

Binomial expansion

AS Pure Mathematics | Edexcel 8MA0 | 12 questions, 50 marks

A-level Maths topic practice



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Name: _____ **Date:** _____ **Score:** _____ / 50

1 Expand $(2 + x)^4$ fully, simplifying each term. (3 marks)

Answer _____

2 Find the first four terms, in ascending powers of x , of the binomial expansion of $(1 - 3x)^6$.
Give each term in its simplest form. (3 marks)

Answer _____

3 Find the coefficient of x^3 in the binomial expansion of $(3 + 2x)^7$ (2 marks)

Answer _____

4 In the binomial expansion of $(1 + kx)^9$, where k is a positive constant, the coefficient of x^2 is 252.
Find the exact value of k . (3 marks)

Answer _____

5

- a. Find the first four terms, in ascending powers of x , of the binomial expansion of $(2 - \frac{x}{4})^8$. Give each term in its simplest form.
- b. Use your expansion, with a suitable value of x , to find an estimate for 1.975^8 . Give your answer to 3 decimal places.

(6 marks)

Answer _____

6

- In the binomial expansion of $(a + 3x)^6$, where a is a non-zero constant, the coefficient of x is equal to the coefficient of x^2 . Find the value of a .

(4 marks)

Answer _____

7

- In the binomial expansion of $(1 + 2x)^n$, where n is a positive integer, the coefficient of x^2 is 180. Find the value of n .

(4 marks)

Answer _____

8

- a. Find the first four terms, in ascending powers of x , of the binomial expansion of $(2 - x)^6$
- b. Hence find the coefficient of x^3 in the expansion of $(1 + 4x)(2 - x)^6$

(5 marks)

Answer _____

9

- Find the term independent of x in the binomial expansion of $(2x - \frac{3}{x})^6$

(4 marks)

Answer _____

10

- The first three terms, in ascending powers of x , of the binomial expansion of $(1 + px)^n$ are
- $$1 + 12x + 63x^2$$
- where n is a positive integer and p is a constant.
- Find the value of n and the value of p .

(5 marks)

Answer _____

11

Priya invests £5000 in an account that pays $r\%$ interest per year, compounded annually.

After 10 years the account holds $£5000(1 + 0.01r)^{10}$

- Use the first three terms of the binomial expansion of $(1 + y)^{10}$, in ascending powers of y , to estimate the amount in the account after 10 years when $r = 2$
- Explain why your answer to part (a) is less than the true amount.
- Find the percentage error in your estimate. Give your answer to 2 significant figures.

(5 marks)

Answer _____

12

- Find the first three terms, in ascending powers of x , of the binomial expansion of $(2 + kx)^5$, where k is a non-zero constant. Give each term in terms of k .
- Given that the coefficient of x^2 in the expansion of $(3 - x)(2 + kx)^5$ is 160, find the possible values of k .

(6 marks)

Answer _____

End of questions | Total 50 marks