

5.

$$f(x) = x^3 + 3x^2 - 4x - 12.$$

(a) Using the factor theorem, explain why $f(x)$ is divisible by $(x + 3)$. (2)

(b) Hence fully factorise $f(x)$. (3)

(c) Show that $\frac{x^3 + 3x^2 - 4x - 12}{x^3 + 5x^2 + 6x}$ can be written in the form $A + \frac{B}{x}$, where A and B are integers to be found. (3)

(Total for Question 5 is 8 marks)