

A-Level Mathematics: AS: Binomial Expansion

Priority Learning

Worksheet

Name: _____ Date: _____

Question:	1	2	3	4	5	6
Marks:	3	4	9	6	6	8
Score:						
Question:	7	8	9	10	11	Total
Marks:	5	6	6	5	6	64
Score:						

Aims of this worksheet:

- To be able to expand binomial expressions using Pascal's triangle,
- To be able to understand and use factorial notation,
- To be able to find specific coefficients in a binomial expansion,
- To make approximations using binomial expansion.

1. Using Pascal's triangle, find the full expansions for $(8 + x)^4$ (3 marks)

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2. Find the binomial expansion for $(2x - y)^3$ (4 marks)

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3. (a) Expand the binomial $(3 + y)^4$. (3 marks)

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(b) Using part (a), expand $(3 + x - x^2)^4$ in ascending powers of x

(6 marks)

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4. Fully expand $(1+x)^3(3-4x)^3$

(6 marks)

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5. (a) Find the first 3 terms, in ascending powers of x , of the binomial expansion of $(2 + ax)^7$, giving each term in its simplest form. (4 marks)

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- (b) Given that the coefficient for x^2 is 6048, find the values for a . (2 marks)

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6. (a) Expand the binomial $(4 + z)^3$. (3 marks)

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(b) Using part (a), expand $(4 + 2x + x^2)^3$ in ascending powers of x

(5 marks)

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7. (a) Find the first 4 terms, in ascending powers of x , of $(1 + 3x)^5$. (3 marks)

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- (b) Using a suitable substitution find an approximation for 1.3^5 . (2 marks)

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8. (a) Find the first 4 terms of the expansion of $(1 + \frac{x}{5})^{10}$ in ascending powers of x , giving each term in its simplest form. (4 marks)

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- (b) Use your expansion to estimate the value of $(0.9)^{10}$. (2 marks)

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9. (a) Find the first 4 terms of the expansion of $(7 + \frac{x}{8})^8$ in ascending powers of x , giving each term in its simplest form. (4 marks)

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- (b) Use your expansion to estimate the value of $(7.0625)^8$, giving your answer in standard form to 5 decimal places. (2 marks)

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10. (a) Find the first 4 terms of the expansion of $(1 + 2x)^{12}$ in ascending powers of x , giving each term in its simplest form. (3 marks)

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- (b) Use your expansion to estimate the value of $(1.05)^{12}$, giving your answer to 3 decimal places. (2 marks)

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11. (a) Find the first 4 terms of the expansion of $(1 - 4x)^8$ in ascending powers of x , giving each term in its simplest form. (4 marks)

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- (b) Use your expansion to estimate the value of $(0.936)^8$, giving your answer to 5 decimal places. (2 marks)

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