

Binomial Theorem Cheat Sheet

Section		*Remarks
Introduction	<p>1. Binomial is about EXPANSION of expression.</p> <p>2. $(a+b)^n = a^n + \binom{n}{1}a^{n-1}b^1 + \binom{n}{2}a^{n-2}b^2 + \binom{n}{3}a^{n-3}b^3 + \dots$</p> <p>3. General Term: $T_{r+1} = \binom{n}{r}a^{n-r}b^r$</p> <p>4. Binomial Coefficient: $\binom{n}{r} = \frac{n!}{r!(n-r)!}$</p>	First of all, start with knowing the definitions and formulae
Easy Questions	1. Using Binomial Theorem, find the first four terms of $(1+3x)^4$.	Easy Questions usually deal with applying formulae in a very straightforward
Standard Questions	<p>1. Using Binomial Theorem, find the first three terms of $\left(1-\frac{x}{5}\right)^7$.</p> <p>i) Hence, obtain the coefficient of x^2 in the expansion of $(3x+2)\left(1-\frac{x}{5}\right)^7$.</p> <p>ii) Hence, estimate the value of $2.3 \times (0.98)^7$, correct to 3 significant figures.</p> <p>2. Using Binomial Theorem, find the first three terms of $\left(5x+\frac{2}{x^2}\right)^7$.</p> <p>Hence, obtain the coefficient of x^2 in the expansion of $(4x-2)^2\left(5x+\frac{2}{x^2}\right)^7$.</p> <p>3. Find the term independent of x in $\left(x+\frac{\sqrt{3}}{x^3}\right)^7$</p> <p>4. Find the coefficient of x^{-1} in the binomial expansion of $\left(3x^2-\frac{2}{x^3}\right)^7$</p> <p>5. Given that the coefficient of the third term in the expansion of $(2x-3)^n$ is -253440, find the value of n where n is a positive integer.</p> <p>6. In the expansion of $(3+2x)^n$, the coefficient of x^2 and x^3 are in the ratio of 9:1. Find the value of n.</p>	Standard Questions are questions often found in our textbook exercises or assessment books. Usually, the values of the variables are changed but the question types will not divert too much away from these standard form.
Challenging Questions	<p>1. Given that $(1+kx)^n = 1+20x+45k^2x^2+\dots$, find the value of k and n.</p> <p>2. Obtain the first three terms in the expansion, in ascending powers of x, of $\left(4-\frac{x^2}{3}\right)^6$. Hence, find the coefficient of x^3 in the expansion of $\left(1+\frac{2x}{\sqrt{3}}\right)^6\left(1-\frac{2x}{\sqrt{3}}\right)^6$.</p>	Challenging questions are hardly predictable. They are either more complicated in form or require knowledge from other chapters. To answer these questions, students have to be generally strong in their foundation in math and have a thorough understanding of the chapter.