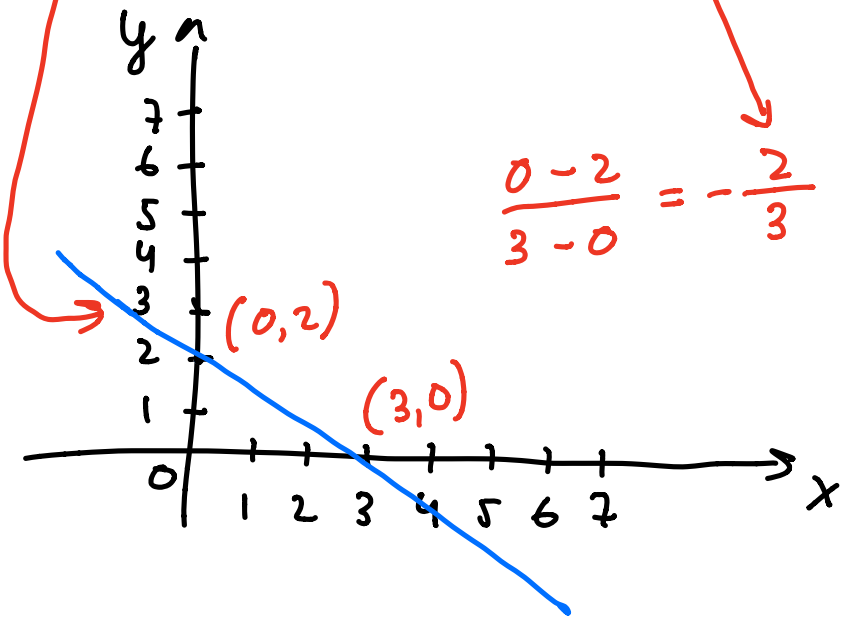
1.

$2x + 3y = 6 \Rightarrow y = -\frac{2}{3}x + 2$

m (slope), b (y-intercept)



$\frac{0-2}{3-0} = -\frac{2}{3}$

2. Yes.

3. An inequality on the form $x_1 + 2x_2 \geq 3$ can be rewritten to $-x_1 - 2x_2 \leq -3$, also, an equality $x_1 + 3x_2 = 4$ can be rewritten as $x_1 + 3x_2 \leq 4$ and $x_1 + 3x_2 \geq 4$.

4. $Ax \leq b$

$x_1 + x_2$

s.t.

$2x_1 + x_2 \leq 5$

$x_1 + 10x_2 \leq 10$

$x_1 \geq 0 \wedge x_2 \geq 0$

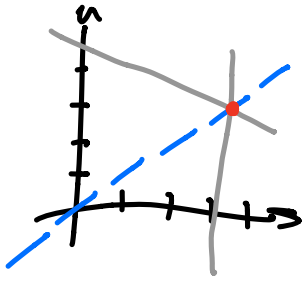
$b = \begin{pmatrix} 5 \\ 10 \end{pmatrix}$

$A = \begin{pmatrix} 2 & 1 \\ 1 & 10 \end{pmatrix}$

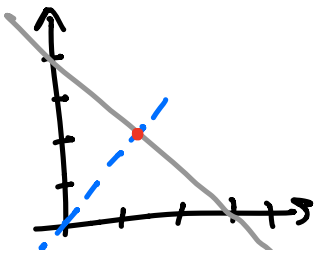
$x \in \mathbb{R}^2$

$I = \{1, 2\}$

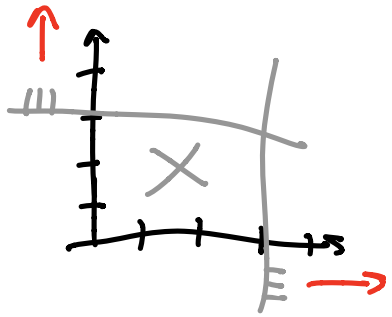
5. A unique optimal solution:



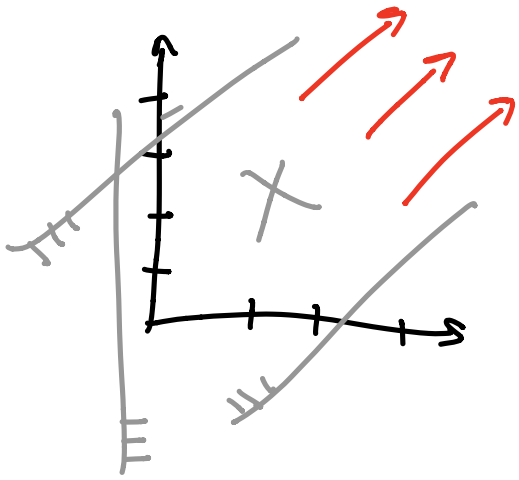
Inf. many optimal solutions:



No optimal solution due to infeasibility:



No optimal solution due to unboundedness:



6. A program is efficiently solvable if it has a space/time complexity that is bounded by a polynomial function of the input size.

7. Yes.

8. Yes.