Algebra Binomial P2

37 min
37 marks

1. Consider the expansion of $(x + 2)^{11}$.

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

(1)

(b) Find the term containing x^2.

(4)
(Total 5 marks)

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

(Total 6 marks)

3. Let $f(x) = x^3 - 4x + 1$.

(a) Expand $(x + h)^3$.

(2)

(b) Use the formula $f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$ to show that the derivative of $f(x)$ is $3x^2 - 4$.

(4)

(c) The tangent to the curve of f at the point P(1, –2) is parallel to the tangent at a point Q. Find the coordinates of Q.

(4)

(d) The graph of f is decreasing for $p < x < q$. Find the value of p and of q.

(3)

(e) Write down the range of values for the gradient of f.

(2)
(Total 15 marks)

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

(Total 5 marks)

5. (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)