

6 The equation  $2x^2 + px - 3 = 0$ , where  $p$  is a constant, has roots  $\alpha$  and  $\beta$ .

(a) Find the value of

(i)  $\alpha\beta$

(ii)  $\left(\alpha + \frac{1}{\beta}\right)\left(\beta + \frac{1}{\alpha}\right)$

(4)

(b) Find, in terms of  $p$ ,

(i)  $\alpha + \beta$

(ii)  $\left(\alpha + \frac{1}{\beta}\right) + \left(\beta + \frac{1}{\alpha}\right)$

(4)

Given that  $\left(\alpha + \frac{1}{\beta}\right) + \left(\beta + \frac{1}{\alpha}\right) = 2\left(\alpha + \frac{1}{\beta}\right)\left(\beta + \frac{1}{\alpha}\right)$

(c) find the value of  $p$ .

(1)

(d) Using the value of  $p$  found in part (c), find a quadratic equation, with integer

coefficients, which has roots  $\left(\alpha + \frac{1}{\beta}\right)$  and  $\left(\beta + \frac{1}{\alpha}\right)$ .

(2)



## Question 6 continued

Example



P 4 4 0 3 0 A 0 1 3 3 2

Question 6 continued

PreAptar



Question 6 continued

Example

(Total for Question 6 is 11 marks)

