
15. P(black, brown) without replacement                      16. P(brown, brown) without replacement
17. P(white, white, white) with replacement                      18. P(white, black, brown) with replacement
19. P(black, white, white) without replacement                      20. P(brown, brown, brown) with replacement

**Determine if the following events are dependent or independent. Then calculate the probability of each.**

21. Selecting a glazed donut from an assortment of sixteen donuts, 4 glazed, 4 with sprinkles, 4 maple bars, and 4 cake donuts. Then eating it, and then selecting a maple bar from the same box.
22. Given a bag of marbles with 2 red, 3 green and 2 blue. What is the probability of choosing a red marble keeping it, then choosing another red marble?
23. Rolling a 3 on a dice and then drawing a red card from a deck of cards.
24. You are choosing two cards from a deck. The first card is a queen, if you keep that card what is the probability that the second card is a face card?
25. Flipping a coin, and getting tails both times.

**Independent Events:**  $P(A \text{ and } B) = P(A) \cdot P(B)$

**Dependent Events:**  $P(A \text{ and } B) = P(A) \cdot P(B | A)$

26. Events A and B are independent. Find the missing probability

$$P(A) = .73$$

$$P(A) = .15$$

$$P(A) =$$

$$P(B) =$$

$$P(B) = .62$$

$$P(B) = .85$$

$$P(A \text{ and } B) = .28$$

$$P(A \text{ and } B) =$$

$$P(A \text{ and } B) = .33$$

27. Events A and B are dependent. Find the missing probability

$$P(A) = .37$$

$$P(A) =$$

$$P(A) = .41$$

$$P(B|A) = .18$$

$$P(B|A) = .61$$

$$P(B|A) =$$

$$P(A \text{ and } B) =$$

$$P(A \text{ and } B) = .57$$

$$P(A \text{ and } B) = .35$$