



Binomial Expansion Exam Questions (from OCR 4724)

Q1 (Jun 2015, Q4)

- (i) Find the first three terms in the binomial expansion of $(8 - 9x)^{\frac{2}{3}}$ in ascending powers of x . [4]
- (ii) State the set of values of x for which this expansion is valid. [1]

Q2, (Jun 2016, Q7)

Given that the binomial expansion of $(1 + kx)^n$ is $1 - 6x + 30x^2 + \dots$, find the values of n and k . State the set of values of x for which this expansion is valid. [6]

Q3 (Jun 2014, Q3)

- (i) Find the first three terms in the expansion of $(1 - 2x)^{-\frac{1}{2}}$ in ascending powers of x , where $|x| < \frac{1}{2}$. [3]
- (ii) Hence find the coefficient of x^2 in the expansion of $\frac{x+3}{\sqrt{1-2x}}$. [2]

Q4 (Jun 2013, Q10)

- (i) Show that $\frac{x}{(1-x)^3} \approx x + 3x^2 + 6x^3$ for small values of x . [2]
- (ii) Use this result, together with a suitable value of x , to obtain a decimal estimate of the value of $\frac{100}{729}$. [2]
- (iii) Show that $\frac{x}{(1-x)^3} = -\frac{1}{x^2} \left(1 - \frac{1}{x}\right)^{-3}$. Hence find the first three terms of the binomial expansion of $\frac{x}{(1-x)^3}$ in powers of $\frac{1}{x}$. [4]
- (iv) Comment on the suitability of substituting the same value of x as used in part (ii) in the expansion in part (iii) to estimate the value of $\frac{100}{729}$. [1]

Q5 (Jan 2013, Q2)

Find the first three terms in the expansion of $(9 - 16x)^{\frac{3}{2}}$ in ascending powers of x , and state the set of values for which this expansion is valid. [5]

Q6 (Jun 2012, Q3)

- (i) Expand $\frac{1+x^2}{\sqrt{1+4x}}$ in ascending powers of x , up to and including the term in x^3 . [6]
- (ii) State the set of values of x for which this expansion is valid. [1]

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Q7, (Jan 2012, Q4)

(i) Expand $(1 - 4x)^{\frac{1}{4}}$ in ascending powers of x , up to and including the term in x^3 . [5]

(ii) The term of lowest degree in the expansion of

$$(1 + ax)(1 + bx^2)^7 - (1 - 4x)^{\frac{1}{4}}$$

in ascending powers of x is the term in x^3 . Find the values of the constants a and b . [4]

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