

$$(\underline{x^3} + \underline{y^2})^6$$

$$x^{18} + 6x^{15}y^2 + 15x^{12}y^4 + 20x^9y^6 + 15x^6y^8 + 6x^3y^{10} + y^{12}$$

$$\begin{array}{cccccccc} | & (x^3)^6 & (y^2)^0 & 6(x^3)^5 & (y^2)^1 & 15(x^3)^4 & (y^2)^2 & 20(x^3)^3 & (y^2)^3 & 15(x^3)^2 & (y^2)^4 & 6(x^3)^1 & (y^2)^5 & (x^3)^0 & (y^2)^6 \\ & x^{18} & + & 6x^{15} & y^2 & + & 15x^{12} & y^4 & + & 20x^9 & y^6 & + & 15x^6 & y^8 & + & 6x^3 & y^{10} & + & y^{12} & (y^2)^6 \end{array}$$

Pascal's Triangle

of row
is exponent

$n=0$	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

$$(x+y)^0 = 1$$

$$(x+y)^1 = 1x + 1y$$

$$(x+y)^2 = 1x^2 + 2xy + 1y^2$$

$$(x+y)(x+y) \\ x^2 + 2xy + y^2$$

$$(\underline{x} + 3)^4 \quad (x+3)(x+3)(x+3)(x+3)$$

$$1x^4(3)^0 \quad 4x^3(3)^1 \quad 6x^2(3)^2 \quad 4x(3)^3 \quad 1x^0(3)^4$$

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

$$(2x - 3)^5$$

$$\begin{array}{ccccccccc} & & 5(16x^4)(-3) & 10 \cdot (8x^3)(9) & 10(4x^2)(-27) & 5(2x)(81) & & & \\ \boxed{1(2x)^5(-3)^0} & \boxed{5(2x)^4(-3)^1} & 10(2x)^3(-3)^2 & 10(2x)^2(-3)^3 & 5(2x)^1(-3)^4 & 1(2x)^0(-3)^5 & & & \end{array}$$

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

