6 $f(x) = x^3 + (p + 1)x^2 - 10x + q$

where p and q are integers.

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

(a) show that $9p + q + 6 = 0$

(3)

Given that $(x + p)$, where $p > 0$, is also a factor of $f(x)$

(b) show that $p^2 + 10p + q = 0$

(3)

(c) Hence find the value of p and the value of q.

(5)

(d) Using your values of p and q, factorise $f(x)$ completely.

(2)

Question 6 continued

Question 6 continued

Question 6 continued

(Total for Question 6 is 13 marks)