

STEP II, 2004, Q1 MS

Q1(i) Put the terms with radicals on one side and the terms without on the other and square. Repeat this strategy (S) and the equation $x^4 - 6x^3 + 9x^2 - 4x = 0$ (*) will be obtained. The roots of (*) are $x = 0, 1, 4$.

Squaring may introduce spurious roots, so these numbers must be checked to see that they are roots of the original equation. In fact, they are.

(ii) Application of S again leads to (*). Checking shows that $x = 0, x = 1$ are roots of the second equation but that $x = 4$ is not.

(iii) Again application of S leads to (*). Checking shows that $x = 1, x = 4$ are roots of the third equation but that $x = 0$ is not.



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