2 $f(x) = x^3 + px + q$ where p and q are constants.

The remainder when $f(x)$ is divided by $(x - 1)$ is -12

The remainder when $f(x)$ is divided by $(x - 4)$ is 30

(a) Find the value of p and the value of q.

(6)

Using your values of p and q

(b) show that $f(3) = 0$

(1)

(c) Express $f(x)$ as a product of linear factors.

(3)

(d) Hence solve the equation $f(x) = 0$

(1)

Question 2 continued

(Total for Question 2 is 11 marks)