Worksheet §1.8–2.1

1. For $m \in \mathbb{R}$, let L_m be the set $\{(x, y) \in \mathbb{R}^2 \mid y = mx\}$.

   (a) Draw and describe $\bigcap\limits_{m \in \mathbb{R}} L_m$.

   (b) Draw and describe $\bigcup\limits_{m \in \mathbb{R}} L_m$.

2. In set-builder notation, come up with an indexed collection of sets for which the following hold:

   - Every set is a subset of $\mathbb{R}^2$.

   - The intersection of the sets is $\{(0, y) : 0 \leq y\}$.

   - The union of the sets is $\{(x, y) : x^2 \leq y\}$.

3. Same question, but now the intersection is $\{(0, y) : 0 \leq y \leq 1\}$.