6 $f(x) = 4x^2 - 3x - 5$

The equation $f(x) = 0$ has roots α and β

Without solving the equation $f(x) = 0$

(a) form an equation, with integer coefficients, that has roots $\frac{2\alpha}{\beta}$ and $\frac{2\beta}{\alpha}$

(6)

$g(x) = 4x^2 + px + q$ where p and q are constants

Given that the equation $g(x) = 0$ has roots $3\alpha + \beta$ and $\alpha + 3\beta$

(b) find the value of p and the value of q

(5)

Question 6 continued

Question 6 continued

Question 6 continued

(Total for Question 6 is 11 marks)