Algebra II
5.7 Binomial Expansion WS

Name _____
Period_____ Date_____

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

Expand each binomial.

1. $(x + 2)^4$

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

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

2. $(n - 3)^3$

$(n)^3+3(n)^2(-3)+3(n)(-3)^2+(-3)^3$

$n^3-9n^2+27n-27$

3. $(2a + 2)^2$

$1(2a)^2+2(2a)(2)+1(2)^2$

$4a^2+8a+4$

4. $(x^2 - y^2)^4$

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

$x^8-4x^6y^2+6x^4y^4-4x^2y^6+y^8$

5. $(2x + 3y)^3$

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

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

Find the specified term of each binomial expansion.

6. third term of $(x - 2y)^5$

$10(x)^3(-2y)^2$

$40x^3y^2$

7. second term of $(x^2 + y^2)^3$

$3(x^2)^2(y^2)^1$

$3x^4y^2$

8. fourth term of $(x^2 - 2y)^4$

$4(x^2)^1(-2y)^3$

$-32x^2y^3$

9. The term $126c^4d^5$ appears in the expansion of $(c + d)^n$. What is n?

b/c $4+5=9$

$n=9$

10. The coefficient of the second term in the expansion of $(r + s)^n$ is 7. Find the value of n, and write the complete term.

Row 7 b/c outside #'s always equal row

$n=7$

$7(r)^6s^1$ → $7r^6s$

11. Use Pascal's Triangle to determine the binomial of the expanded expression
$x^6 + 6x^5 + 15x^4 + 20x^3 + 15x^2 + 6x + 1$.

$(x+1)^6$

12. Error Analysis Your friend expands the binomial $(x - 2)^6$ as
$x^6 + 12x^5 + 30x^4 + 160x^3 + 240x^2 + 192x + 64$. What mistake did your friend make? What is the correct expansion?

Did not take in consideration "-2"

$1(x)^6+6(x^5)(-2)+15(x)^4(-2)^2+20x^3(-2)^3+15(x)^2(-2)^4+6(x)(-2)^5+1(-2)^6$

$x^6-12x^5+60x^4-180x^3+240x^2-192x+64$