

Quiz 5 Review Sheet—Probability

Name: _____

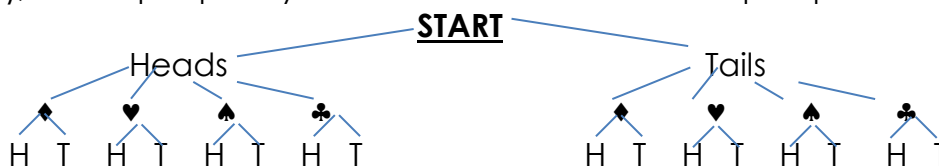
Vocabulary—Use your notes to find the exact answer that fits each blank.

1. **Probability** is the chance of an event occurring.
2. A **probability experiment** is the chance process that leads to well-defined results called outcomes.
3. The result of a single trial in a probability experiment is called an **outcome**.
4. The set of all possible outcomes of a probability experiment is called the **sample space**.
5. A subset of the sample space is called an **event**.
6. An event with only one possible outcome is a **simple** event.
7. An event with more than one possible outcome is a **compound** event.
8. **Classical probability** uses sample spaces to determine the numerical probability that an event will happen.
9. **Empirical probability** is based on the observations obtained from an experiment.
10. **Subjective probability** uses a probability value based on an educated guess or estimate, utilizing opinions and approximate information.
11. A **tree diagram** is a probability illustration that originates from a starting point, and has vertical “levels” for each trial displaying the possible outcomes for that level originating at each of the possible outcomes from the previous trial.
12. The set of all outcomes in a sample space that are NOT included in the event is the **complement**.

Work Problems—answer each question fully.

Tree Diagram:

13. Identify the sample space using a tree diagram to find all possible outcomes of flipping a dime, then picking a card to determine the suit (diamond, heart, spade, club), then flip a penny. Be sure to write out the sample space.



Sample Space:

$S = \{H\diamond H, H\diamond T, H\heartsuit H, H\heartsuit T, H\spadesuit H, H\spadesuit T, H\clubsuit H, H\clubsuit T, T\diamond H, T\diamond T, T\heartsuit H, T\heartsuit T, T\spadesuit H, T\spadesuit T, T\clubsuit H, T\clubsuit T\}$

Types of Probability—classify as an example of classical, empirical, or subjective probability.

14. Michelle buys a bag of candy and 16 out of the total 51 pieces of candy are blue.
empirical
15. Salvador has a $\frac{7}{13}$ probability of selecting a red card or a 7 out of the deck.
classical
16. After walking through the lunch room it appears that around 70% of the students purchase a school lunch. subjective

Probability Examples: Solve the following using the Addition Rule or Probability.

In a handful of Fruity O's cereal there are 4 blue, 6 orange, 3 green, 2 red, 4 yellow, and 5 purple.

17. Find $P(\text{not purple})$.

$$P(\text{not purple}) = \frac{19}{24}$$

19. Find $P(\text{orange})$.

$$P(\text{orange}) = \frac{6}{24}$$

18. Find $P(\text{blue or green})$.

$$P(\text{blue or green}) = \frac{4}{24} + \frac{3}{24} = \frac{7}{24}$$

20. Find $P(\text{orange or red or yellow})$.

$$P(\text{orange or red or yellow}) = \frac{6}{24} + \frac{2}{24} + \frac{4}{24}$$

Given a bag of marbles with 7 red marbles numbered 1-7 and 8 black marbles numbered 1-8 find:

21. $P(\text{less than 3 or greater than 5})$

$$P(\text{less than 3 or greater than 5}) = \frac{4}{15} + \frac{5}{15} = \frac{9}{15}$$

24. $P(\text{red or greater than 7})$

$$P(\text{red or greater than 7}) = \frac{7}{15} + \frac{1}{15} = \frac{8}{15}$$

22. $P(\text{black or greater than 6})$

$$P(\text{black or greater than 6}) = \frac{8}{15} + \frac{3}{15} - \frac{2}{15} = \frac{9}{15}$$

25. $P(\text{a 2 or a 6})$

$$P(\text{a 2 or a 6}) = \frac{2}{15} + \frac{2}{15} = \frac{4}{15}$$

23. $P(\text{even or less than 5})$

$$P(\text{even or less than 5}) = \frac{7}{15} + \frac{8}{15} - \frac{4}{15} = \frac{11}{15}$$

26. $P(\text{even or black})$

$$P(\text{even or black}) = \frac{7}{15} + \frac{8}{15} - \frac{4}{15} = \frac{11}{15}$$

Using a standard deck of cards find:

27. $P(\text{black or queen})$

$$P(\text{black or queen}) = \frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{38}{52}$$

29. $P(\text{face card or red})$

$$P(\text{face card or red}) = \frac{12}{52} + \frac{26}{52} - \frac{6}{52} = \frac{32}{52}$$

28. $P(\text{10 or Ace})$

$$P(\text{10 or Ace}) = \frac{4}{52} + \frac{4}{52} = \frac{8}{52}$$

30. $P(\text{10 or even})$

$$P(\text{10 or even}) = \frac{4}{52} + \frac{20}{52} - \frac{4}{52} = \frac{20}{52}$$

Complement: Picking a number from 1-15; $P(\text{multiples of 4})$

31. Find $P(E) =$ $P(\text{multiples of 4}) = \frac{3}{15}$

32. Find $P(E') =$ $P(\text{NOT multiples of 4}) = \frac{12}{15}$

33. What is $P(E) + P(E') =$ $\frac{3}{15} + \frac{12}{15} = \frac{15}{15} = 1$