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Combinations. (a)How many possible batting orders are there? If the two people are on the team then we only need to choosemore Permutations How many ordered arrangements of a;b;c are possible? is defined to beIn Example 1(b), you found the permutations ofobjects takenat a time Permutations and Combinations• Example: How many permutations are there ofWrite the answer using P(n, r) notation IThe number of r-combinations of a set with n elements is written C (n ;r) IC (n ;r) is often also written as n r, read''n choose r''. Notice that since we're choosing positions the order does not matter, since for example Instructor: Is l Dillig, CSH: Discrete Mathematics Permutations and Combinations/General Formula for Permutations with Repetition I P (n ;r) denotes number of r Permutations vs Combinations. Example A baseball (batting) lineup hasplayers. For any positive · · integer · n, the product of the integers fromto n is called factorial and is written as. The number of distinct combinations ofprofessors is The approach here is to divide the possibilities into two disjoint sets, those with the two people and those without. and. Use combinations if a problem calls for the number Find the probability that the soccer team is first and the chorus is second. I. n r is also called thebinomial coe cient. permutation is an arrangement with an order and the order is relevant. The permutation ABC is different to the permutation ACB. combination Choosing a subset of r elements from a set of n elements;Arranging the chosen elements. In the following sub Section, we shall obtain the formula needed to answer these questions immediatelyPermutations when all the objects are distinct TheoremThe number of permutations of n different objects taken r at a (n r)! In general, there are n! arrangements ofobjects. Using the nPr notation, from a set ofobjects we are choosingP 3! Each such arrangement is called apermutation. Referring to EXAMPLE above, Gomer is choosing and arranging a subset ofelements from a set ofelements, so we can get the answer quickly by using the permutation formula, letting n =and r = 9 There are∗∗= 3! =times. In the following sub For example, consider the following basic counting problems: How many ways can you order lunch from a choice ofsandwiches andbeverages? permutations of n distinct letters. In our list of sets ofprofessors, with order mattering, each set of three profs is counted 3! State if each scenario involves a permutation or a combination) A team ofbasketball players needs to choose a captain and co Use permutations if a problem calls for the number of arrangements of objects and different orders are to be counted. PERMUTATIONS AND COMBINATIONS DefinitionA permutation is an arrangement in a definite order of a number of objects taken some or all at a time. For instance, in a Permutations and Combinations. 3!= = = = 3! Answer!==abc; acb; bac; bca; cab; cba. As a special case, the value of 0! ITheorem: C (n ;r) = n r = n! 3! n! Instructor: Is l Dillig, CSH: Discrete Mathematics Permutations and Combinations 9/26 DefinitionA permutation is an arrangement in a definite order of a number of objects taken some or all at a time. n (n − 1) (n − 2)= · · · · · ·. A combination is a selection of objects in which order is not important. How many ways can you We need to choose two positions out of the ve and there are C(5; 2) ways to do this. r!