Theorem 1. Let $(x, y) \in \mathbb{R}^2$. If $x < -4$ and $y > 2$, then the distance between (x, y) and $(1, -2)$ is strictly larger than 6.

Instructions. Prove Thm. 1 algebraically ⟨using (in)equalities⟩. Do **not** use calculus. Do not argue geometrically but rather use geometric idea to form your Thinking Land.

Recall. The distance between $(x_1, y_1) \in \mathbb{R}^2$ and $(x_2, y_2) \in \mathbb{R}^2$, commonly denoted $d\left((x_1, y_1), (x_2, y_2)\right)$, is

$$d\left((x_1, y_1), (x_2, y_2)\right) = \sqrt{|x_1 - x_2|^2 + |y_1 - y_2|^2} \, .$$

Symbolically:

Thinking Land.