

Throughout we use both the notations $\binom{n}{r}$ and C_r^n for the number $\frac{n!}{(n-r)!r!}$.

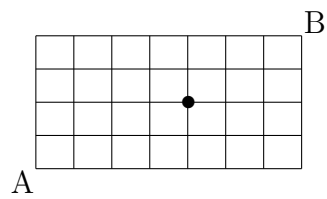
- How many paths consisting of a sequence of horizontal and/or vertical line segments with each segment connecting a pair of adjacent letters in the diagram below, is the word **CONTEST** spelled out as the path is traversed from beginning to end?

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          C
        C O C
      C O N O C
    C O N T N O C
  C O N T E T N O C
C O N T E S E T N O C

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- Recall that a Yahtzee Roll is a roll of five indistinguishable dice.
 - How many different Yahtzee Rolls are possible?
 - How many Yahtzee Rolls have exactly 3 different numbers showing?
- How many numbers can be expressed as a sum of three distinct members of the set $\{4, 5, 6, 7, 8, 9, 10, 11, 12\}$?
- Let $S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$.
 - How many five element subsets does the set have?
 - How many subsets of S have an odd number of members?
 - How many subsets of S have 1 as a member?
 - How many subsets have 1 as a member and do not have 2 as a member?
- Imagine that the 4×7 grid of squares below represents the streets of a part of the city where you live. You must walk 11 blocks to get from the lower left corner at A to the upper right corner at B.
 - How many different 11 block walks are there?
 - How many 11 block walks avoid the terrible corner marked with the bullet?
 - How many 11 block walks go through the terrible corner?
 - How many different 12 block walks are there from A to B?
 - How many different 13 block walks are there from A to B?



6. How many four-digit numbers have the property that the sum of the first three digits is the fourth digit. For example 1247 has the property.
7. How many numbers in the set $\{100, 101, 102, \dots, 999\}$ have a sum of digits equal to 9? B. How many four digit numbers have a sum of digits 9? C. How many integers less than one million have a sum of digits equal to 9?
- November 14, 2005 2:37 P.M.**