N=0			1	
N=1			1	1
N=2			1	2	1
N=3		1	3	3	1
N=4		1	4	6	4	1
N=5	1	5	10	10	5	1

n=6 1 6 15 20 15 6 1

Advanced Algebra

Unit 7 Binomial Expansion Assignment #2

Evaluate the following Combinations:

1) $_{12}C_{10}$

$\frac{12!}{10!\,2!}$ $\frac{12\times11}{2}$ (66)

b) $_8C_5$ (56)

$\frac{8!}{(8-5)!\,5!}$ $\frac{8\cdot7\cdot6}{6}$

c) $_7C_5$

$\frac{7!}{2!\,5!}$ $\frac{7\times6}{2}$ (21)

d) $_6C_2$

e) $_{10}C_8$

$\frac{10!}{8!\,2!}$ $\frac{10\times9}{2}$ (45)

f) $_5C_3$

$\frac{5!}{2!\,3!}$ $\frac{5\times4}{2}$ (10)

g) $_9C_6$

$\frac{9!}{6!\,3!}$ $\frac{9\times8\times7}{6}$ (84)

h) $_7C_0$

$\frac{7!}{0!\,7!}$ (1)

2) Use your Pascals triangle from your notes to expand out $(a+b)^6$

$a^6 + 6a^5b + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6ab^5 + b^6$

3) Using the pattern $(a+b)^5 = a^5+5a^4b+10a^3b^2+10a^2b^3+5ab^4+b^5$ to expand $(2x+3)^5$

$a = 2x$

$b = 3$

$(2x)^5 + 5(2x)^4(3) + 10(2x)^3 3^2 + 10(2x)^2 3^3 + 5(2x)3^4 + 3^5$

$32x^5 + 240x^4 + 720x^3 + 1080x^2 + 810x + 243$

4) Given $(a+b)^8$, write down the 4th term

$a^8 + a^7b + a^6b^2 + a^5b^3 + a^4b^4$

Term: 1 2 3 4

$_8C_4$ $\frac{8!}{4!\,4!} = 70$

$70a^4b^4$

5) Expand $(2+x)^4$ and simplify

$2^4 + 4(2)^3x + 6(2)^2x^2 + 4(2)x^3 + x^4$

$16 + 32x + 24x^2 + 8x^3 + x^4$

$x^4 + 8x^3 + 24x^2 + 32x + 16$

1 4 6 4 1

6) Use your pascals triangle to expand $(3x+4)^4$

$(3x)^4 + 4(3x)^3 4 + 6(3x)^2 4^2 + 4(3x) 4^3 + 4^4$

$81x^4 + 432x^3 + 864x^2 + 768x + 256$

7) Find the 4th term of $(2x+4)^6$

${}_6C_4 (2x)^2 4^4$

$\frac{6!}{2!4!}$ $\frac{6\times5}{2}$ $15 \cdot 4x^2 \cdot 256$

#7 final answer

$15360x^2$

8) Find the 6th term of $(3x+4)^8$

${}_8C_6 (3x)^2 4^6$

$\frac{8!}{6!2}$ $\frac{8\times7}{2} = 28$ $28 \cdot 9x^2 \cdot 4096$

1032192

#8 Final answer

$1,032,192x^2$

9) Find the 5th term of $(4x+12)^8$

${}_8C_5 (4x)^3 12^5$

$\frac{8!}{5!3!}$ $\frac{8\times7\times6}{6}$ 56 $56 \cdot 64x^3 \cdot 248832$

#9 Final answer

$891,813,888x^3$

10) Find the 8th term of $(2x+4)^{10}$

${}_{10}C_8 (2x)^2 4^8$

$\frac{10!}{8!2!}$ $\frac{10\times9}{2} = 45$ $4x^2(65536)$

#10 Final answer

$11,796,480x^2$