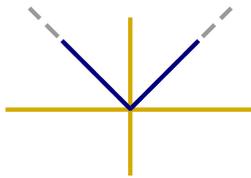**Name:**   **Present group members:**
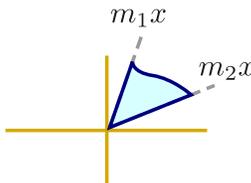

Worksheet 6-2: Q1

Indicate whether each of the given sets is a cone. If the set is a cone, indicate whether it is a convex cone or not. You must justify your answers.
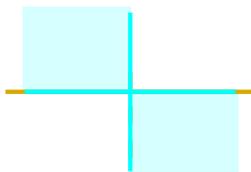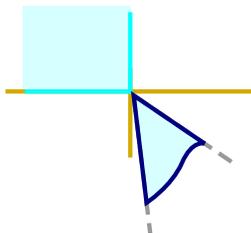
(a) $S = \{(x, |x|) \mid x \in \mathbb{R}\}$

(b) Fix $m_1, m_2 \in \mathbb{R}$ that are not equal to each other, $m_1 \neq m_2$.
$S = \{(x, y) \in \mathbb{R}^2_+ \mid y \leq m_1 x \text{ and } y \geq m_2 x\}$
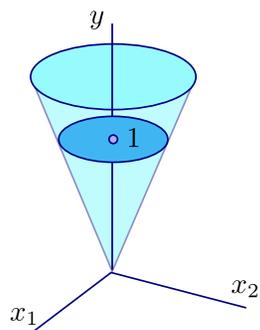
(c) $S = \{(x, y) \mid x \leq 0, y \geq 0\} \cup \{(x, y) \mid x \geq 0, y \leq 0\}$
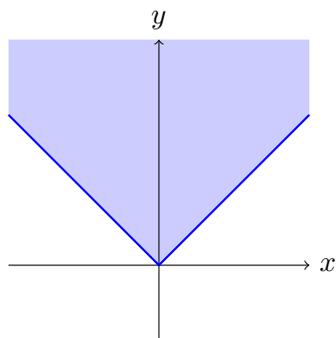
(d) The shown region (curved boundary on the bottom means it goes on forever in that direction).

(e) Lorentz cone: $\{(x_1, x_2, y) \in \mathbb{R}^3 \mid \|(x_1, x_2)\| \le y\}$

(f) $S = \{(x, y) \in \mathbb{R}^2 \mid y \ge |x|\}$.

(g) $\{\mathbf{0} \in \mathbb{R}^n\}$