1.6 Binomial Theorem

Question Paper

Course	DP IB Maths
Section	1. Number & Algebra
Topic	1.6 Binomial Theorem
Difficulty	Medium

Time allowed: 70

Score: /55

Percentage: /100

Question 1

Find the coefficient of the term in x^3 in the expansion of $(2 - x)^8$.

[3 marks]

Question 2

Find the first three terms, in ascending powers of x, in the expansion of $(3 + x)^4$.

[3 marks]

Question 3

In the expansion of $(a - x)^4$, the coefficient of the x^2 term is 96.
Given that $a > 0$, find the value of a.

[4 marks]

Question 4

Find the first three terms in the expansion of $(9 - 2x)^5$.

[3 marks]

Question 5

In the expansion of $(a - 2x)^5$, the coefficient of the x^2 term is equal to the coefficient of the x^3 term. Find the value of a.

[4 marks]

Question 6

In the expansion of $(3 + px)^6$, the coefficient of the x^4 is four times the coefficient of the x^2 term. Find the possible values of p.

[3 marks]

Question 7a

Consider the expansion of $(4ax - 3)^5$.

(a) Write down the number of terms in this expansion.

[1 mark]

Question 7b

(b) The coefficient of the term in x^4 is -61440.
Find the value of a where a is a positive constant.

[4 marks]

Question 8a

Consider the expansion of $(x^3 + \frac{4}{x})^4$.

(a) Write the first three terms in descending powers of x.

[3 marks]

Question 8b

(b) Find the value of the constant term.

[3 marks]

Question 9

The coefficient of x^7 in the expansion of $x^3(ax + 3)^5$ is 1215.
Find the possible values of a.

[4 marks]

Question 10a

Consider the binomial expansion of $\frac{1}{1+x}$.

(a) Write down the first four terms.

[2 marks]

Question 10b

(b) Find the values of x such that the complete expansion converges.

[2 marks]

Question 10c

(c) Use the terms found in part (a) to estimate $\frac{1}{1.1}$.

[2 marks]

Question 11a

Consider the binomial expansion of $\sqrt[3]{4(2+x)}$.

(a) Write down the first three terms.

[4 marks]

Question 11b

(b) State the interval of convergence for the complete expansion.

[2 marks]

Question 11c

(c) Use the terms found in part (a) to estimate $\sqrt[3]{12}$. Give your answer as a fraction.

[2 marks]

Question 12a

Consider the binomial expansion of $\frac{1}{\sqrt{4+x}}$.

(a) Write down the first four terms.

[4 marks]

Question 12b

(b) State the interval of convergence for the complete expansion.

[2 marks]