

The Binomial Theorem

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Find each coefficient described.

1) Coefficient of  $x^2$  in expansion of  $(2+x)^5$

$$10(2)^3 x^2 = 80$$

2) Coefficient of  $x^2$  in expansion of  $(x+2)^5$

$$10(x)^2(2)^3 = 80$$

3) Coefficient of  $x$  in expansion of  $(x+3)^5$

$$5x(3)^4 = 405$$

4) Coefficient of  $b$  in expansion of  $(3+b)^4$

$$4(3)^3 b^1 = 108$$

5) Coefficient of  $x^3 y^2$  in expansion of  $(x-3y)^5$

$$10(x)^3(-3y)^2 = 90$$

6) Coefficient of  $a^2$  in expansion of  $(2a+1)^5$

$$10(2a)^2(1) = 40$$

Find each term described.

7) 2nd term in expansion of  $(y-2x)^4$

$$4(y^3)(-2x)^1 = -8y^3x$$

8) 4th term in expansion of  $(4y+x)^4$

$$4(4y)(x)^3 = 16x^3y$$

9) 1st term in expansion of  $(a+b)^5$

$$a^5$$

10) 2nd term in expansion of  $(y-x)^4$

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

Expand completely.

11)  $(2m-1)^4$

$$16m^4 - 32m^3 + 24m^2 - 8m + 1$$

12)  $(x-y)^3$

$$x^3 - 3x^2y + 3xy^2 - y^3$$

13)  $(x^4-y)^5$

$$x^{20} - 5x^{16}y + 10x^{12}y^2 - 10x^8y^3 + 5x^4y^4 - y^5$$

14)  $(2x^3+1)^5$

$$32x^{15} + 80x^{12} + 80x^9 + 40x^6 + 10x^3 + 1$$

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

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

16)  $(y^3-4x)^3$

$$y^9 - 12y^6 + 48y^3x^2 - 64x^3$$