

Name: _____

Date: _____

Review for Advanced Functions - Counting and Probability Quiz WS

Directions: Complete each problem. Show work in space provided. Box/Circle your final answer.

1. A 6-character password is formed by making the first and last character digits and the remaining characters letters. How many passwords can be created if the first and last can be repeated, but the remaining characters cannot be repeated? $10 \times 26 \times 25 \times 24 \times 23 \times 10 = 35,880,000$ passwords

2. Harry is choosing 4 library books from a selection of 11 books for a research paper. How many ways can Harry select the books? $11C_4 = 330$ ways

3. Karen is in charge of listing the first, second, and third place finishers in a race with 24 contestants on a bulletin board. How many different ways can she make the list? $24P_3 = 12,144$ ways

4. How many different ways can the word ARKANSAS be arranged?

5. Use the table below to complete the question:

Controlling Party	Number of States
Democrat	19
Republican	26
Split	4
Non-Partisan	1

If a state is chosen at random, what is the probability that it would be a state in which the Democratic party controls the state legislature?

6. A fruit basket contains 6 apples and 8 oranges. Sarah randomly selects one, puts it back, and then randomly selects another. What is the probability that both selections were oranges? $\frac{8}{14} \cdot \frac{8}{14} = \frac{64}{196} = 32.7\%$

7. An urn contains 5 red, 3 blue, and 4 yellow marbles. If 3 marbles are selected in succession, what is the probability of selecting blue, then yellow, and then blue, if no replacement occurs each time? $\frac{3}{12} \cdot \frac{4}{11} \cdot \frac{2}{10} = \frac{24}{1320} = 1.8\%$

8. A bag contains 12 pencils, 6 ball pens, and 2 sketch pens. Ronald takes out one writing object from this bag to note down some important information. What is the probability that a ball pen or a pencil is selected? $\frac{6}{20} + \frac{12}{20} = \frac{18}{20} = 90\%$

9. Each letter of the alphabet is written on a different piece of paper and put in a bag. One piece of paper is drawn at randomly from this bag. What is the probability of selecting a vowel or a letter from the word CLASSICAL?

10. A cookie tin contains 4 chocolate chip, 5 peanut butter, 6 sugar, and 2 coconut macaroon cookies. John selects four cookies at random. What is the probability that John selected two chocolate chip cookies and two sugar cookies? $\frac{4C_2 \cdot 6C_2}{17C_4} = \frac{6 \cdot 15}{2380} = \frac{90}{2380} = 3.8\%$

11. In Mr. Gram's class, 8 of the 18 girls are juniors, and 4 out of 12 boys are juniors. What is the probability of randomly selecting a girl or a junior in Mr. Gram's class? $\frac{18}{30} + \frac{12}{30} - \frac{8}{30} = \frac{22}{30} = 73.3\%$

12. There are 200 students at Smallville High School: 33% are freshmen, 25% are sophomores, 25% are juniors, and 17% are seniors. If two students are selected at random in succession, what is the probability that the choice would be a junior and then a senior?

Freshmen = $.33(200) = 66$

Sophomore = $.25(200) = 50$

Juniors = $.25(200) = 50$

Senior = $.17(200) = 34$

200 total

$\frac{50}{200} \cdot \frac{34}{199} = \frac{1700}{39800} = 4.3\%$