

6 (a) Show that  $(\alpha - \beta)^2 = (\alpha + \beta)^2 - 4\alpha\beta$  (3)

The quadratic equation  $x^2 - 7kx + k^2 = 0$ , where  $k$  is a positive constant, has roots  $\alpha$  and  $\beta$  where  $\alpha > \beta$

(b) Show that  $\alpha - \beta = 3k\sqrt{5}$  (3)

(c) Hence form a quadratic equation with roots  $\alpha + 1$  and  $\beta - 1$

Give your equation in the form  $x^2 + px + q = 0$  where  $p$  and  $q$  should be given in terms of  $k$ .

(4)

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**(Total for Question 6 is 10 marks)**

