

**Bell Work:**

1. Multiply  $4a^3b^2(7a^3 - 3a^2b + 2ab^2 - 8b^3)$ .

2. Multiply  $(2c - 7)(5c + 8)$ .

3. Multiply  $(5d + 2)(6d^2 - 4d - 9)$ .

4. Add  $(6e^3 - 7e - 9 + 15e^2) + (10e^2 - 4e^3 - 8)$ .

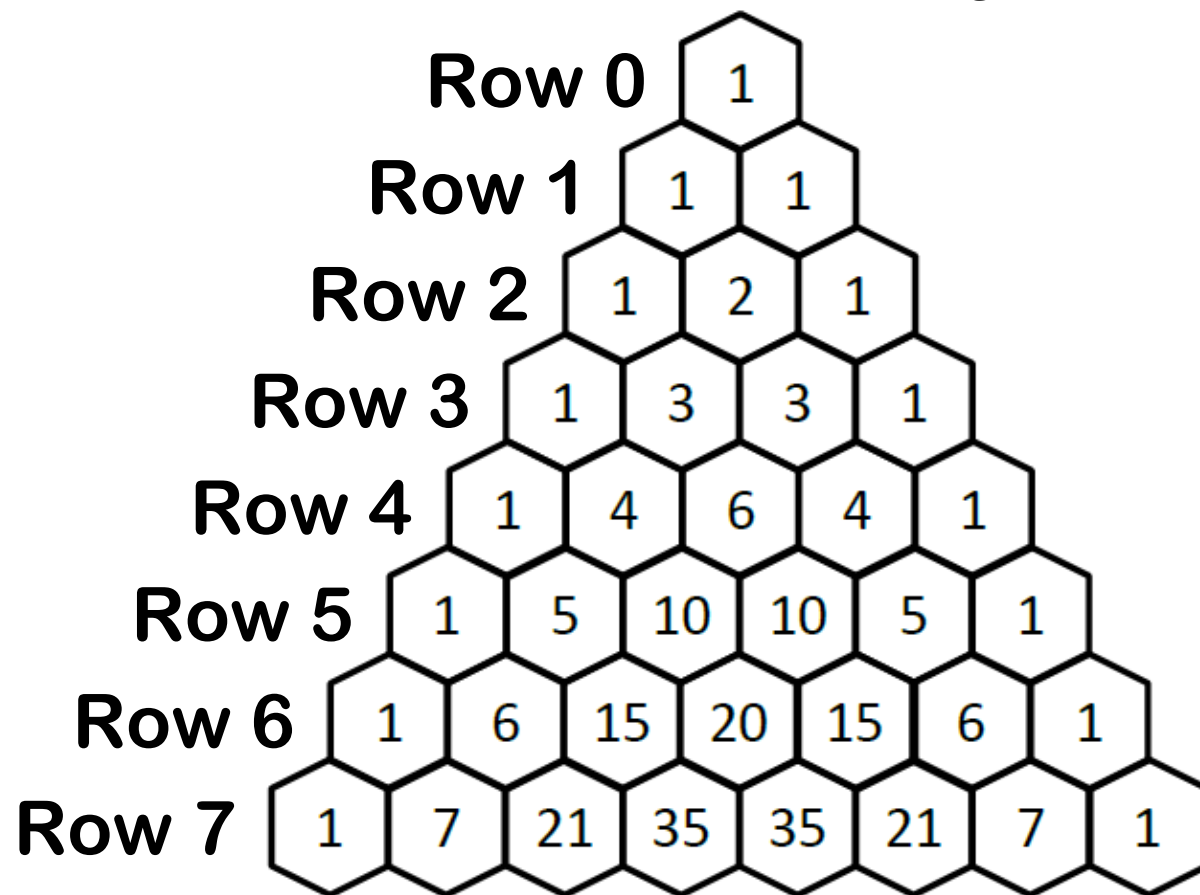
$$\begin{aligned} 1. \quad (y + 4)^3 &= \\ (y + 4)(y + 4)(y + 4) &= \\ (y^2 + 4y + 4y + 16)(y + 4) &= \\ (y^2 + 8y + 16)(y + 4) &= \\ y^3 + 4y^2 & \\ + 8y^2 + 32y & \\ + 16y + 64 & \\ \hline y^3 + 12y^2 + 48y + 64 & \end{aligned}$$

*There's a lot of multiplication for this problem.*

*Let's find an easier way.*

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

*Let's use Pascal's triangle.*



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

Row 4:

	1	4	6	4	1
$x$	$x^4$	$x^3$	$x^2$	$x^1$	$x^0$
$+ 2$	$2^0$	$2^1$	$2^2$	$2^3$	$2^4$
	$x^4$	$8x^3$	$24x^2$	$32x$	16

*Exponents go down by 1.*

*Exponents go up by 1.*

*Multiply down.*

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

5.  $(2x + 1)^6 =$

Row 6:

	1	6	15	20	15	6	1
$2x$	$(2x)^6$	$(2x)^5$	$(2x)^4$	$(2x)^3$	$(2x)^2$	$(2x)^1$	$(2x)^0$
$+1$	$(1)^0$	$(1)^1$	$(1)^2$	$(1)^3$	$(1)^4$	$(1)^5$	$(1)^5$
	$64x^6$	$192x^5$	$240x^4$	$160x^3$	$60x^2$	$12x$	1

*Exponents go down by 1.  
Exponents go up by 1.*

*Multiply down.*

$64x^6 + 192x^5 + 240x^4 + 160x^3 + 60x^2 + 12x + 1$

$$7. (y - x)^5 =$$

Row 5:

	1	5	10	10	5	1
$y$	$y^5$	$y^4$	$y^3$	$y^2$	$y^1$	$y^0$
$-x$	$(-x)^0$	$(-x)^1$	$(-x)^2$	$(-x)^3$	$(-x)^4$	$(-x)^5$
	$y^5$	$-5xy^4$	$10x^2y^3$	$-10x^3y^2$	$5x^4y$	$-x^5$

*Exponents go down by 1.*

*Exponents go up by 1.*

*Multiply down.*

$$y^5 - 5xy^4 + 10x^2y^3 - 10x^3y^2 + 5x^4y - x^5$$

### 10. 4th term in the expansion of $(y + 2)^7$

	<i>1<sup>st</sup></i>	<i>2<sup>nd</sup></i>	<i>3<sup>rd</sup></i>	<i>4<sup>th</sup></i>			
Row 7:	1	7	21	35			
<i>y</i>	$y^7$	$y^6$	$y^5$	$y^4$			
+ 2	$(2)^0$	$(2)^1$	$(2)^2$	$(2)^3$			

*Exponents go down by 1.  
Exponents go up by 1.*

$280y^4$  *Multiply down.*

**Assignment:**

**Binomial Expansion Worksheet**