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

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

Without solving the equation,

(a) determine the value of

$$(\alpha^2 + 1)(\beta^2 + 1)$$

(4)

(b) find a quadratic equation which has roots

$$\frac{\alpha}{(\alpha^2 + 1)} \text{ and } \frac{\beta}{(\beta^2 + 1)}$$

giving your answer in the form $px^2 + qx + r = 0$ where p, q and r are integers to be determined.

(6)

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Question 5 continued

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Question 5 continued

(Total for Question 5 is 10 marks)