

Section 11.7: The Binomial Theorem

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2:06 PM

suppose you were asked to expand $(x+y)^8$

- the hard way: FOIL it out
- the easy way: technology
- the way we're going to do it
Pascal's triangle

$$(x+y)^8 = x^8 + \underline{\quad} x^7 y + \underline{\quad} x^6 y^2 + \underline{\quad} x^5 y^3 + \dots$$

sum of exponents = 8

$$\qquad\qquad\qquad + \underline{\quad} x y^7 + y^8$$

↑ ↑ ↑
but what are the coefficients?

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		
	1	7	21	35	35	21	7	1	
	1	8	28	56	70	56	28	8	1

$(x+y)^8$

so

$$(x+y)^8 = x^8 + 8x^7y + 28x^6y^2 + 56x^5y^3 + 70x^4y^4 + 56x^3y^5 + 28x^2y^6 + 8xy^7 + y^8$$