

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?

9. How many different three-letter initials are there that begin with an A?

11. How many bit strings of length ten both begin and end with a 1?

25. How many strings of three decimal digits
 - a) do not contain the same digit three times?
 - b) begin with an odd digit?
 - c) have exactly two digits that are 4s?

29. How many license plates can be made using either two uppercase English letters followed by four digits or two digits followed by four uppercase English letters?

33. How many strings of eight English letters are there
 - a) that contain no vowels, if letters can be repeated?
 - b) that contain no vowels, if letters cannot be repeated?
 - c) that start with a vowel, if letters can be repeated?
 - d) that start with a vowel, if letters cannot be repeated?
 - e) that contain at least one vowel, if letters can be repeated?
 - f) that contain exactly one vowel, if letters can be repeated?
 - g) that start with X and contain at least one vowel, if letters can be repeated?
 - h) that start and end with X and contain at least one vowel, if letters can be repeated?

35. How many one-to-one functions are there from a set with five elements to sets with the following number of elements?

a) 4	b) 5	c) 6	d) 7
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37. How many functions are there from the set $\{1, 2, \dots, n\}$, where n is a positive integer, to the set $\{0, 1\}$
- a) that are one-to-one?
 - b) that assign 0 to both 1 and n ?
 - c) that assign 1 to exactly one of the positive integers less than n ?
41. A **palindrome** is a string whose reversal is identical to the string. How many bit strings of length n are palindromes?
47. How many ways are there to seat six people around a circular table where two seatings are considered the same when everyone has the same two neighbors without regard to whether they are right or left neighbors?
49. 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 not next to the groom?
 - c) the bride is positioned somewhere to the left of the groom?
51. How many bit strings of length 10 either begin with three 0s or end with two 0s?
65. Use the principle of inclusion–exclusion to find the number of positive integers less than 1,000,000 that are not divisible by either 4 or by 6.
67. How many ways are there to arrange the letters a, b, c , and d such that a is not followed immediately by b ?