

The Binomial Theorem

1. Given ${}_{19}C_k (2x)^v \left(-\frac{1}{4}\right)^5$, which is one term in the expansion of $\left(2x - \frac{1}{4}\right)^n$, what is the value of

i) k ? ii) v ? iii) n ? iv) the term # of ${}_{19}C_k (2x)^v \left(-\frac{1}{4}\right)^5$?

Use the following information to answer the next question.

Given $(a + b)^6$, consider the following statements.

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|-------------|---|
| Statement 1 | The total number of terms is 5. |
| Statement 2 | For the term, $20a^3b^m$, $m = 3$ |
| Statement 3 | The sum of the coefficients of all the terms is 64. |
| Statement 4 | If b is an integer, the constant term is $6b$. |

2. The 2 correct statements are ___ and ___.
3. In the expansion of $(2x - y^3)^{11}$, the coefficient of the term containing x^3y^{24} is
- a) 1320 b) -1320 c) 2480 d) -2480
4. The constant term in the expansion of $\left(5x^5 + \frac{1}{x^2}\right)^{14}$ can be written in the form, **abcabc**. The values of a , b , and c , are respectively, ____, ____, and ____.

5. Find the middle term of $\left(x^4 - \frac{1}{\sqrt{3x^2}}\right)^8$.

6. A term in the expansion of $(ax - 2y)^9$ is $-225\,792x^2y^7$. What is the value of a ?

7. Find the coefficient of the 3rd term of $(2x + \sqrt{2})^5$.

8. The 4th term of $\left(x - \frac{1}{2}\right)^n$ is $-15x^7$. Determine the value of n .

9. Which term number of $\left(x^2 - \frac{1}{x}\right)^6$ is the constant term? What is the value of this constant term?

Pascal's Triangle							Sum of Row				
			1				$2^0 = 1$				
		1		1			$2^1 = 2$				
		1		2		1	$2^2 = 4$				
	1		3		3		1	$2^3 = 8$			
	1		4		6		4		1	$2^4 = 16$	
1		5		10		10		5		1	$2^5 = 32$

10. a) Fill in the next row of Pascal's Triangle.

b) What is the sum of the 9th row?

c) Suppose a Pizza Restaurant advertized a number, which represents all the ways someone could build a pizza using at least 1 topping, to a maximum of 6 toppings. What is this number? Which row of the triangle would be closest to this number? Why is the row number slightly different from the advertized number?

11. The expansion of $(2x + 3)^{a-5}$ has 7 terms.

a) What is the value of a?

b) What is the coefficient of the 1st term?

c) What is the constant term?