

Extra problem: Let J be the index set defined by $J = \{x \in \mathbb{R} : 2 < x\}$.

a. Show

$$\bigcap_{x \in J} \left[-\frac{1}{x}, \frac{1}{x} \right] = \{0\}.$$

b. Show

$$\bigcup_{x \in J} \left[-\frac{1}{x}, \frac{1}{x} \right] = \left(-\frac{1}{2}, \frac{1}{2} \right).$$