MATH 340, 2024/25, Term 2, Assignment 1

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1. You should study the self-study material on the standard forms of LP, available in the Canvas/Files. Put the following linear programming problem in standard form, that is, standard inequality form. (Do not solve)

$$
\begin{aligned}
&\text{minimize} && x_1 - 3x_2 \\
&\text{subject to} && x_1 + x_2 = 2 \\
& && x_1 \geq 3 \\
& && x_2 \text{ unconstrained}
\end{aligned}
$$

2. Consider a finite set of nonzero vectors, $v_1, v_2, \ldots, v_k \in \mathbb{R}^n$, with $v_i > 0, i = 1, \ldots, k; k \geq 1$. Define

$$
C = \bigcap_{i=1}^{k} H_{v_i}
$$

where we denote

$$
H_v = \{x \in \mathbb{R}^n \mid v \cdot x \leq 1\}
$$

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   b.