Logic questions

Which of the sets S below satisfy the property that $\forall \{x,y\} \subset \mathbb{R}, (x \in S \land y > x) \rightarrow y \notin S$?

- $ightharpoonup S = \mathbb{Z}$
- $ightharpoonup S = \mathbb{R}^+$
- $ightharpoonup S = \mathbb{Z}^+$
- $S = \{-3, 4, 5\}$