

1.5 Binomial Theorem

Question Paper

Course	DP IB Maths
Section	1. Number & Algebra
Topic	1.5 Binomial Theorem
Difficulty	Very Hard

Time allowed: 90

Score: /71

Percentage: /100

Question 1

Given that
$$(2 + nx)^2 (1 - 2x)^n = 4 - 24x + ...$$

Find the value of n.

[7 marks]

Question 2

Given that
$$(1 + nx)^2 \left(1 + \frac{2x}{3}\right)^n = 1 + 40x \dots$$

Find the value of n.

[7 marks]

Question 3a
Consider the expansion $(5 + x)^5$.
(a) Write down and simplify the expansion in descending powers of x .

(b) Hence, find the exact value of $(5.1)^5$.

[3 marks]

[3 marks]

Question 4a

Consider the expansion $(2 - x)^3$.

(a) Write down and simplify the expansion in descending powers of x.

[3 marks]

Question 4b

(b) Hence find the exact value of $(1.8)^3$.

[3 marks]

Question 5a

Given that $(1 - 2x)^2(1 + yx)^3 = 1 + zx + 32x^2 + \dots + ky^3x^5$.

(a) Determine the value of k.

[2 marks]

Question 5b

(b) Find the possible values of y and z.

[7 marks]

Question 6a

Given that
$$(1 - 2ax)^3(1 + 3x)^3 = 1 + bx - 27x^2 + \dots + ka^3x^6$$
.

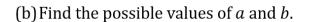
(a) Determine the value of k.

[2 marks]



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Question 6b



[7 marks]

Question 7

In the expansion of $2x^2(3 + kx)^7$, the coefficient of the term in x^5 is 210.

Find the value of k.

[6 marks]

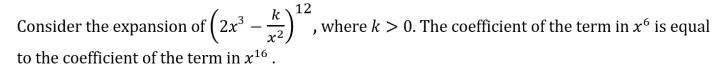
Question 8

Consider the expansion of $\left(\frac{x^3}{a} + 3x^5\right)^9$, a > 0. The coefficient of the x^{39} term is five times the coefficient of the x^{31} term.

Find *a*, giving your answer to 3 significant figures.

[7 marks]

Question 9



Find k.

[6 marks]

Question 10

The coefficient of the x^5 term in the expansion of $(1 + 2x)^4 (1 - px)^3$ is -120.

Find the value of p.

[8 marks]



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