Exercise 1.3.1 (3) The real number 1 is positive.

Proof We show that $1 \neq 0$ and $-1$ is not positive, which will imply 1 is positive by the Order Axiom. The field axioms state $1 \neq 0$. Now we show $-1$ is not positive by contradiction. Suppose $-1$ was positive. Then for every $a \in \mathbb{R}^+$, $(-1) \cdot a \in \mathbb{R}^+$ by the closure of $\mathbb{R}^+$ under multiplication. But $(-1) \cdot a = -a$, so $-a$ is positive. The fact $a$ and $-a$ are both positive contradicts the Order Axiom, so we conclude $-1$ is not positive. By the Order Axiom, we see that 1 is positive. QED