FALL 2019: MATH 558 QUIZ 9

Each question is worth 5 points.

1. Based upon the examples from class, describe the smallest subfield of $\mathbb{R}$ containing $\mathbb{Q}$ and a root of $x^2 - 6$. You do **not** have to prove that your answer is correct.

Solution. $\mathbb{Q}(\sqrt{6}) := \{a + b\sqrt{6} \mid a, b \in \mathbb{Q}\}$.

2. True or False: The smallest subfield of $\mathbb{R}$ containing a root of $x^3 - 2$ and $\mathbb{Q}$ is of the form $\{a + b\sqrt[3]{2} \mid a, b \in \mathbb{Q}\}$. Briefly (in one sentence) justify your answer. Again no proof is not required.

Solution. False. The product $\sqrt[3]{3} \cdot \sqrt[3]{2}$ is not of the form $a + b\sqrt[3]{2}$.