

STEP III, 2002 Q5

- 5 Give a condition that must be satisfied by p , q and r for it to be possible to write the quadratic polynomial $px^2 + qx + r$ in the form $p(x + h)^2$, for some h .

Obtain an equation, which you need not simplify, that must be satisfied by t if it is possible to write

$$\left(x^2 + \frac{1}{2}bx + t\right)^2 - (x^4 + bx^3 + cx^2 + dx + e)$$

in the form $k(x + h)^2$, for some k and h .

Hence, or otherwise, write $x^4 + 6x^3 + 9x^2 - 2x - 7$ as a product of two quadratic factors.



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