

Precalculus Unit 12: 12.5 Notes

Binomial Theorem

Binomial: a polynomial with two terms

Look at the expansion of $(x + y)^n$ for several values of n .

$$(x + y)^0 = 1$$

$$(x + y)^1 = x + y$$

$$(x + y)^2 = x^2 + 2xy + y^2$$

$$(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$$

$$(x + y)^4 = x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4$$

What are some patterns?

Pascal's Triangle:

Examples:

1. $(y - 2)^4$

2. $(3r - 2s)^6$

3. $(x^2 + y^2)^4$

4. $(\sqrt{x} + 5)^4$

5. $(2 - 3i)^6$