Exercises

14.31 [18H] Show that for a convex function $f : (a, b) \to \mathbb{R}$ there are only three possibilities:

- f is strictly increasing
- f is strictly decreasing
- There are two values $l_- \leq l_+$ such that f is strictly increasing in $[l_+, b)$, f is strictly decreasing in $(a, l_-]$, and the interval $[l_-, l_+]$ are all minimum points of f;

If also f is strictly convex then there is at most only one minimum point.