Chapter 21 Random Quiz

(Let $a \in E$, where E is an extension field of F.)

1. a is algebraic over F provided ... (fill in definition)

2. Suppose a is transcendental over F. What field is $F(a)$ isomorphic to? (express without 'a').

3. Given that $\mathbb{Q}(\sqrt[3]{2})$ has dimension 3 over $\mathbb{Q}$, and $\mathbb{Q}(\sqrt[3]{2}, \sqrt[3]{-1})$ has dimension 2 over $\mathbb{Q}(\sqrt[3]{2})$, what is the dimension of $\mathbb{Q}(\sqrt[3]{2}, \sqrt[3]{-1})$ over $\mathbb{Q}$? (Interpret $\sqrt[3]{-1}$ as a primitive 3rd root of unity.)

4. Name a field and an element that is transcendental over that field.