

Part B Questions

1. How many 4 character passwords can be made if the first three characters are lowercase letters and the last character must be a digit from 0 to 9? No characters can repeat.
2. In volleyball the starting lineup requires: one setter, two outside hitters, one opposite hitter and two middle blockers. A team has three setters, four outside hitters, two opposite hitters and five middle blockers. How many different starting lineups could be made?
3. For the following, indicate which action would involve using **permutations (P)** or **combinations (C)**.
 - a. Determining how many 4-digit phone numbers could start with the number 2
 - b. Choosing a group of 3 students to represent your school in a contest
 - c. Being dealt a hand of five cards that are all face cards
 - d. Guessing an 8-character password
4. How many different 3-letter arrangements can be made from the word "OYSTER"?
5. How many different ways can the letters of "AMERICAN" be arranged?



6. Amelia is hanging five photos in a row on her wall. Which of the following **does not** indicate how many photo arrangements are possible?
- a. ${}_5P_5$
 - b. 120
 - c. ${}_5C_5$
 - d. $5!$
7. ${}_nC_2 = 10$
Use algebra and the “choose” formula to solve for “n”.
8. In a play there are three roles for fairies and two roles for trolls. Six people audition to be fairies and seven people audition to be trolls. How many combinations of people could be cast?
9. Samira is playing a game where she has to guess the order of coloured tiles on a computer. There are four tiles: green, blue, red, and yellow. She knows that the second tile is yellow. How many possible arrangements does she have to guess from?
10. If repetition is permitted, how many different 4-digit phone numbers can be made using the digits 0-9. The phone number must start with the digit 2.



Part C Questions

1. From a survey, 17 out of 36 cats liked their bellies rubbed. What are the odds against a cat liking its belly rubbed?
2. There are three coloured balls in a hat: 12 red, 10 yellow and 13 green. If you draw one ball out what is the probability it will be green or yellow?
3. In Seattle, the probability of it raining on any given day is 41.6%. How many days on average does it rain a year? (Assume a standard 365 day year).
4. Josh is playing a solitaire card game. He is dealing himself a hand of four cards. Cards from Ace to 10 have a point value of their face value while face cards are each worth 1 point. He wants to have as low a point total as possible to start the game. He has dealt himself three cards already and needs to deal one more. He currently has an Ace, 8, 9 and a King. What is the probability his final 4-card hand will be worth more than 27 points?
5. Dmitry draws one card from a shuffled deck of 52 cards. What is the probability that card is a spade or an Ace?



6. Twelve grade 6 students and seven grade 7 students signed up for a field trip. There is only room for 5 students to go on the trip. To make it fair, five names will be drawn randomly. What is the probability that three grade 6 students and two grade 7 students will be chosen?

7. Prashanth has two different things for breakfast every day. His options are always oatmeal, an apple, an orange, a yogurt and toast. What is the probability one day that he will have oatmeal and then have an orange?

8. Pi rolls one regular six-sided dice and flips a coin. What is the probability she rolls something less than three and the coin lands on tails?

9. Pi is decorating her room. She is arranging her mouse toys on a shelf. She has one mouse in each colour of the rainbow. What is the probability that the blue and green mouse will end up beside each other? (Hint: watch the "Permutations" video lesson to start this problem).

10. Pi rolls two regular six-sided dice. What is the probability she rolls a sum of at least eleven?



PART B ANSWERS:

1. 156 000 passwords
2. 360 starting lineups
3. a) P b) C c) C d) P
4. 120
5. 20 160
6. C
7. $n = 5$
8. 420 combinations
9. 6 arrangements
10. 1000

PART C ANSWERS:

1. 19:17
2. 0.657 or 65.7%
3. 152 days a year
4. 0.146 or 14.6%
5. 0.308 or 30.8%
6. 0.397 or 39.7%
7. 0.05 or 5%
8. 0.167 or 16.7%
9. 0.286 or 28.6%
10. 0.972 or 97.2%

