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

(Total 5 marks)

2. One of the terms of the expansion of $(x + 2y)^{10}$ is $ax^8 y^2$. Find the value of a.

(Total 6 marks)

3. Consider the expansion of the expression $(x^3 - 3x)^6$.

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

(b) Find the term in x^{12}.

(Total 6 marks)

4. Find the term in x^4 in the expansion of $\left(3x^2-\frac{2}{x}\right)^5$.

(Total 6 marks)

5. (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)

6. (a) Expand $(x – 2)^4$ and simplify your result.

(3)

(b) Find the term in x^3 in $(3x + 4)(x – 2)^4$.

(3)
(Total 6 marks)

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

(Total 4 marks)

8. (a) Expand $\left(\mathrm{e}+\frac{1}{\mathrm{e}}\right)^4$ in terms of e.

(4)

(b) Express $\left(\mathrm{e}+\frac{1}{\mathrm{e}}\right)^4 + \left(\mathrm{e}-\frac{1}{\mathrm{e}}\right)^4$ as the sum of three terms.

(2)
(Total 6 marks)

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

(a) p;

(b) q.

(Total 6 marks)

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

(Total 6 marks)

11. 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.

(Total 6 marks)

12. When the expression $(2+ax)^{10}$ is expanded, the coefficient of the term in x^3 is 414 720. Find the value of a.

(Total 6 marks)