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## Binomial Expansion - Past Edexcel Exam Questions

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1. (Question 2 - C2 May 2018)

(a) Find the first 4 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(2 + kx)^7$$

where  $k$  is a non-zero constant. Give each term in its simplest form. [4]

Given that the coefficient of  $x^3$  in this expansion is 1890,

(b) find the value of  $k$ . [3]

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2. (Question 1 - C2 May 2017)

Find the first 4 terms, in ascending powers of  $x$ , of the binomial expansion of

$$\left(3 - \frac{1}{3}x\right)^5$$

giving each term in its simplest form. [4]

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3. (Question 5 - C2 May 2016)

(a) Find the first 3 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(2 - 9x)^4$$

giving each term in its simplest form. [4]

$$f(x) = (1 + kx)(2 - 9x)^4, \quad \text{where } k \text{ is a constant}$$

The expansion, in ascending powers of  $x$ , of  $f(x)$  up to and including the term in  $x^2$  is

$$A - 232x + Bx^2$$

where  $A$  and  $B$  are constants.

- (b) Write down the value of  $A$ . [1]  
 (c) Find the value of  $k$ . [2]  
 (d) Hence find the value of  $B$ . [2]

4. **(Question 1 - C2 May 2015)**

Find the first 3 terms, in ascending powers of  $x$ , of the binomial expansion of

$$\left(2 - \frac{x}{4}\right)^{10}$$

giving each term in its simplest form. [4]

5. **(Question 3 - C2 May 2014)**

(a) Find the first 3 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(2 - 3x)^6$$

giving each term in its simplest form. [4]

(b) Hence, or otherwise, find the first 3 terms, in ascending powers of  $x$ , of the expansion of

$$\left(1 + \frac{x}{2}\right)(2 - 3x)^6$$

[3]

6. **(Question 2 - C2 May 2013)**

(a) Use the binomial theorem to find all the terms of the expansion of

$$(2 + 3x)^4$$

Give each term in its simplest form. [4]

(b) Write down the expansion of

$$(2 - 3x)^4$$

in ascending powers of  $x$ , giving each term in its simplest form. [1]

7. (Question 1 - C2 Jan 2013)

Find the first 3 terms, in ascending powers of  $x$ , in the binomial expansion of

$$(2 - 5x)^6$$

Give each term in its simplest form. [4]

8. (Question 1 - C2 May 2012)

Find the first 3 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(2 - 3x)^5$$

giving each term in its simplest form. [4]

9. (Question 3 - C2 Jan 2012)

(a) Find the first 4 terms of the binomial expansion, in ascending powers of  $x$ , of

$$\left(1 + \frac{x}{4}\right)^8$$

giving each term in its simplest form. [4]

(b) Use your expansion to estimate the value of  $(1.025)^8$ , giving your answer to 4 decimal places. [3]

10. (Question 2 - C2 May 2011)

(a) Find the first 3 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(3 + bx)^5$$

where  $b$  is a non-zero constant. Give each term in its simplest form. [4]

Given that, in this expansion, the coefficient of  $x^2$  is twice the coefficient of  $x$ ,

(b) find the value of  $b$ . [2]

11. (Question 5 - C2 Jan 2011)

Given that  $\binom{40}{4} = \frac{40!}{4!b!}$ ,

(a) write down the value of  $b$ . [1]

In the binomial expansion of  $(1 + x)^{40}$ , the coefficients of  $x^4$  and  $x^5$  are  $p$  and  $q$  respectively.

(b) Find the value of  $\frac{q}{p}$ . [3]

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12. (Question 4 - C2 June 2010)

(a) Find the first 4 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(1 + ax)^7$$

where  $a$  is a constant. Give each term in its simplest form. [4]

Given that the coefficient of  $x^2$  in this expansion is 525,

(b) find the possible values of  $a$ . [2]

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13. (Question 1 - C2 Jan 2010)

Find the first 3 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(3 - x)^6$$

and simplify each term. [4]

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## Solutions

1. (a)  $128 + 448kx + 672k^2x^2 + 560k^3x^3$   
 (b)  $k = 1.5$
2.  $243 - 135x + 30x^2 - \frac{10}{3}x^3$
3. (a)  $16 - 288kx + 1944x^2$   
 (b)  $A = 16$   
 (c)  $k = \frac{7}{2}$   
 (d)  $B = 936$
4.  $1024 - 1280x + 720x^2$
5. (a)  $64 - 576x + 2160x^2$   
 (b)  $64 - 544x + 1872x^2$
6. (a)  $16 + 96x + 216x^2 + 216x^3 + 81x^4$   
 (b)  $16 - 96x + 216x^2 - 216x^3 + 81x^4$
7.  $64 - 960x + 6000x^2$
8.  $32 - 240x + 720x^2$
9. (a)  $1 + 2x + \frac{7}{4}x^2 + \frac{7}{8}x^3$   
 (b)  $1 + 0.2 + 0.0175 + 0.000875 \approx 1.2184$
10. (a)  $243 + 405bx + 270b^2x^2$   
 (b)  $b = 3$
11. (a)  $b = 36$   
 (b)  $\frac{q}{p} = \frac{36}{5}$  when simplified.
12. (a)  $1 + 7ax + 21a^2x^2 + 35a^3x^3$   
 (b)  $a = \pm 5$
13.  $729 - 1458x + 1215x^2$