

1. How many bit strings are there of length eight?
2. How many positive integers between 50 and 100 are divisible by 7 or 11?
3. A multiple-choice test contains 10 questions. There are four possible answers for each question.
 - a) In how many ways can a student answer the questions on the test if the student answers every question?
 - b) In how many ways can a student answer the questions on the test if the student can leave answers blank?
4. A professor writes 20 true/false questions. Of these 12 are true. If the questions can be positioned in any order, how many different answer keys are possible?
5. In how many ways can a photographer at a wedding arrange six people in a row, including the bride and groom if
 - a) the bride must be next to the groom?
 - b) the bride is positioned somewhere to the left of the groom?
6. How many bit strings are palindromes?

QUESTION BANK ON COUNTING TECHNIQUES

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7. How many students must be in a class to guarantee that at least two students receive the same score on the final exam, if the exam is graded on a scale from 0 to 100 pts?
8. A drawer contains a dozen of brown socks and a dozen black socks, all mismatched. A man takes socks out at random in the dark. How many socks must he take out to be sure that he has at least two socks of the same colour?
9. Suppose that a password for a computer system must have exactly 8 characters, where each character in the password is a lowercase English letter, an uppercase English letter, a digit, or any one of the four special characters $*$, $<$, $>$, $+$. How many different passwords are available for this system?
10. Each coefficient of the equation $ax^2+bx+c=0$ is determined by throwing an ordinary die. Find the number of equations that will have real roots.