This miniproject asks you to investigate the concept of *dense* elements of a poset.

Definition: A poset $(R, \preceq)$ is said to be **dense** if for all $x \in R$ and $y \in R$ with $x \preceq y$, then there is an element $z \in R$ such that $x \preceq z \preceq y$.

Prove: The poset of the rational numbers with the usual $\leq$ is a dense poset.

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