Consider the set $S = \{(x, y) \in \mathbb{R}^2 : (y \leq x) \wedge (x \leq y^2)\}$

- *For each real numbers x define the set $T_x = \{y \in \mathbb{R} : (x, y) \in S\}$. For each x, give a simple description of the set T_x*

$$T_x = \begin{cases} (-\infty, -\sqrt{x}] \cup [\sqrt{x}, x] & x > 1 \\ (-\infty, -\sqrt{x}] & 0 < x \leq 1 \\ (-\infty, x] & x \leq 0 \end{cases} \tag{1}$$

- *For each real numbers y define the set $R_y = \{x \in \mathbb{R} : (x, y) \in S\}$. For each y, give a simple description of the set R_y*

$$R_y = \begin{cases} [y, y^2] & y \geq 1 \vee y \leq 0 \\ \emptyset & \text{otherwise} \end{cases} \tag{2}$$