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

In general: $(a + b)^n$

n = Row # in Pascals Triangle

n+1 = # terms in the expansion

$(a + b)^n = \_a^n + \_a^{n-1}b^1 + \_a^{n-2}b^2 + \ldots\ldots \_a^1b^{n-1} + \_b^n$

These coefficients are the numbers in Row n of Pascal's Triangle

Expand using Pascal's Triangle. $(m + 3)^4$

1st: This will have 4+1 = 5 terms so put 5 spaces on the paper

____ + ____ + ____ + ____ + ____

2nd Put the numbers in Row 4 of Pascal's Triangle as coefficients of these 5 terms

1 ____ + 4 ____ + 6 ____ + 4 ____ + 1 ____

3rd Starting by putting m^4 in the first space and as you move to the right the exponents decrease by 1 each

$1m^4$ + $4m^3$ + $6m^2$ + $4m$ + 1

4th Starting by putting 3^4 in the last space and as you move to the left the exponents decrease by 1 each tir

$1m^4$ + $4m^3 \cdot 3$ + $6m^2 \cdot 3^2$ + $4m \cdot 3^3$ + $1 \cdot 3^4$

Last Simplify each term:

$m^4 + 12m^3 + 54m^2 + 108m + 81$

Expand using Pascal's Triangle. $(m - 3)^4$

If the original problem was $(m-3)^4$ only some signs would change in the answer. As it turns out, the signs will alternate between positive and negative.

$1 \cdot m^4 + 4 \cdot m^3 \cdot -3 + 6m^2 \cdot -3^2 +$

$4m \cdot -3^3 + 1 \cdot -3^4$

$m^4 - 12m^3 + 54m^2 - 108m + 81$

Expand using Pascal's Triangle.

1. $(w + 4)^5$

$1w^5 + 5w^4 \cdot 4 + 10w^3 \cdot 4^2 + 10w^2 \cdot 4^3$

$5w \cdot 4^4 + 1 \cdot 4^5$

$w^5 + 20w^4 + 160w^3 + 640w^2 + 1280w + 1024$

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

$1(3x)^4 + 4(3x)^3 2 + 6(3x)^2 \cdot 2^2 + 4(3x) \cdot 2^3 + 1 \cdot 2^4$

$81x^4 + 216x^3 + 216x^2 + 96x + 16$

Expand. $(5a - 2b)^5$

$1(5a)^5 - 5(5a)^4(2b) + 10(5a)^3(2b)^2 - 10(5a)^2(2b)^3 + 5 \cdot 5a(2b)^4 - 1 \cdot (2b)^5$

$3125a^5 - 6250a^4b + 5000a^3b^2 - 2000a^2b^3 + 400ab^4 - 32b^5$

You can now finish Hwk #33 Sec 6-8

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Problems 26-28, 34, 38, 46, 48, 50