8 $f(x) = ax^3 + bx^2 + cx + d$, where a, b, c and d are integers.

Given that $f(0) = 6$

(a) show that $d = 6$

(1)

When $f(x)$ is divided by $(x - 1)$ the remainder is -6
When $f(x)$ is divided by $(x + 1)$ the remainder is 12

(b) Find the value of b.

(4)

Given also that $(x - 3)$ is a factor of $f(x)$,

(c) find the value of a and the value of c,

(6)

(d) express $f(x)$ as a product of linear factors.

(3)

Question 8 continued

Question 8 continued

Question 8 continued

(Total for Question 8 is 14 marks)