



Maths-it Podcast AS-04

AS Core Revision

Polynomials

Topics

Factorising cubics – The factor theorem – The remainder theorem
Solving cubic equations by factorising – Sketching cubic graphs

Questions

1. The polynomial $p(x)$ is given by,

$$p(x) = x^3 - 37x - 84$$

- (a) Use the factor theorem to show that $(x+3)$ is a factor of $p(x)$. (2)
- (b) Hence express $p(x)$ as a product of three linear factors. (3)
- (c) Sketch the graph of $y = x^3 - 37x - 84$, labelling the coordinates of the points where the curve cuts the axes. (You need not label the stationary points). (4)

(Total 9 marks)

2. The polynomial $p(x)$ is given by,

$$p(x) = x^5 + 3x^4 - 7x^3 - 15x^2 + 18x$$

- (a) Use the factor theorem to show that $(x-1)$ is a factor of $p(x)$. (2)
- (b) $(x+3)^2$ is also a factor of $p(x)$. Find the remaining two factors. (4)
- (c) Use the remainder theorem to find the remainder when $p(x)$ is divided by $(x+1)$ (2)

(Total 8 marks)

3. (a) Show that $x - 4$ is a factor of $2x^3 - 7x^2 - 5x + 4$. (2)
- (b) Hence or otherwise solve $2x^3 - 7x^2 - 5x + 4 = 0$. (4)
- (c) Sketch the graph of $y = 2x^3 - 7x^2 - 5x + 4$, labelling the coordinates of the points where the curve cuts the axes. (You need not label the stationary points). (4)

(Total 10 marks)