

Polynomials

- 1) (a) Given that $x + 2$ is a factor of $2x^3 + x^2 + kx + 2$, find the value of k . 3
(b) Hence solve the equation $2x^3 + x^2 + kx + 2 = 0$ when k takes this value. 2

2) Factorise $2x^3 - 7x^2 + 4x + 4$. 3

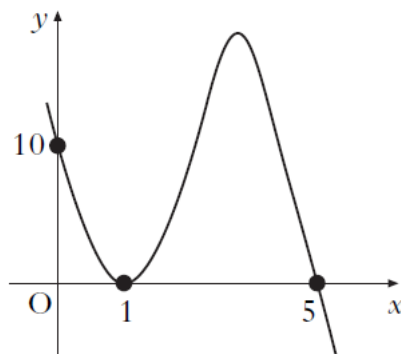
3) Given that $(x - 2)$ and $(x + 3)$ are factors of $f(x)$ where $f(x) = 3x^3 + 2x^2 + cx + d$, find the values of c and d . 5

4) $f(x) = x^3 - x^2 - 5x - 3$.
(a) (i) Show that $(x + 1)$ is a factor of $f(x)$.
(ii) Hence or otherwise factorise $f(x)$ fully. 5
(b) One of the turning points of the graph of $y = f(x)$ lies on the x -axis. Write down the coordinates of this turning point. 1

5) A function f is defined on the set of real numbers by $f(x) = x^3 - 3x + 2$.

- (i) Show that $(x - 1)$ is a factor of $x^3 - 3x + 2$.
(ii) Hence or otherwise factorise $x^3 - 3x + 2$ fully. 5

6) The diagram shows the graph with equation $y = k(x - 1)^2(x + t)$.



What are the values of k and t ? 2

7) A function f is defined on the set of real numbers by $f(x) = x^3 - x^2 + x + 3$.
What is the remainder when $f(x)$ is divided by $(x - 1)$? 2

8) On dividing $f(x)$ by $(x - 1)$, the remainder is zero and the quotient is $x^2 - 4x - 5$.
Find $f(x)$ in its fully factorised form. 2