

## 11.6 In-class Practice

- The Fundamental Counting Principle says that if one event can occur in  $m$  ways and a second event can occur in  $n$  ways, then the two events can occur in order in  $\_\_\_ \times \_\_\_$  ways. So if you have two choices for shoes and three choices for hats, then the number of different shoe-hat combinations you can wear is  $\_\_\_ \times \_\_\_ = \_\_\_$ .
- A red die and a white die are rolled, and the numbers that show are recorded. How many different outcomes are possible?  

- Eight horses are entered in a race.
  - How many different orders are possible for completing the race?
  - In how many different ways can first, second, and third places be decided? (*assume no tie*)
- True or false?*
  - In counting combinations, order matters.
  - In counting permutations, order matters.
  - For a set of  $n$  objects, the number of different combinations of these objects is more than the number of different permutations.
  - If we have a set with five distinct object, then the number of different ways of choosing two members of this set is the same as the number of ways of choosing three members.
- Evaluate the expression.
  - $P(11,4)$
  - $C(11,4)$
  - $P(99,3)$
  - $C(99,3)$
- Without any calculations, explain the equation  $C(n, r) = C(n, n - r)$ .
- A pianist plans to play eight pieces at a recital. In how many ways can she arrange these pieces in the program?
- In how many ways can a president, vice president, secretary, and treasurer be chosen from a class of 30 students?
- In how many ways can seven students from a class of 30 be chosen for a trip?
- In how many ways can two blue marbles and four red marbles be arranged in a row?

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11. A class has 20 students, of whom 12 are females and 8 are males. In how many ways can a committee of five students be picked from this class under each condition?
- No restriction is placed on the number of males or females on the committee.
  - No males are to be included on the committee.
  - The committee must have three females and two males.