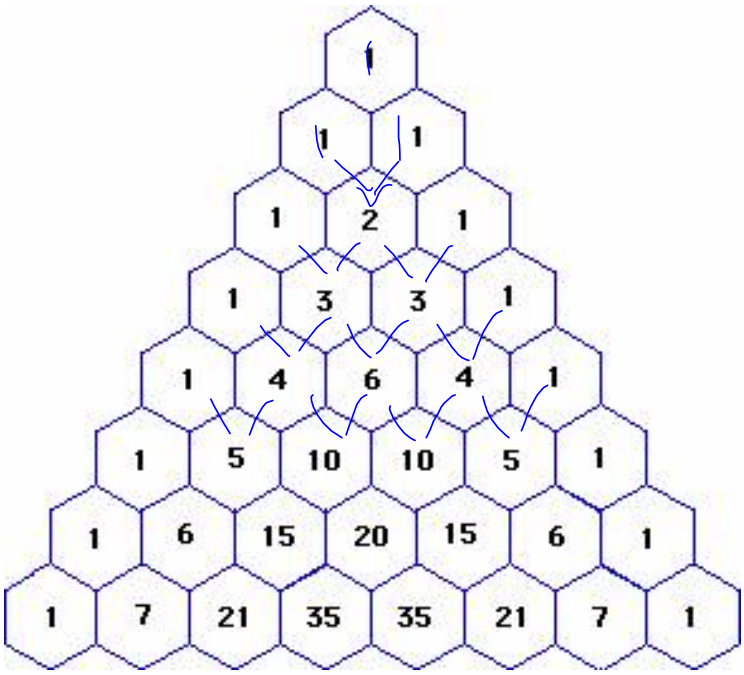
Pascal's Triangle



Investigate
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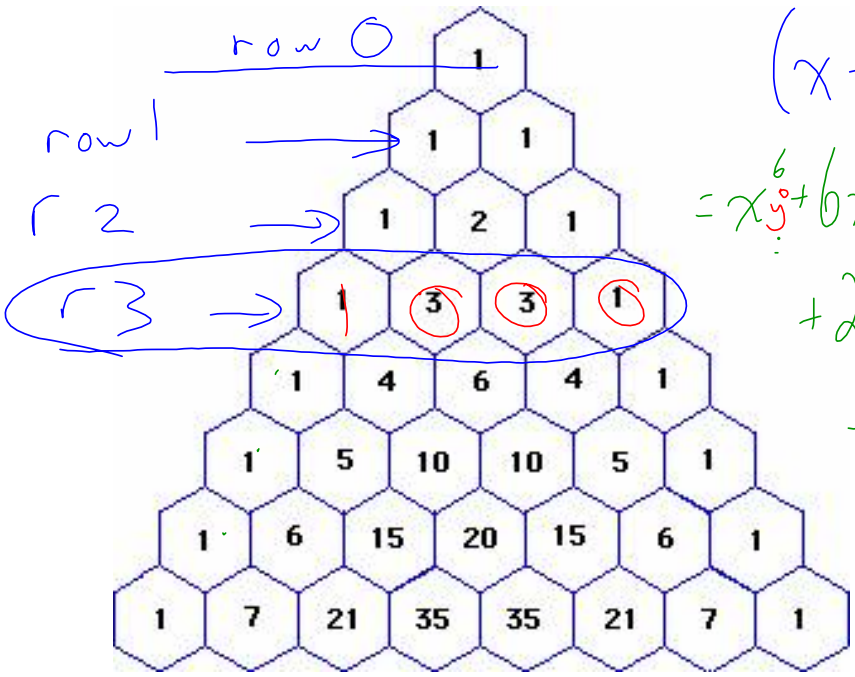
Pascal's Triangle - Binomial Expansion



$(x+y)^6$

$= x^6 + 6x^5y + 15x^4y^2 + 20x^3y^3 + 15x^2y^4 + 6xy^5 + y^6$

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

$$1(3x)^4(2y)^0 + 4(3x)^3(2y)^1 +$$

$$6(3x)^2(2y)^2 + 4(3x)^1(2y)^3 + 1(3x)^0(2y)^4$$

$$= 81x^4 + 108x^3y + 216x^2y^2 + 96xy^3 + 16y^4$$

r1 1 1

r2 1 2 1

r3 1 3 3 1

r4 1 4 6 4 1

1 5 10 10 5 1

$$(x+y)^3$$

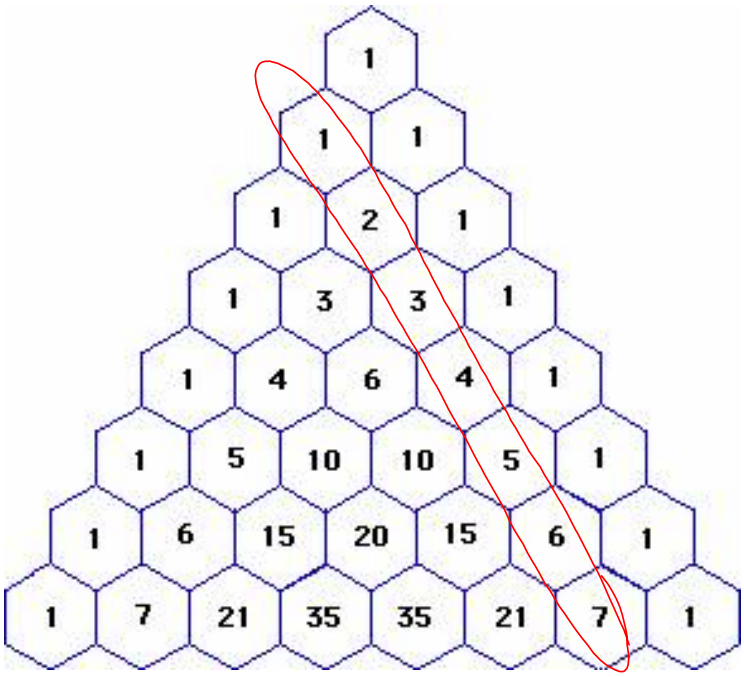
$$= (x+y)(x+y)(x+y)$$

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

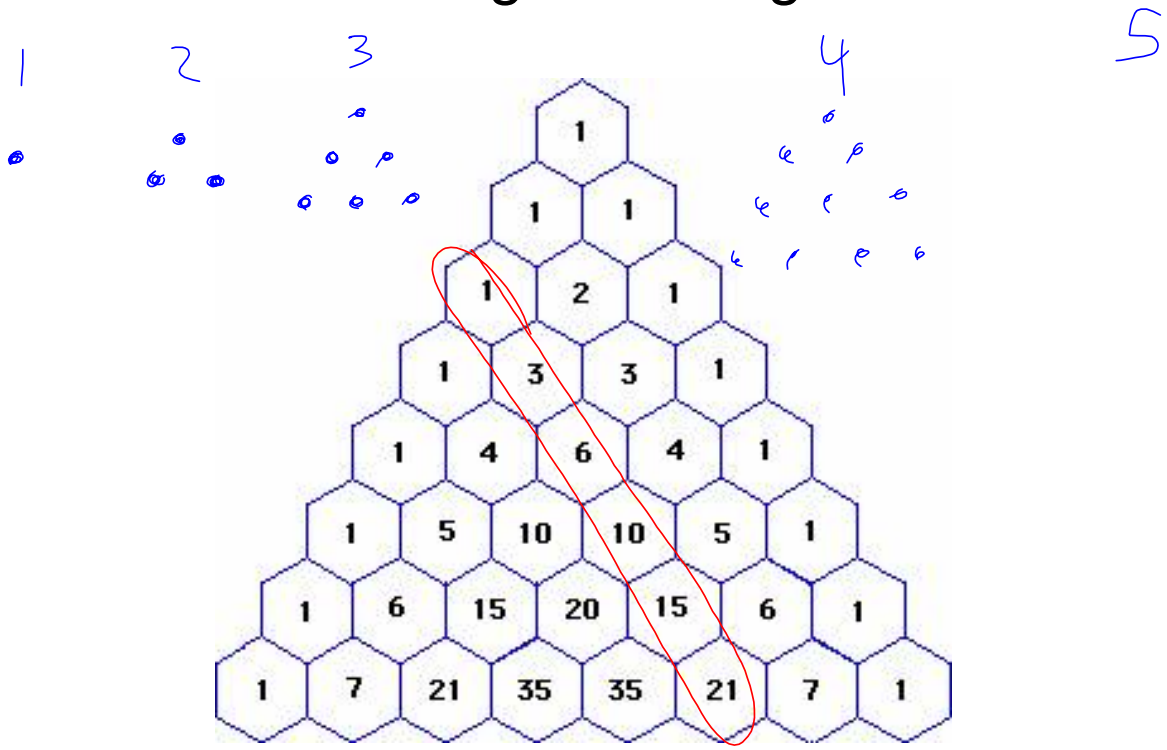
$$(x^3 + x^2y + 2x^2y + 2xy^2 + xy^2 + y^3)$$

$$+x^3 + 3x^2y + 3xy^2 + y^3$$

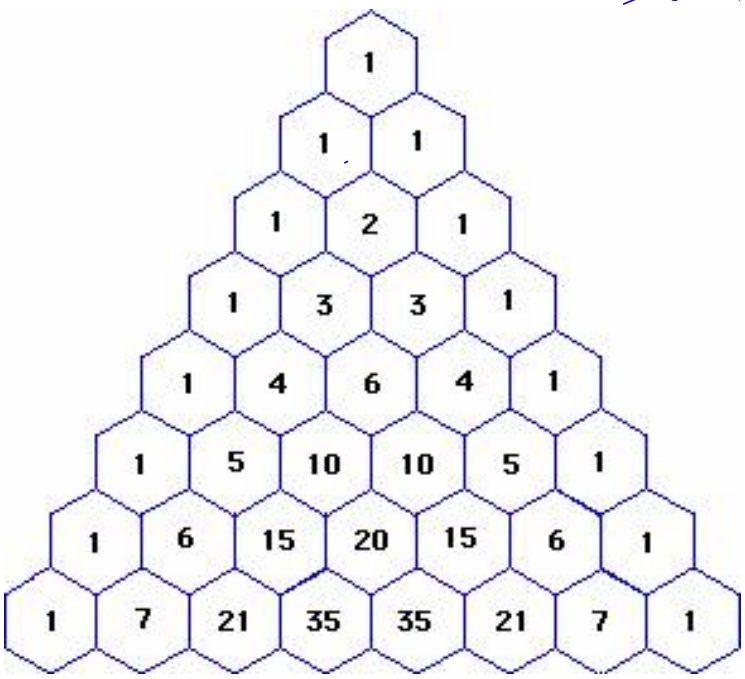
Pascal's Triangle - Counting Numbers



Pascal's Triangle - Triangle Numbers

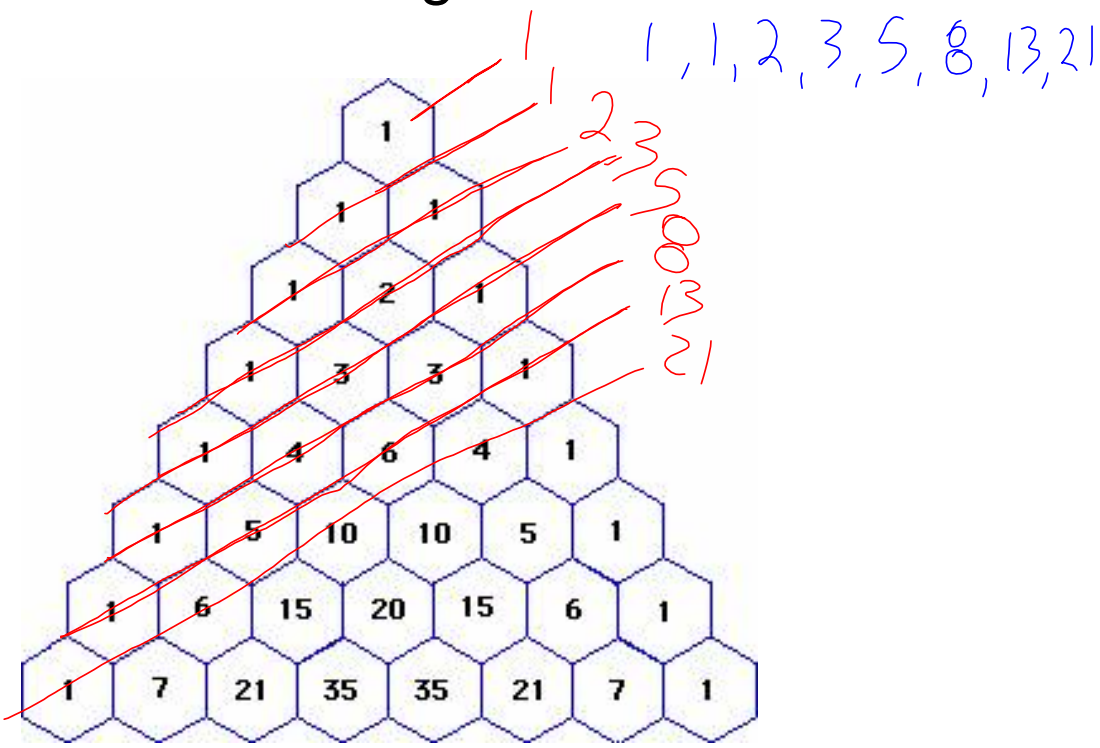


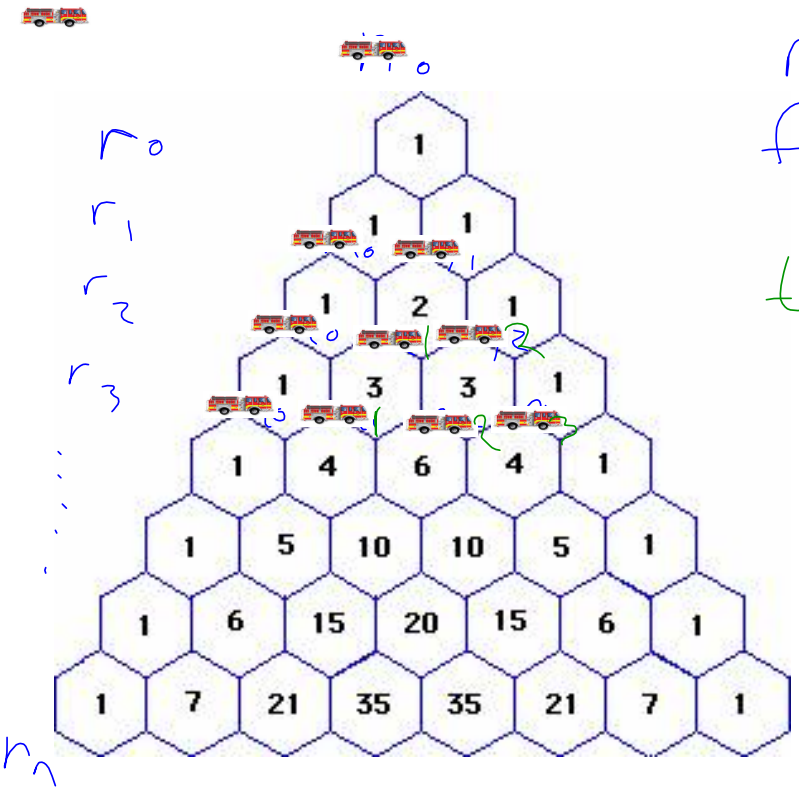
Pascal's Triangle - Powers of 2



Sum of Row	
1	2^0
2	2^1
4	2^2
8	2^3
16	2^4
32	2^5
64	2^6
128	2^7

Pascal's Triangle - Fibonacci





recursive formula

$t_{r,n} = t_{r-1,n-1} + t_{r-1,n}$

Golden Ratio

= 1.617.....

1 1 2 3 5 8 13 21

RATIOS 1 2 1.5 1.666 1.6 1.625 1.615

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