

Algebra Binomial P1 non calc

59 min
68 marks

1. (a) Expand $(2 + x)^4$ and simplify your result. (3)

(b) Hence, find the term in x^2 in $(2 + x)^4 \left(1 + \frac{1}{x^2}\right)$.

(3)
(Total 6 marks)

2. The fifth term in the expansion of the binomial $(a + b)^n$ is given by $\binom{10}{4} p^6 (2q)^4$.

(a) Write down the value of n . (1)

(b) Write down a and b , in terms of p and/or q . (2)

(c) Write down an expression for the sixth term in the expansion. (3)
(Total 6 marks)

3. Given that $(3 + \sqrt{7})^3 = p + q\sqrt{7}$ where p and q are integers, find

(a) p ;

(b) q .

Working:

Answers:

(a)

(b)

(Total 6 marks)

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

Working:

Answer:

.....

(Total 6 marks)

5. Find the term containing x^{10} in the expansion of $(5 + 2x^2)^7$.

Working:

Answer:

.....

(Total 6 marks)

6. Complete the following expansion.

$$(2 + ax)^4 = 16 + 32ax + \dots$$

Working:

Answer:

.....

(Total 6 marks)

7. Consider the expansion of $\left(3x^2 - \frac{1}{x}\right)^9$.

- (a) How many terms are there in this expansion?
- (b) Find the constant term in this expansion.

Working:

Answers:

(a)

.....

...

(b)

.....

...

(Total 6 marks)

8. Find the coefficient of x^3 in the expansion of $(2 - x)^5$.

Working:

Answer:

.....

(Total 6 marks)

9. Use the binomial theorem to complete this expansion.

$$(3x + 2y)^4 = 81x^4 + 216x^3y + \dots$$

Working:

Answer:

.....

(Total 4 marks)

10. Consider the binomial expansion $(1+x)^4 = 1 + \binom{4}{1}x + \binom{4}{2}x^2 + \binom{4}{3}x^3 + x^4$.

- (a) By substituting $x = 1$ into both sides, or otherwise, evaluate $\binom{4}{1} + \binom{4}{2} + \binom{4}{3}$.

(b) Evaluate $\binom{9}{1} + \binom{9}{2} + \binom{9}{3} + \binom{9}{4} + \binom{9}{5} + \binom{9}{6} + \binom{9}{7} + \binom{9}{8}$.

Working:

Answers:

(a)

.....

...

(b)

.....

...

(Total 4 marks)

11. Find the coefficient of a^5b^7 in the expansion of $(a + b)^{12}$.

Working:

Answer:

.....

(Total 4 marks)

12. Find the coefficient of x^5 in the expansion of $(3x - 2)^8$.

Working:

Answer:

.....

(Total 4 marks)

13. Find the coefficient of a^3b^4 in the expansion of $(5a + b)^7$.

Working:

Answer:

.....

(Total 4 marks)