

## Notes Section 10.5 - the binomial theorem

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	

• expand

1.  $(x+2)^4 =$

$$1x^4 + 4x^3(2)^1 + 6x^2(2)^2 + 4x(2)^3 + 1(2)^4$$
$$x^4 + 8x^3 + 24x^2 + 32x + 16$$

2.  $(x-2y)^6$

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

$$x^6 - 12x^5y + 60x^4y^2 - 160x^3y^3 + 240x^2y^4$$
$$- 192xy^5 + 64y^6$$

3. find the coefficient of the fourth term of  $(a-b)^7$

$${}^7C_3 = \frac{7!}{4!3!} = \boxed{35}$$

4. find the coefficient of the  $x^3y^5$  term in the expansion of  $(2x-3y)^8$

$${}^8C_5 = 56 \quad 56(2x)^3(-3y)^5$$

$$\boxed{-108,864}$$