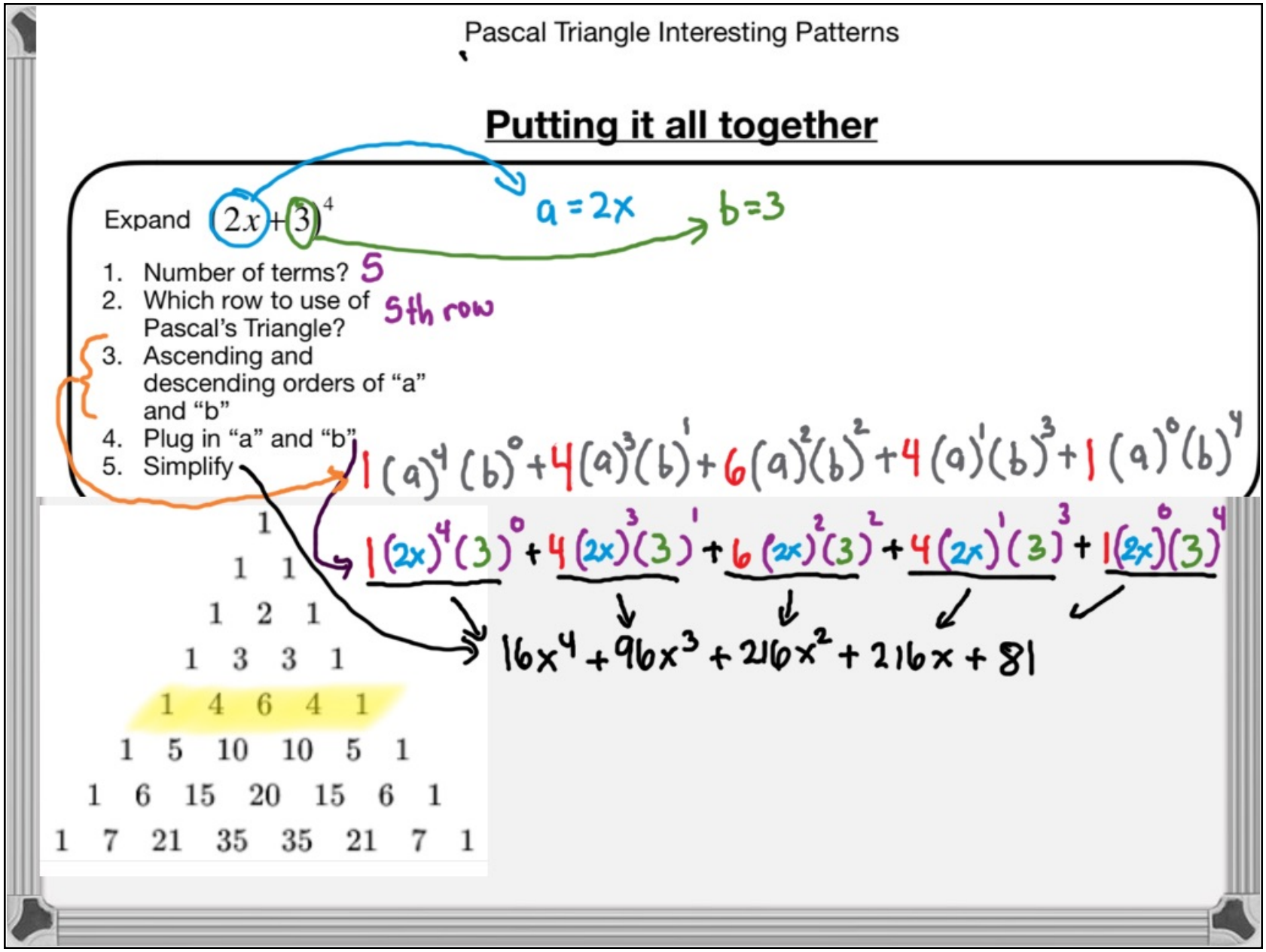
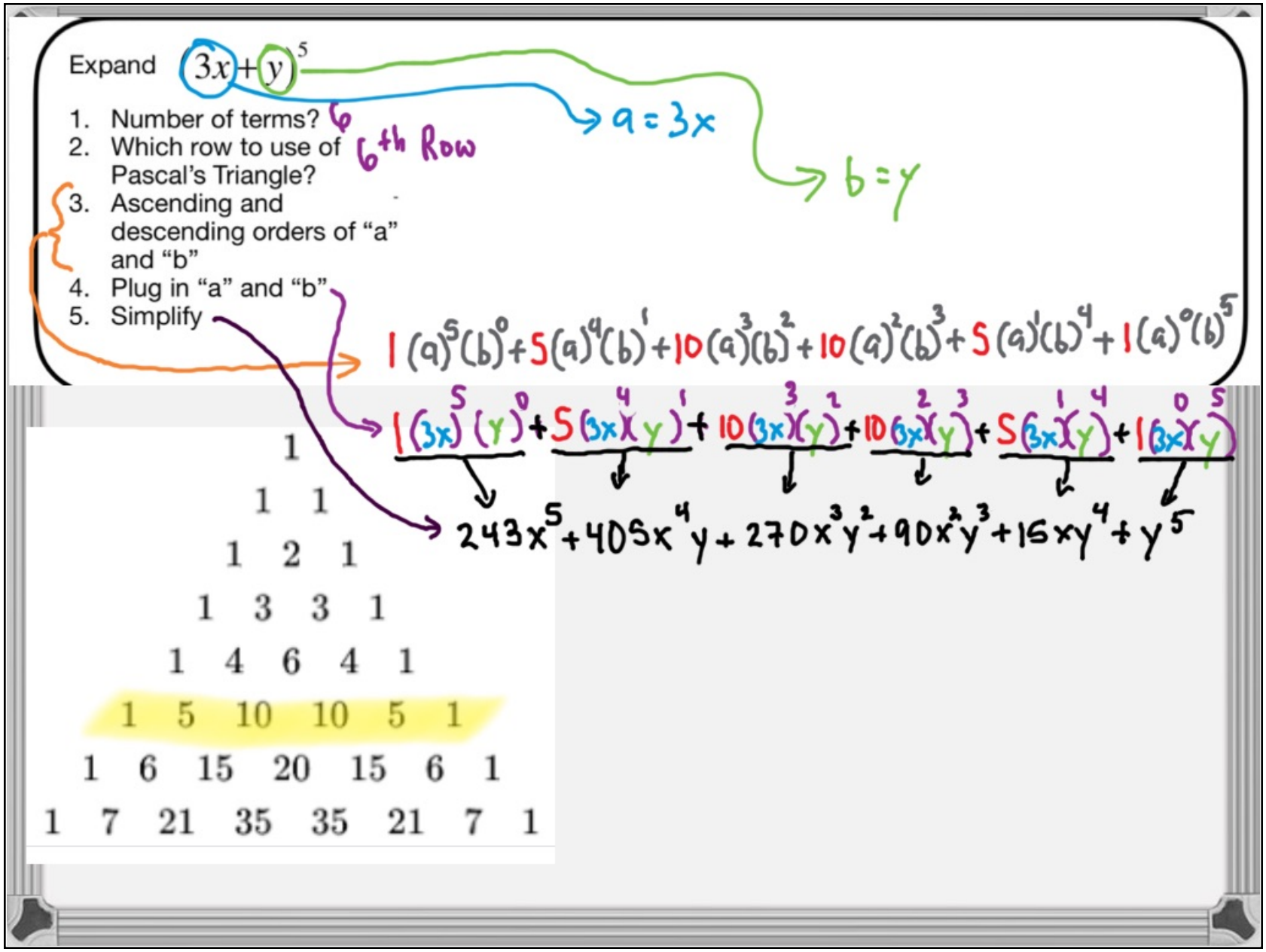
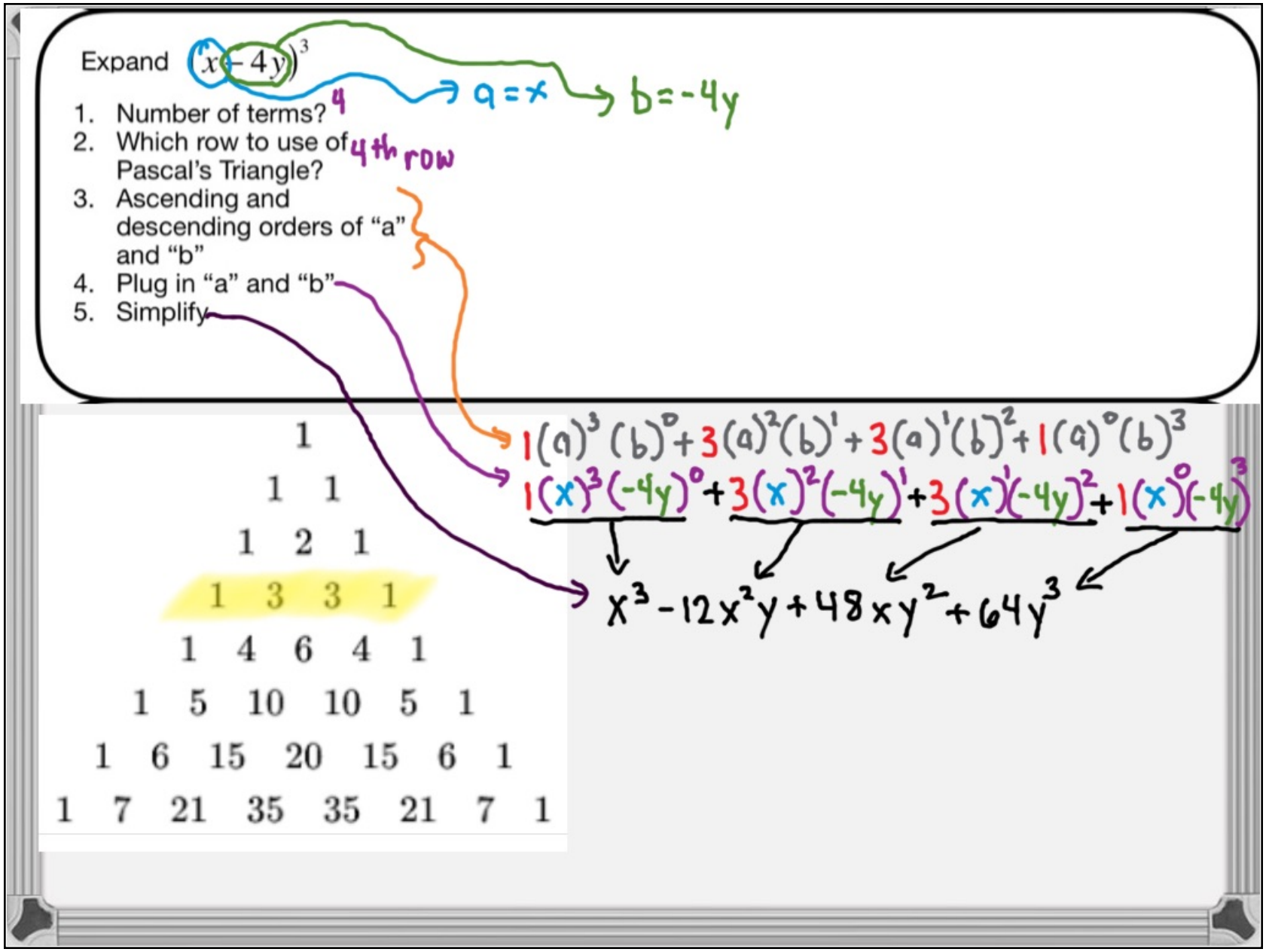
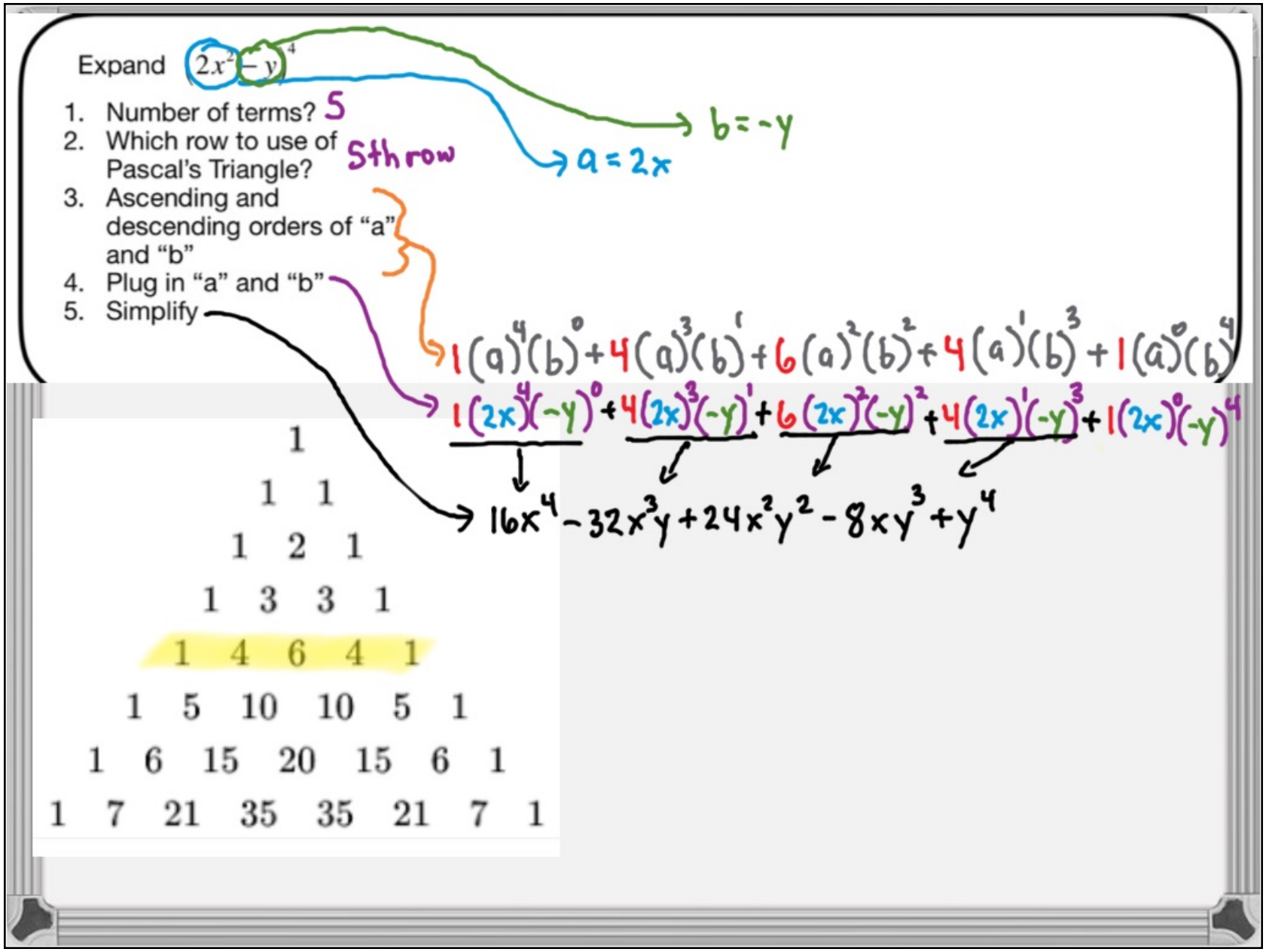

Pascal Triangle Interesting Patterns
Putting it all together
Expand $(2x+3)^4$
a = 2x
b = 3
1. Number of terms? 5
2. Which row to use of Pascal's Triangle? 5th row
3. Ascending and descending orders of "a" and "b"
4. Plug in "a" and "b"
5. Simplify
$1(a)^4(b)^0+4(a)^3(b)^1+6(a)^2(b)^2+4(a)^1(b)^3+1(a)^0(b)^4$
$1(2x)^4(3)^0+4(2x)^3(3)^1+6(2x)^2(3)^2+4(2x)^1(3)^3+1(2x)^0(3)^4$
$16x^4+96x^3+216x^2+216x+81$
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


Expand $(3x+y)^5$
1. Number of terms?
2. Which row to use of Pascal's Triangle?
3. Ascending and descending orders of "a" and "b"
4. Plug in "a" and "b"
5. Simplify
6th Row
a = 3x
b = y
$1(a)^5(b)^0+5(a)^4(b)^1+10(a)^3(b)^2+10(a)^2(b)^3+5(a)^1(b)^4+1(a)^0(b)^5$
$1(3x)^5(y)^0+5(3x)^4(y)^1+10(3x)^3(y)^2+10(3x)^2(y)^3+5(3x)^1(y)^4+1(3x)^0(y)^5$
$243x^5+405x^4y+270x^3y^2+90x^2y^3+15xy^4+y^5$
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


Expand $(x-4y)^3$
1. Number of terms? 4
2. Which row to use of Pascal's Triangle? 4th row
3. Ascending and descending orders of "a" and "b"
4. Plug in "a" and "b"
5. Simplify
a = x
b = -4y
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
$1(a)^3(b)^0+3(a)^2(b)^1+3(a)^1(b)^2+1(a)^0(b)^3$
$1(x)^3(-4y)^0+3(x)^2(-4y)^1+3(x)^1(-4y)^2+1(x)^0(-4y)^3$
$x^3-12x^2y+48xy^2+64y^3$


Expand $(2x^2 - y)^4$
1. Number of terms? 5
2. Which row to use of Pascal's Triangle? 5th row
3. Ascending and descending orders of "a" and "b"
4. Plug in "a" and "b"
5. Simplify
$b = -y$
$a = 2x$
$1(a)^4(b)^0 + 4(a)^3(b)^1 + 6(a)^2(b)^2 + 4(a)^1(b)^3 + 1(a)^0(b)^4$
$1(2x)^4(-y)^0 + 4(2x)^3(-y)^1 + 6(2x)^2(-y)^2 + 4(2x)^1(-y)^3 + 1(2x)^0(-y)^4$
$16x^4 - 32x^3y + 24x^2y^2 - 8xy^3 + y^4$
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