Expanding Binomials

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

$[(2x+4)(2x+4)](2x+4)$

$[4x^2+8x+8x+16](2x+4)$

$4x^2+16x+16\ (2x+4)$

$8x^3+16x^2+32x^2+64x+32x+64$

$8x^3+48x^2+96x+64$

* Shortcut * Pascal's Δ

```
                1                 row 0
              1   1               row 1
            1   2   1             row 2
          1   3   3   1           row 3
        1   4   6   4   1         row 4
      1   5   10  10  5   1       row 5
```

Same Example

1 3 3 1

$1(2x)^3 \quad 3(2x)^2 \quad 3(2x)^1 \quad 1(2x)^0$

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

$8x^3 \quad 4x^2 \quad 2x \quad 1$

$8x^3 + 48x^2 + 96x + 64$ MIND BLOWN!!

Example #2 $(x+y)^3$

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

Example #3 $(x+3y)^4$

Solution: $x^4+12x^3y+54x^2y^2+108xy^3+81y^4$

HOMEWORK: pg 418 #10–13 Long Way + #27–30 Either Way

#14–17 Pascal's Δ + ~~#31–34~~