

SUVA SANGAM COLLEGE
YEAR 13
MATHEMATICS
WORKSHEET 11

Strand	Algebra
Sub-Strand	Binomial Theorem
Content Learning Outcome	Study Binomial Theorem and apply in binomial expansion

Questions

	<p>CONCEPT IN BRIEF: To find the nth term in a binomial expansion: Steps</p> <ul style="list-style-type: none"> - List x, y, n and r. - Determine r <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $r = nth \text{ term} - 1$ </div> <p>Example 3rd term $r = 3 - 1 = 2$ 5th term = $5 - 1 = 4$</p> <ul style="list-style-type: none"> - Substitute x, y, n and r in the general formula. - Simplify
1.	Find the 8 th term in the expansion of $(x^3 - \frac{1}{x^2})^{10}$
	<p>CONCEPT IN BRIEF: State steps to expand $(x + y)^n$ using the general formula of the Binomial Theorem.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> $(x + y)^n$ \swarrow 1st Term </div> <div style="margin: 0 20px;"> <math>\xrightarrow{\text{2nd term}}</math> </div> <div style="text-align: center;"> general formula \Downarrow </div> </div> <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> $T_n = \binom{n}{r} (x)^{n-r} (y)^r$ </div> <p>Note: If the question says find the first 4 terms in the expansion of $(x - 2y)^{30}$ $x = x \quad y = 2y \quad n = 30 \quad r = 0, 1, 2, 3$</p>
2.	Write the first 3 terms in the expansion of $(1 + 2x)^{14}$.
	<p>CONCEPT IN BRIEF: State steps to expand $(x + y)^n$ using the general formula of the Binomial Theorem.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> $(x + y)^n$ \swarrow 1st Term </div> <div style="margin: 0 20px;"> <math>\xrightarrow{\text{2nd term}}</math> </div> <div style="text-align: center;"> general formula \Downarrow </div> </div> <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> $T_n = \binom{n}{r} (x)^{n-r} (y)^r$ </div>
3.	Use the binomial theorem to expand and simplify $(x + 2)^4$