

1. Consider the Galois extension $\mathbb{Q}(\sqrt{2}, \sqrt{3})/\mathbb{Q}$. What is its Galois group? What subgroup of the Galois group does the field $\mathbb{Q}(\sqrt{6})$ correspond to?

2. Is $\mathbb{Q}(\sqrt{6})/\mathbb{Q}$ Galois? What are some different methods you could use to answer this question?