

Advanced Higher Maths

Binomial Theorem

2001

Expand $\left(x^2 - \frac{2}{x}\right)^4$, $x \neq 0$ and simplify as far as possible.

(5 marks)

2004

Obtain the binomial expansion of $(a^2 - 3)^4$.

(3 marks)

2007

Express the binomial expansion of $\left(x - \frac{2}{x}\right)^4$ in the form $ax^4 + bx^2 + c + \frac{d}{x^2} + \frac{e}{x^4}$ for integers a, b, c, d and e .

(4 marks)

2008

Write down and simplify the general term in the expansion of $\left(x^2 + \frac{1}{x}\right)^{10}$.

Hence or otherwise, obtain the term in x^{14} .

(3, 2 marks)

2009

(a) Write down the binomial expansion of $(1+x)^5$.

(b) Hence show that 0.9^5 is 0.59049 .

(1, 2 marks)

2010

Show that

$$\binom{n+1}{3} - \binom{n}{3} = \binom{n}{2}$$

where the integer n is greater than or equal to 3.

(4 marks)

2011

Use the binomial theorem to expand $\left(\frac{1}{2}x - 3\right)^4$ and simplify your answer.

(3 marks)

2012

Write down and simplify the general term in the expansion of $\left(2x - \frac{1}{x^2}\right)^9$.

Hence, or otherwise, obtain the term independent of x .

(3, 2 marks)

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2013

Write down the binomial expansion of $\left(3x - \frac{2}{x^2}\right)^4$ and simplify your answer.

(4 marks)

2014

Write down and simplify the general term in the expression $\left(\frac{2}{x} + \frac{1}{4x^2}\right)^{10}$.

Hence, or otherwise, obtain the term in $\frac{1}{x^{13}}$.

(5 marks)

2015

① Use the binomial theorem to expand and simplify

$$\left(\frac{x^2}{3} - \frac{2}{x}\right)^5$$

(4 marks)

② Show that $\binom{n+2}{3} - \binom{n}{3} = n^2$, for all integers, n , where $n \geq 3$.

(4 marks)