The set of rational numbers, $\mathbb Q$ is defined as

$$\left\{\frac{p}{q}\mid p\in\mathbb{Z}\text{ and }q\in\mathbb{Z}\text{ and }q\neq0\right\}\quad\text{ or, equivalently, }\quad\left\{x\in\mathbb{R}\mid\exists p\in\mathbb{Z}\exists q\in\mathbb{Z}^+(p=x\cdot q)\right\}$$

Extra practice: Use the definition of set equality to prove that the definitions above give the same set.