

INDEX CARD #13 (BACK & FRONT)

PROBABILITY

THEORETICAL PROBABILITY - $\frac{\text{What you want}}{\text{Total possibilities}}$

IF OR $P(A) + P(B) - P(A \text{ AND } B)$ —HAPPENING AT THE SAME TIME)

COMBINATION — FINDING THE NUMBER OF EVENTS WHEN THE ORDER DOES NOT MATTER (YOU DO NOT GET A DIFFERENT ARRANGEMENT)

EX. COMMITTEES, TOPPINGS ON PIZZA

PERMUTATION — FINDING THE NUMBER OF EVENTS WHEN THE ORDER DOES MATTER (YOU DO GET A DIFFERENT ARRANGEMENT)

EX. WINNING A RACE, MAKING WORDS WHEN ALL OF THE LETTERS ARE NOT USED

USE SLOTS FOR LICENSE PLATES, ETC.

FACTORIAL — MAKING WORDS WHEN ALL OF THE LETTERS ARE USED
OF LETTERS!

**** DO NOT FORGET TO DIVIDE BY THE NUMBER OF TIMES EACH LETTER IS REPEATED INDIVIDUALLY!****

BERNOULLI'S PRINCIPLE: USED WITH EXACTLY, AT MOST, AT LEAST

$${}_N C_R P^R Q^{N-R}$$

N = TOTAL TRIALS

R = WHAT YOU WANT — COMES AFTER THE KEY WORD EXACTLY, AT MOST, AT LEAST

P = PROBABILITY OF GETTING WHAT YOU WANT

Q = PROBABILITY OF NOT GETTING WHAT YOU WANT (1 - P)

REMEMBER P AND Q DO NOT HAVE ANYTHING TO DO WITH N AND R

EXACTLY — THAT NUMBER ONLY

AT MOST — # DOWN TO 0

AT LEAST — # UP TO N FOR AT LEAST & AT MOST.... ADD THE PROBABILITIES

BINOMIAL THEOREM:

FORMULA: $(A + B)^N = {}_N C_0 A^N B^0 + {}_N C_1 A^{N-1} B^1 + {}_N C_2 A^{N-2} B^2 + \dots + {}_N C_N A^0 B^N$
1ST TERM 2ND TERM 3RD TERM FOLLOW PATTERN

FORMULA IS ON THE REFERENCE SHEET

N = THE POWER OF THE BINOMIAL

A = 1ST TERM OF THE BINOMIAL

B = 2ND TERM OF THE BINOMIAL

IF YOU ARE LOOKING FOR A SPECIFIC TERM:

****THE VALUE OF R IS ALWAYS ONE LESS THAN THE TERM THAT YOU WANT ****

THE TOTAL NUMBER OF TERMS IS ALWAYS ONE MORE THAN THE POWER OF THE BINOMIAL