

9 It is given that  $\alpha$  and  $\beta$  are such that  $\alpha + \beta = -\frac{5}{2}$  and  $\alpha\beta = -5$

(a) Form a quadratic equation with integer coefficients that has roots  $\alpha$  and  $\beta$  (2)

Without solving the equation found in part (a)

(b) find the value of

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

(ii)  $\alpha^3 + \beta^3$  (5)

(c) Hence form a quadratic equation with integer coefficients that has roots

$\left(\alpha - \frac{1}{\alpha^2}\right)$  and  $\left(\beta - \frac{1}{\beta^2}\right)$  (6)

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**Question 9 continued**

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**(Total for Question 9 is 13 marks)**



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