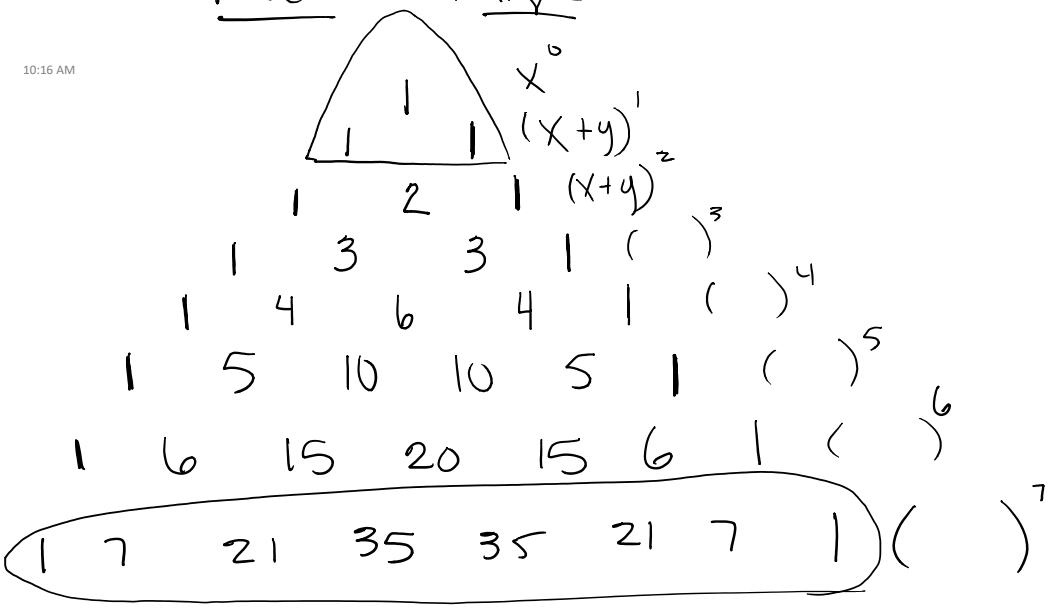
Thursday, December 14, 2017 10:16 AM

Pascal's triangle



Blaise

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

$$(2x+3)(2x+3)$$

FOIL

$$4x^2 + 6x$$
$$+ 6x + 9$$

$$4x^2 + 12x + 9$$

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

$$(2x+3)(2x+3)(2x+3)$$

$(2x+3)(4x^2+12x+9)$

$8x^3 + 24x^2 + 18x$

$+ 12x^2 + 36x + 27$

$8x^3 + 36x^2 + 54x + 27$

$(2x+3)^3$ Augghhh Torture!

Smarter way!

Wait. Back up.

$(2x+10y)^2$

$(2x+10y)(2x+10y)$

20xy

20xy

$4x^2 + 40xy + 100y^2$

important

x^2	x^1	x^0	
y^0	y^1	y^2	

Example.

$$(x+y)^7$$

	pascal's							
#	1	7	21	35	35	21	7	1
x	x^7	x^6	x^5	x^4	x^3	x^2	x^1	1
y	1	y^1	y^2	y^3	y^4	y^5	y^6	y^7

$$1x^7 + 7x^6y + 21x^5y^2 + 35x^4y^3 + 35x^3y^4 + 21x^2y^5 + 7xy^6 + 1y^7$$

$$(a+b)^4$$

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1 *

1	4	6	4	1
$(a)^4$	$(a)^3$	a^2	a^1	1
1	b^1	b^2	b^3	b^4

$$a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + 1b^4$$

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

1	4	6	4	1
$(2a)^4$	$(2a)^3$	$(2a)^2$	$(2a)^1$	$(2a)^0$
$1\,(-b)^0$	$(-b)^1$	$(-b)^2$	$(-b)^3$	$(-b)^4$
	$(4)(8)(-1)$	$6 \cdot 4 \cdot (-1)^2$	$4 \cdot 2 \cdot (-1)^3$	
$16a^4$	$-32a^3b$	$+\ 24a^2b^2$	$-8ab^3$	$+\ b^4$
+	−	+	−	+

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

1	5	10	10	5	1
$(3x)^5$	$(3x)^4$	$(3x)^3$	$(3x)^2$	$(3x)^1$	$(3x)^0$
$(-2y)^0$	$(-2y)^1$	$(-2y)^2$	$(-2y)^3$	$(-2y)^4$	$(-2y)^5$
$243x^5$	$-810x^4y$	$1080x^3y^2$	$10 \cdot 3^2 \cdot x^2 \cdot (-2)^3 \cdot y^3$	$240xy^4$	$-32y^5$

$43x^5$ $10x^4$ $x^{\frac{3}{2}}$ $10 \cdot 3^2 \cdot x^2 \cdot (-2)^3 \cdot y^3$ $40xy$ $32y^5$

$-720x^2y^3$

Homework

6.2 : 27-32; 41, 44, 47, 50*