



Ross High School: Mathematics Department

Higher Mathematics: Homework 8

1. (a) (i) Show that $(x-2)$ is a factor of $f(x) = 2x^3 - 3x^2 - 3x + 2$. (3)
- (ii) Hence factorise $f(x)$ fully. (2)
- (b) Solve $2(x^3 + 1) = 3x(x + 1)$. (3)
2. (a) Given that $(x + 2)$ is a factor of $2x^3 + x^2 + kx + 2$, find the value of k . (4)
- (b) Hence solve the equation $2x^3 + x^2 + kx + 2 = 0$ when k takes this value. (3)
3. $f(x) = 2x^3 + px^2 + qx + 4$.
- Given that $(x - 2)$ is a factor of $f(x)$, and the remainder when $f(x)$ is divided by $(x + 1)$ is 9, find the values of p and q . (7)
4. Show that the line with equation $4x - y - 1 = 0$ is a tangent to the parabola with equation $y = 2x^2 + 12x + 7$ and find the point of contact. (5)