

10.8: Chapter Review

- Suppose of the 4,000 freshmen at a college everyone is enrolled in a mathematics or an English class during a given quarter. If 2,000 are enrolled in a mathematics class, and 3,000 in an English class, how many are enrolled in both a mathematics class and an English class?
- In a survey of 250 people, it was found that 125 had read Time magazine, 175 had read Newsweek, 100 had read U. S. News, 75 had read Time and Newsweek, 60 had read Newsweek and U. S. News, 55 had read Time and U. S. News, and 25 had read all three.
 - How many had read Time but not the other two?
 - How many had read Time or Newsweek but not the U. S. News And World Report?
 - How many had read none of these three magazines?
- At a manufacturing plant, a product goes through assembly, testing, and packing. If a plant has three assembly stations, two testing stations, and two packing stations, in how many different ways can a product achieve its completion?
- Six people are to line up for a photograph. How many different lineups are possible if three of them insist on standing next to each other?
- How many four-letter word sequences can be made from the letters of the word CUPERTINO?
- In how many different ways can a 20-question multiple choice test be designed so that its answers contain 2 A's, 4 B's, 9 C's, 3 D's, and 2 E's?
- The U. S. Supreme Court has nine judges. In how many different ways can the judges cast a six-to-three decision in favor of a ruling?
- In how many different ways can a coach choose a linebacker, a guard, and a tackle from five players on the bench, if all five can play any of the three positions?
- How many three digit even numbers can be formed from the digits 1, 2, 3, 4, 5 if no repetitions are allowed?
- Compute:
 - 9C_4
 - 8P_3
 - $\frac{10!}{4!(10-4)!}$
- In how many ways can 3 English, 3 Math, and 4 Spanish books be set on a shelf if the books are grouped by subject?
- In how many ways can a 10-question multiple choice test with four possible answers for each question be answered?
- On a soccer team three fullbacks can play any of the three fullback positions, left, center, and right. The three halfbacks can play any of the three halfback positions, the four forwards can play any of the four positions, and the goalkeeper plays only his position. How many different arrangements of the 11 players are possible?
- From a group of 6 people, 3 are assigned to cleaning, 2 to hauling and one to garbage collecting. How many different ways can this be done?
- How many three-letter word sequences can be made from the letters of the word OXYGEN?
- In how many ways can 3 books be selected from 4 English and 2 History books if at least one English book must be chosen?
- Five points lie on the rim of a circle. Choosing the points as vertices, how many different triangles can be drawn?
- A club consists of six men and nine women. In how many ways can a president, a vice president and a treasurer be chosen if the two of the officers must be women?
- Of its 12 sales people, a company wants to assign 4 to its Western territory, 5 to its Northern territory, and 3 to its Southern territory. How many ways can this be done?
- How many permutations of the letters of the word OUTSIDE have consonants in the first and last place?
- How many distinguishable permutations are there in the word COMMUNICATION?
- How many five-card poker hands consisting of the following distribution are there?
 - A flush(all five cards of a single suit)
 - Three of a kind(e.g. three aces and two other cards)
 - Two pairs(e.g. two aces, two kings and one other card)
 - A straight(all five cards in a sequence)
- Company stocks on an exchange are given symbols consisting of three letters. How many different three-letter symbols are possible?
- How many four-digit odd numbers are there?

25. In how many ways can 7 people be made to stand in a straight line? In a circle?
26. A United Nations delegation consists of 6 Americans, 5 Russians, and 4 Chinese. Answer the following questions.
 - a. How many committees of five people are there?
 - b. How many committees of three people consisting of at least one American are there?
 - c. How many committees of four people having no Russians are there?
 - d. How many committees of three people have more Americans than Russians?
 - e. How many committees of three people do not have all three Americans?
27. If a coin is flipped five times, in how many different ways can it show up three heads?
28. To reach his destination, a man is to walk three blocks north and four blocks west. How many different routes are possible?
29. All three players of the women's beach volleyball team, and all three players of the men's beach volleyball team are to line up for a picture with all members of the women's team lined together and all members of men's team lined up together. How many ways can this be done?
30. From a group of 6 Americans, 5 Japanese and 4 German delegates, two Americans, two Japanese and a German are chosen to line up for a photograph. In how many different ways can this be done?
31. Find the fourth term of the expansion $(2x - 3y)^8$.
32. Find the coefficient of the a^5b^4 term in the expansion of $(a - 2b)^9$.

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