Binomial Expansion:

Notice the patterns:

1. In each expansion there are terms.
2. In successive terms the powers of *x* decrease by 1 and the powers of *y* increase by 1.
3. The sum of the powers in always *n*.
4. The coefficients are symmetrical.

**The Binomial Theorem** – in the expansion of

The coefficient of is we also use instead of

Ex.

Ex. =

key on calculator

Ex.

**Pascal’s Triangle** 1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

1 6 15 20 15 6 1

**Binomial Expansion (using Pascal’s Triangle)**

Ex. Write the expression for

Ex. Write the expansion for

Ex. Write the expansion for

Ex. Write the expansion for

Ex. Write the expansion for

**Finding the *k*th term in a Binomial Expansion**

The *k*th term in the binomial expansion of is:

Ex. Find the 6th term of

Ex. Find the 4th term of

Ex. Find the coefficient of the term in the expansion of

**Applications**

Ex. Expand

Ex. The probability of a baseball player getting a hit is 1 out of 4 ( or ).

Find the probability that the player gets 6 hits in the next 10 at bats.

=

Ex. The probability of a girl baby is 50.9%. Find the probability that a family of 4 has exactly 3 girls.