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

Working:

Answers:

.....

(Total 4 marks)

2. Given that

$$(1 + x)^5 (1 + ax)^6 \equiv 1 + bx + 10x^2 + \ldots\ldots\ldots\ldots + a^6 x^{11},$$

find the values of $a, b \in \mathbb{Z}^*$.

Working:

Answers:

.....

(Total 4 marks)

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

Working:

Answers:

.....

(Total 4 marks)

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

Working:

Answers:

.....

(Total 4 marks)

5. Find the coefficient of x^7 in the expansion of $(2 + 3x)^{10}$, giving your answer as a whole number.

Working:

Answers:

.....

(Total 3 marks)

6. The coefficient of x in the expansion of $\left(x + \frac{1}{ax^2}\right)^7$ is $\frac{7}{3}$. Find the possible values of a.

Working:

Answers:

.....

(Total 3 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. Find the coefficient of x^3 in the binomial expansion of $\left(1-\frac{1}{2}x\right)^8$.

Working:

Answer:

……..

(Total 6 marks)

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

Working:

Answer:

……..

(Total 6 marks)

11. Complete the following expansion.

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

Working:

Answer:

……..

(Total 6 marks)
(Total 6 marks)

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

Working:

Answer:

…….....

(Total 6 marks)

13. (a) Find the expansion of $(2 + x)^5$, giving your answer in ascending powers of x.

(b) By letting $x = 0.01$ or otherwise, find the **exact** value of 2.01^5.

Working:

Answers:

(a) ……..

(b) ……..

(Total 6 marks)

14. Determine the constant term in the expansion of $\left(x - \frac{2}{x^2}\right)^9$.

Working:

Answers:

……..

(Total 4 marks)

15. Use the binomial theorem to complete this expansion.

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

Working:

Answers:

……..

(Total 4 marks)

(Total 4 marks)

16. 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)