

Suppose that the equation

$$x^4 + Ax^2 + B = (x^2 + ax + b)(x^2 - ax + b)$$

holds for all values of  $x$ .

(i) Find  $A$  and  $B$  in terms of  $a$  and  $b$ .

(ii) Use this information to find a factorization of the expression

$$x^4 - 20x^2 + 16$$

as a product of two quadratics in  $x$ .

(iii) Show that the four solutions of the equation

$$x^4 - 20x^2 + 16 = 0$$

can be written as  $\pm\sqrt{7} \pm \sqrt{3}$ .