Math 5320, 4/9/18 Name:

Worksheet 30:

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1. Last time we considered the following question by trying to answer it directly: What is the fixed field of $G(\mathbb{Q}(\zeta_n)/\mathbb{Q})$? What is the fixed field of $G(\mathbb{Q}(\sqrt[3]{2})/\mathbb{Q})$? What is the fixed field of the subgroup $H < G(\mathbb{Q}(\sqrt{2}, \sqrt{3})/\mathbb{Q}$ consisting of the identity and the automorphism that conjugates $\sqrt{2}$?

   How does the Fixed Field theorem help us answer these questions?

2. We showed directly last time that $\mathbb{Q}(\sqrt[3]{2})/\mathbb{Q}$ is not a Galois field extension. Using that information, what other things does Theorem 16.6.4 tell us about $\mathbb{Q}(\sqrt[3]{2})/\mathbb{Q}$? Also, what other ways could we have used Theorem 16.6.4 to decide that $\mathbb{Q}(\sqrt[3]{2})/\mathbb{Q}$ is not a Galois field extension?

Check this box if you would like feedback ☐