A Book of Abstract Algebra | (2nd Edition)

Chapter 32, Problem 3EF

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Problem

Let $a(x) = x^5 - 4x^4 + 2x + 2 \in \mathbb{Q}[x]$, and let $r_1, \ldots, r_5$ be the roots of $a(x)$ in $\mathbb{C}$. Let $K\ \mathbb{Q}(r_1, \ldots, r_5)$ be the root field of $a(x)$ over $\mathbb{Q}$.

Prove: part:

If r_1 denotes a real root of $a(x)$, $[\mathbb{Q}(r_1) : \mathbb{Q}] = 5$. Use this to prove that $[K : \mathbb{Q}]$ is a multiple of 5.

Step-by-step solution

There is no solution to this problem yet.

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