Group Random Quiz 20B

1. List two possible splitting fields for $f(x) = x^2 + 1$ over $\mathbb{Q}$.

2. Let $a \in E - F$ be a zero of a polynomial $p(x)$ that is irreducible over F, where E is an extension field of F.
   Similarly, let $b \in E' - F$ be a zero of $p(x)$, where E' is an extension field of F.
   Define an isomorphism $\varphi : F(a) \to F(b)$.

3. (True/False) If E, E' are each splitting fields of $f(x)$ over F, then E, E' are isomorphic fields.