Honors Algebra II

Notes Section 6.1

Use Combinations and the Binomial Theorem

Combination: a selection of objects (r) from a group (n) where the order is NOT important.

$$ {}_nC_r = \frac{n!}{(n-r)! \cdot r!} $$

EXAMPLE 1 Evaluate.

a) $5!$ _____

b) $(4-2)!3!$ _____

c) $\frac{8!}{5!}$ _____

EXAMPLE 2 A standard deck of 52 playing cards has 4 suits with 13 different cards in each suit.

a) If the order in which the cards are dealt is not important, how many different 5-card hands are possible?

b) In how many 5-card hands are all 5 cards If the same color?

Multiple Events: I. Event A "and" Event B occur . . . MULTIPLY

II. Event A "or" Event B occur . . . ADD

EXAMPLE 3 William Shakespeare wrote 38 plays that can be divided into 3 genres. Of the 38 plays, 18 are comedies, 10 are histories, and 10 are tragedies.

a) How many different sets of exactly 2 comedies and 1 tragedy can you read?

b) How many different sets of at most 3 plays can you read?

EXAMPLE 4 During the school year, the girl's basketball team is scheduled to play 12 home games. You want to attend at least 3 of the games. How many different combinations of games can you attend?

Pascals Triangle:

Binomial Theorem (Binomial Expansion): _____

_____

_____

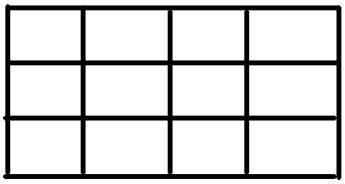
_____

_____

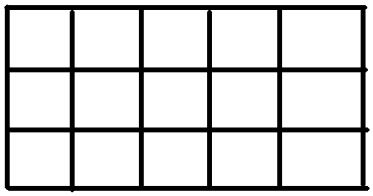
EXAMPLE 5 The 6 members of a Model UN club must choose 2 representatives to attend a state convention. Use Pascal's triangle to find the number of combinations of 2 members that can be chosen as representatives.

EXAMPLE 6 Write the Binomial Expansion.

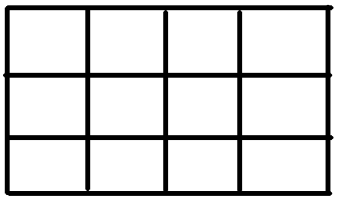
a) $(x^2 + y)^3$



b) $(a + 2b)^4$



c) $(5 - 2y)^3$



EXAMPLE 7 Find the coefficient of x^4 in the expression of $(3x + 2)^{10}$.