Introduction to Linear Optimization and Extensions with MATLAB

2 Geometry of Linear Programming

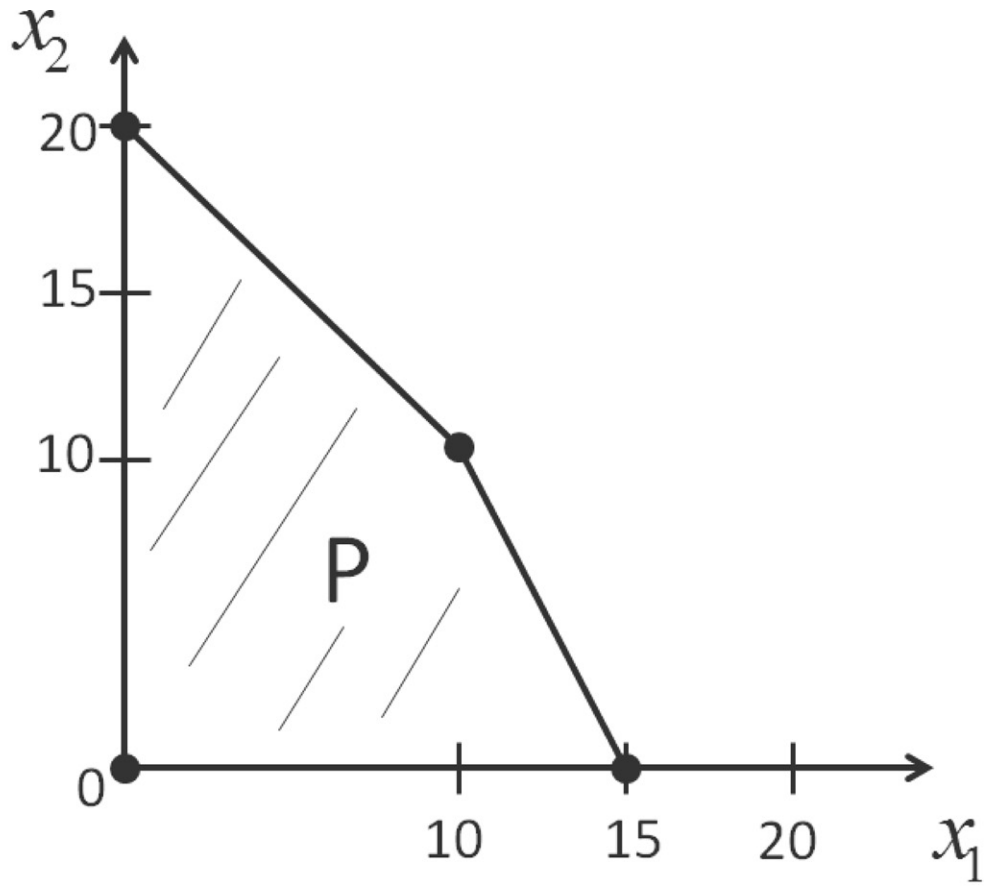

FIGURE 2.1
Graph of feasible set of LP (2.1).

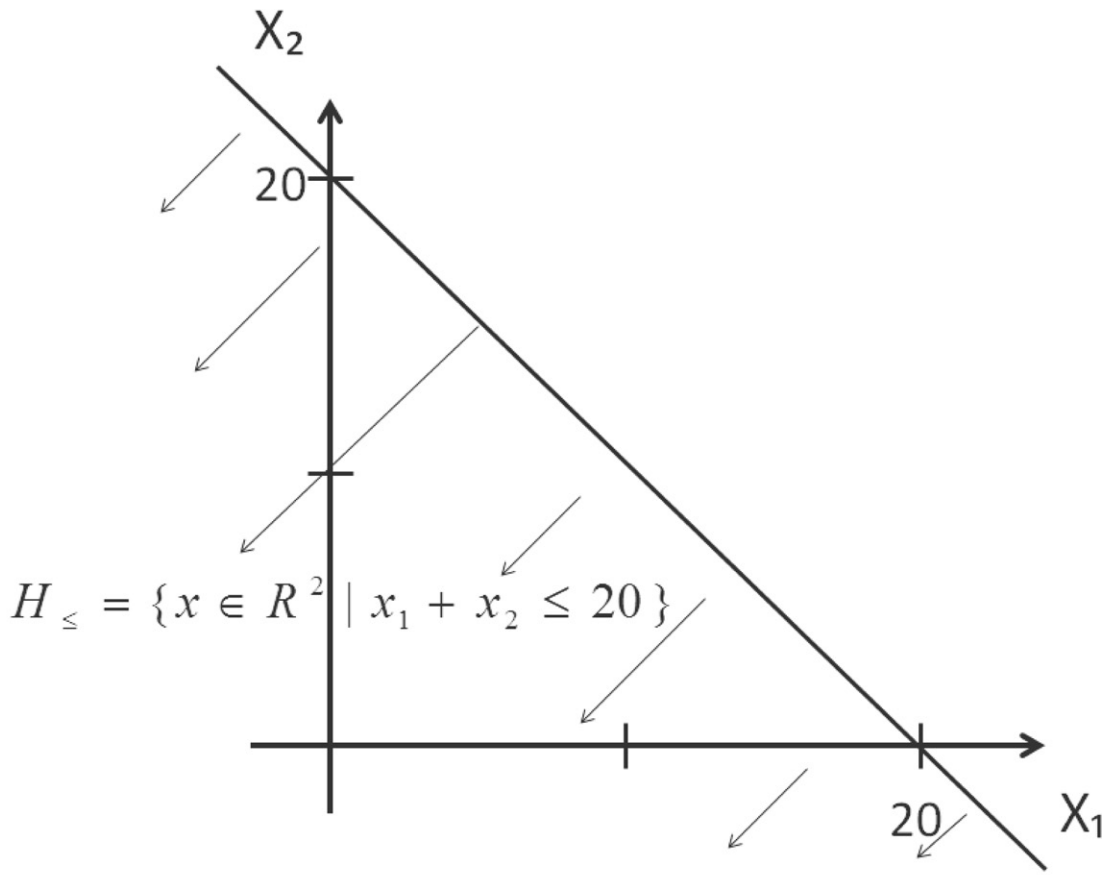

FIGURE 2.2
Closed halfspace $x_1 + x_2 \leq 20$.

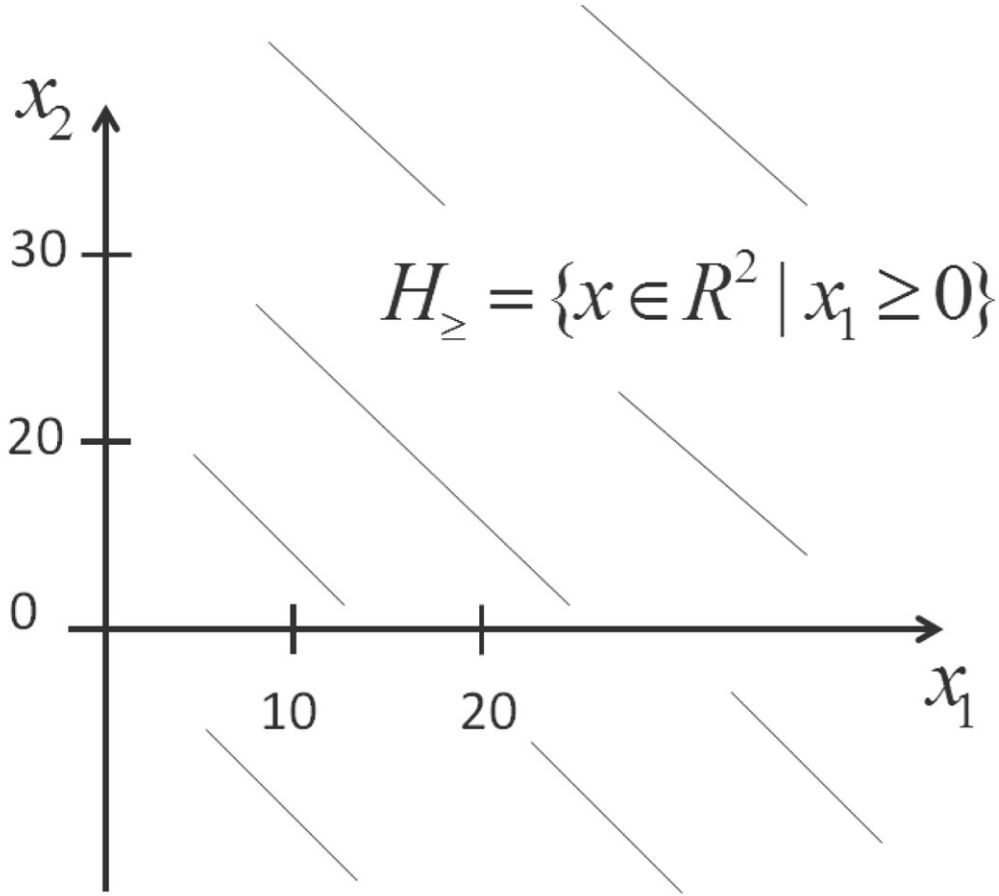

FIGURE 2.3
Closed halfspace $x_1 \geq 0$.

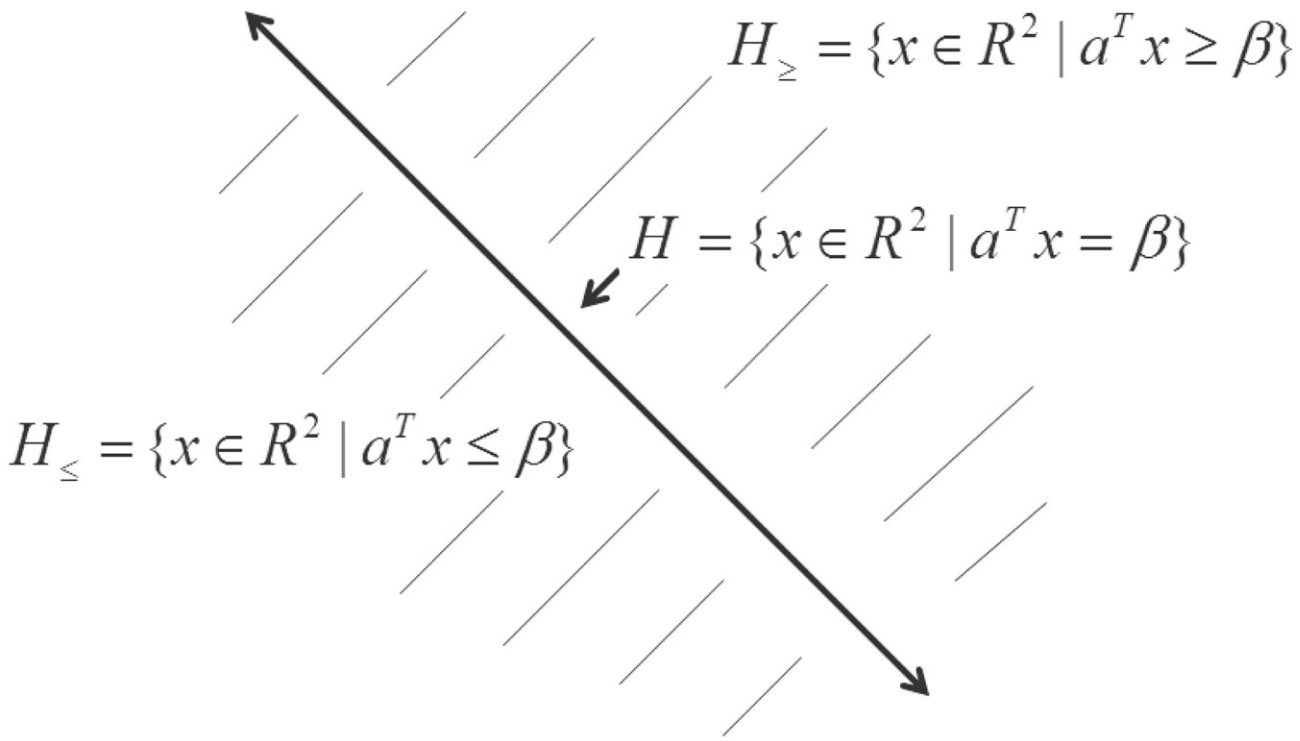

FIGURE 2.4
Hyperplane in R^2.

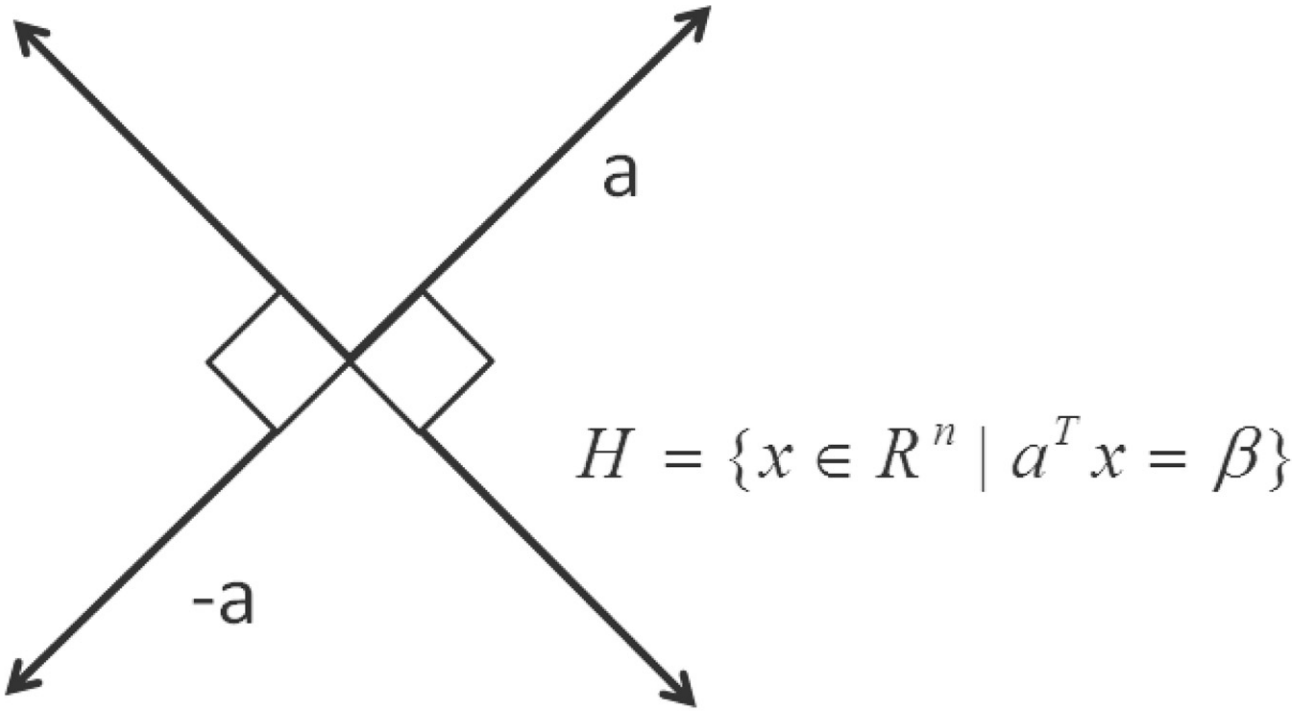

FIGURE 2.5
a and $-a$ are perpendicular to H.

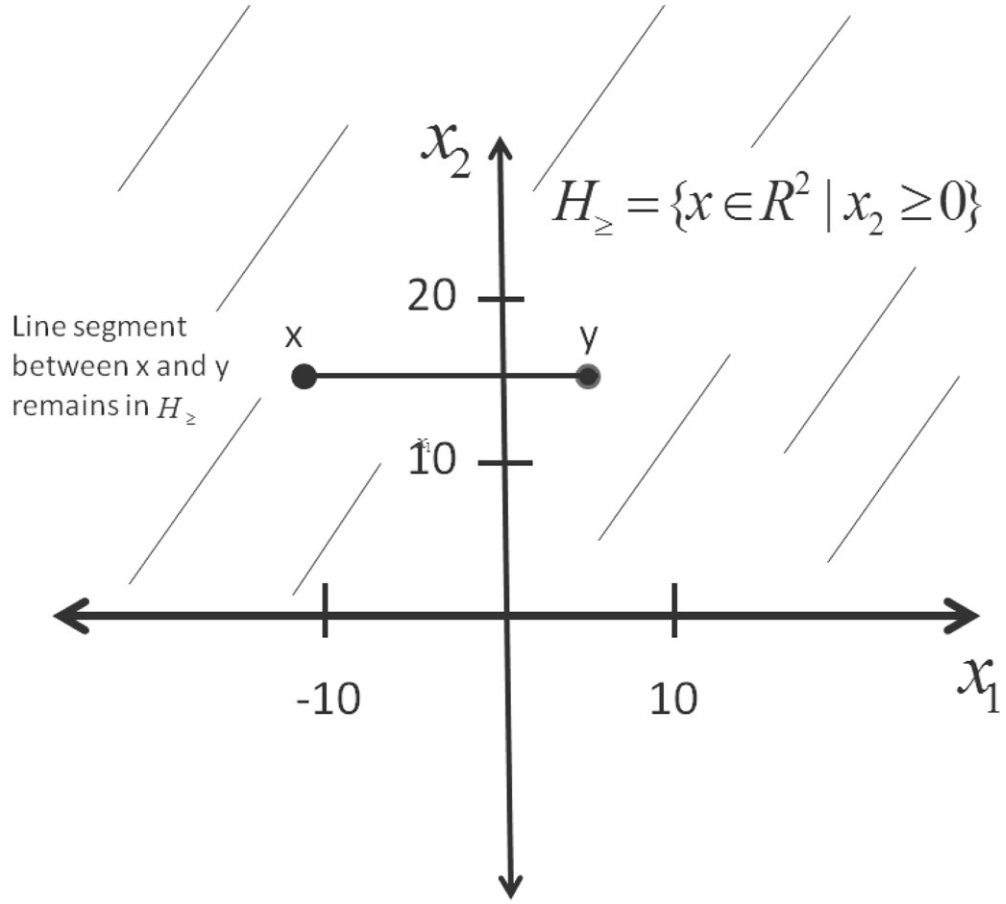

FIGURE 2.6
Convexity of $x_2 \geq 0$.

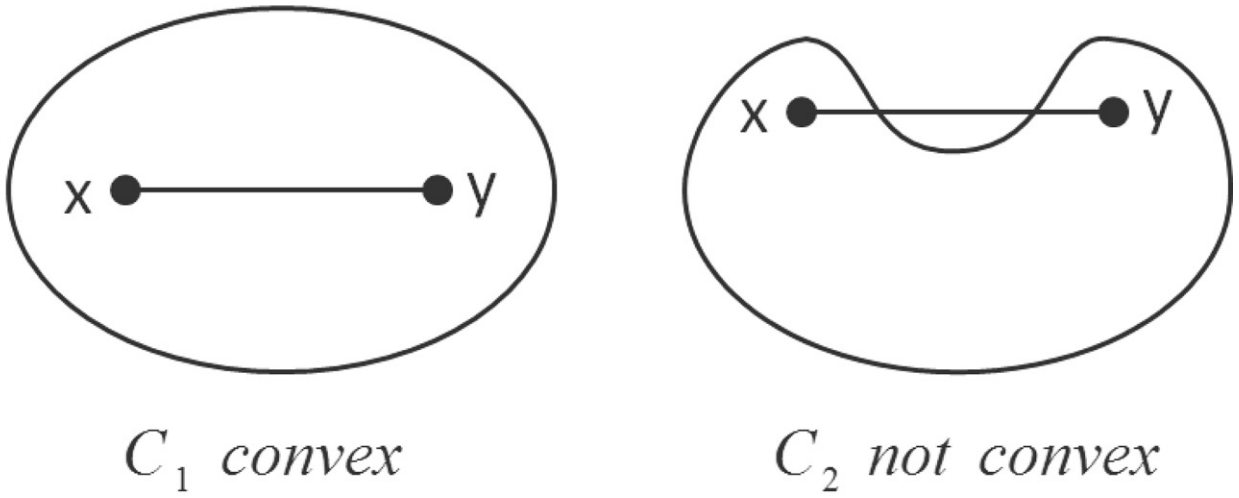

FIGURE 2.7
Convexity and non-convexity.

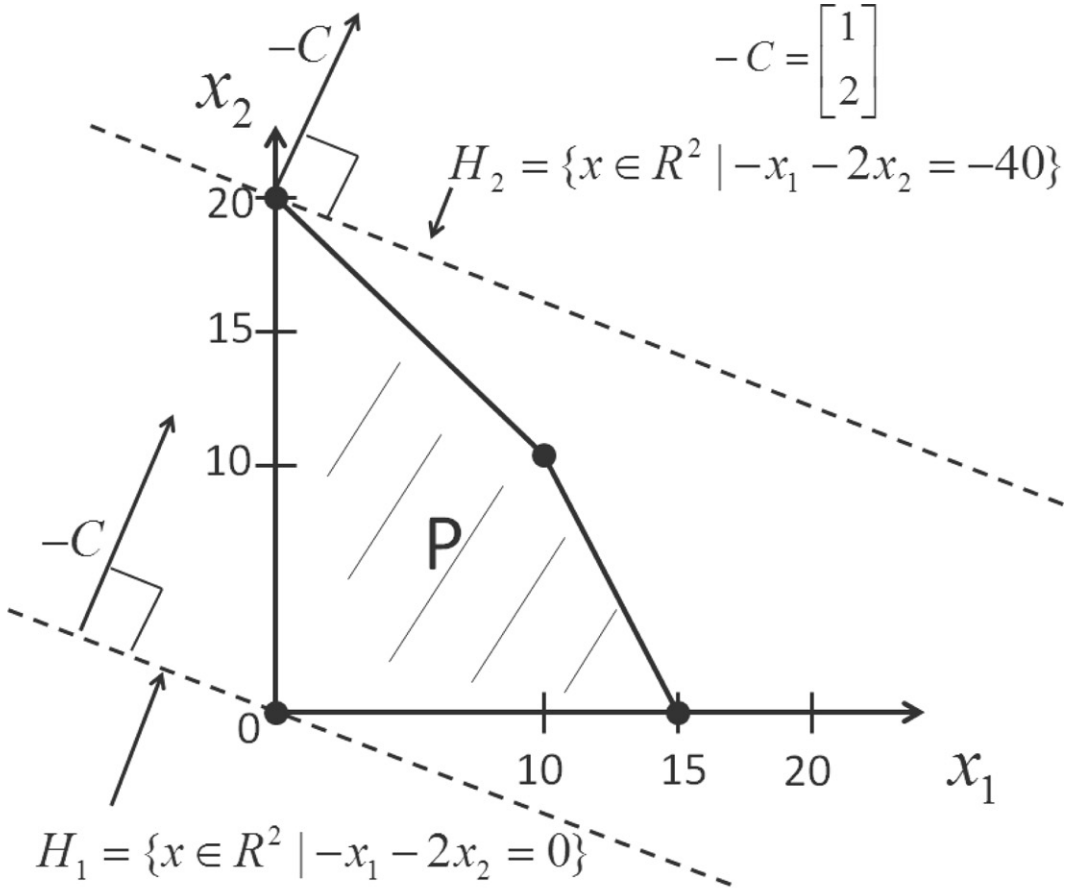

FIGURE 2.8
Hyperplane characterization of optimality for LP (2.1).

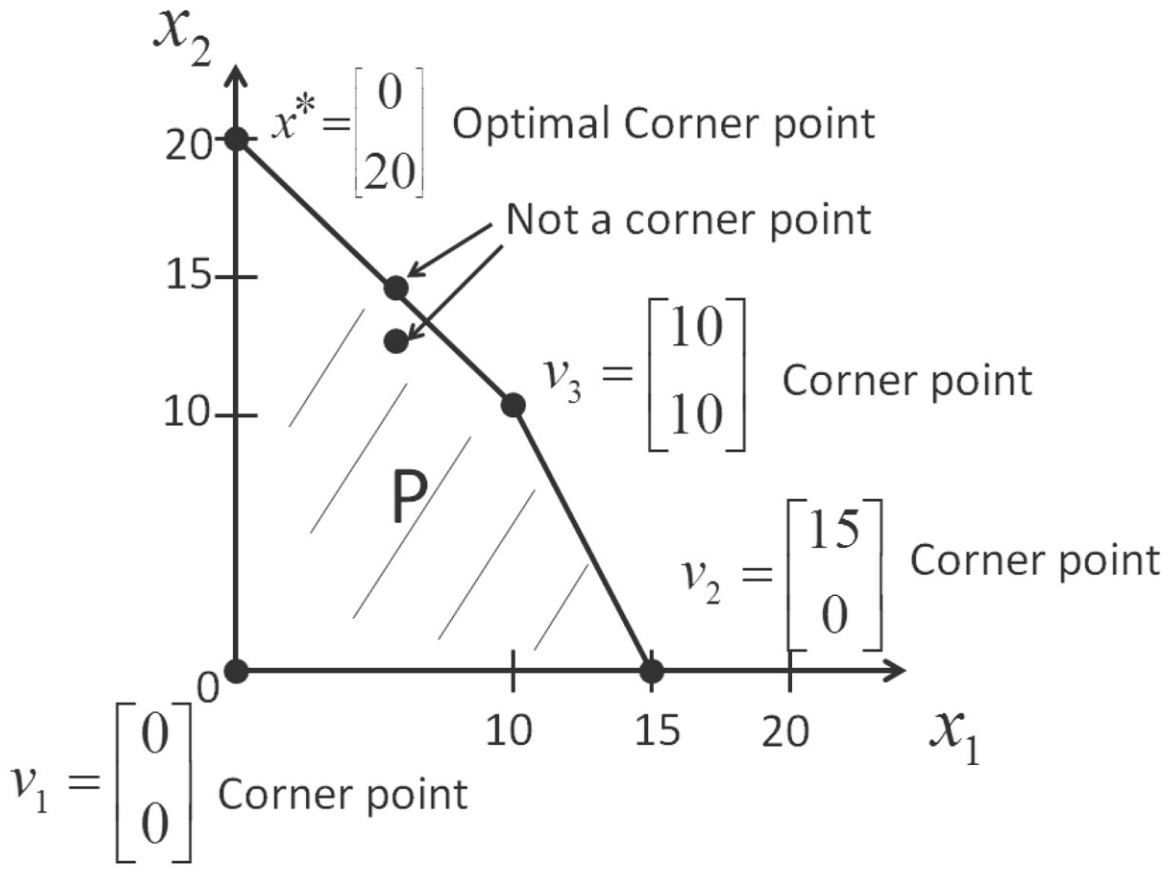

FIGURE 2.9
Corner points of feasible set of LP (2.1).

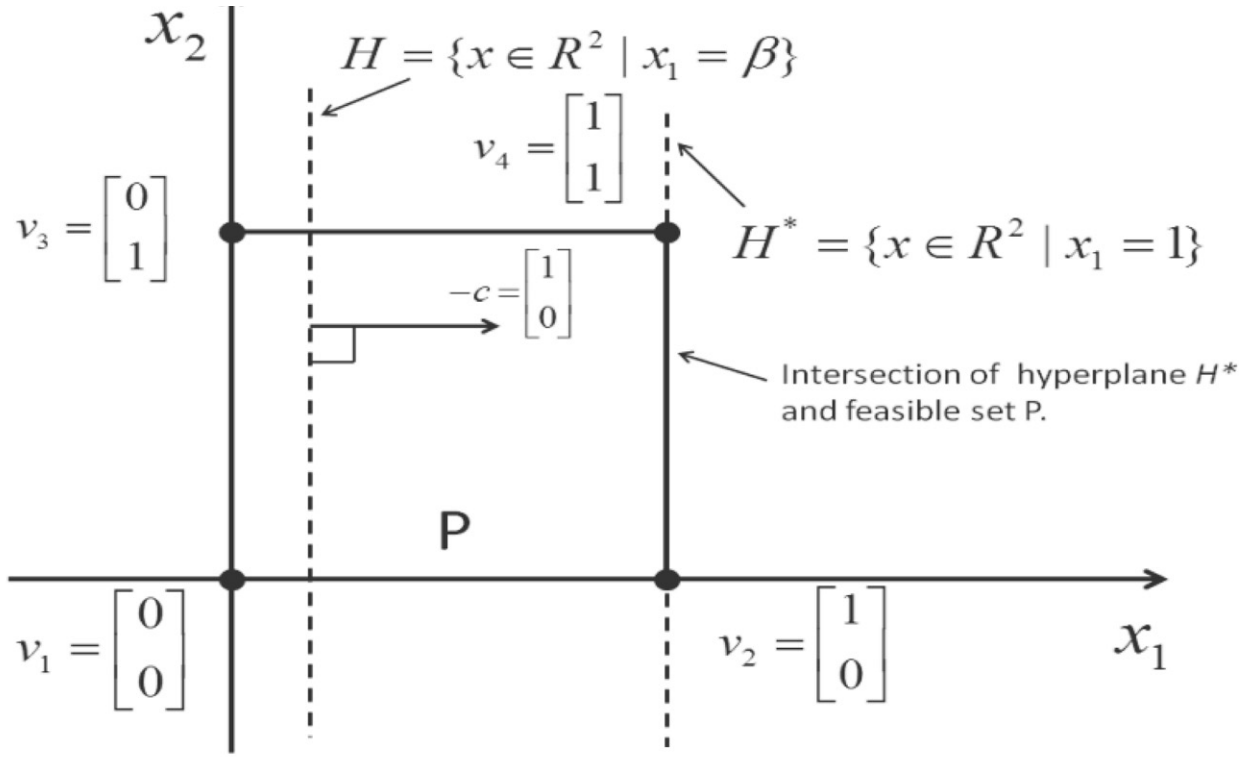

FIGURE 2.10
Hyperplane characterization of infinite optimal solutions for LP (2.2).

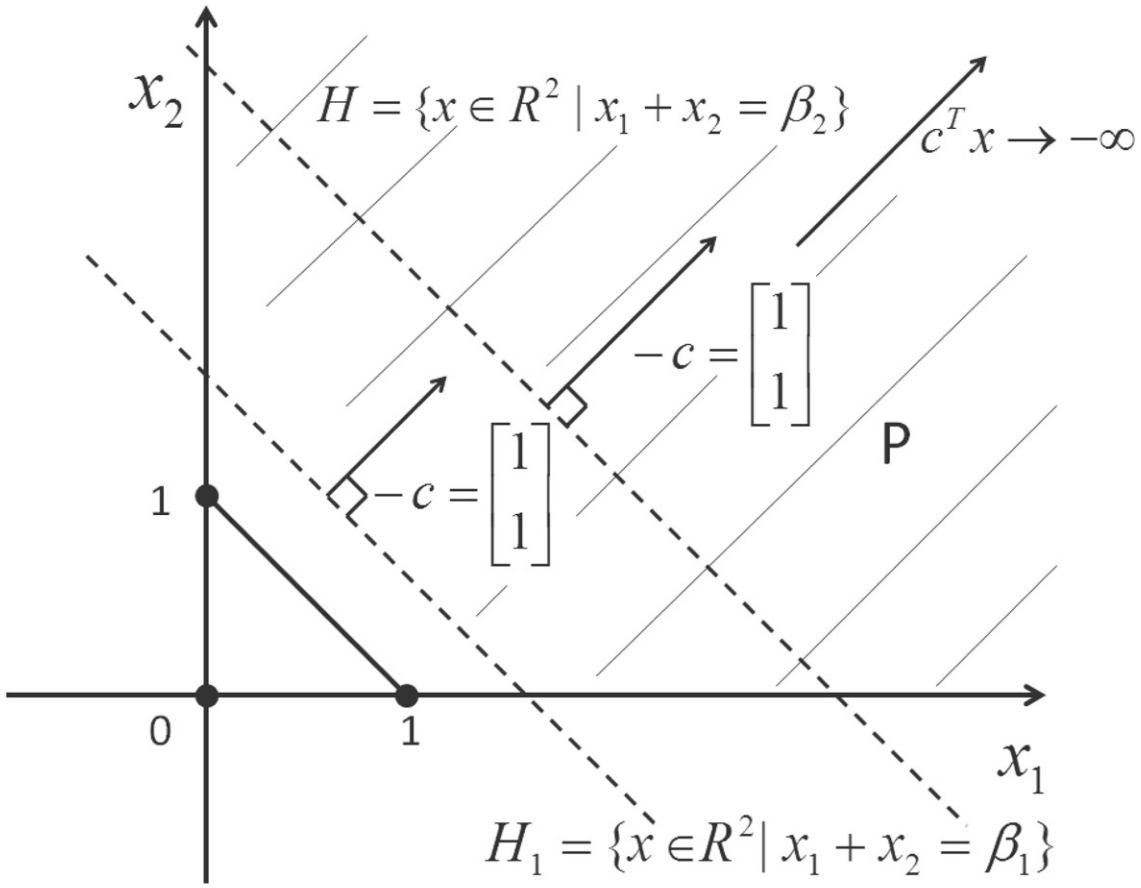

FIGURE 2.11
Unbounded LP (2.3).

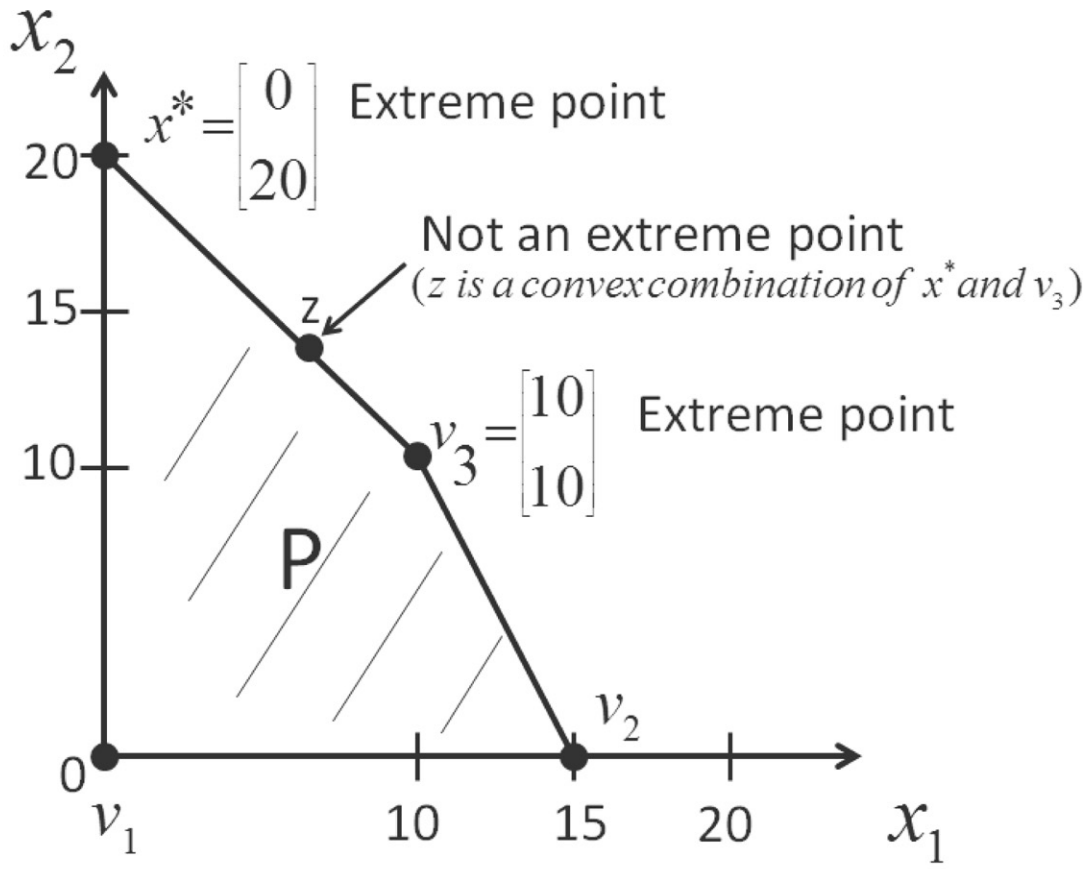

FIGURE 2.12
Extreme points of feasible set of LP (2.1).

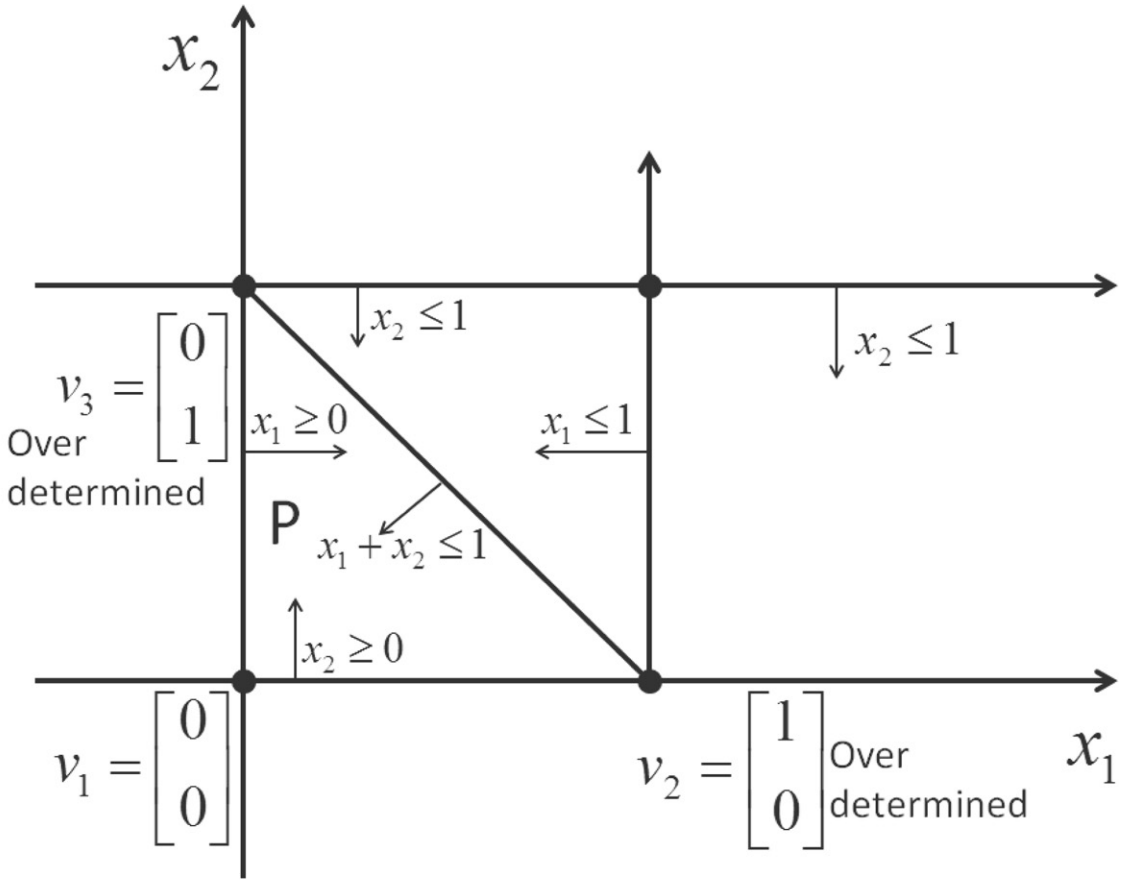

FIGURE 2.13
Feasible set (2.4).

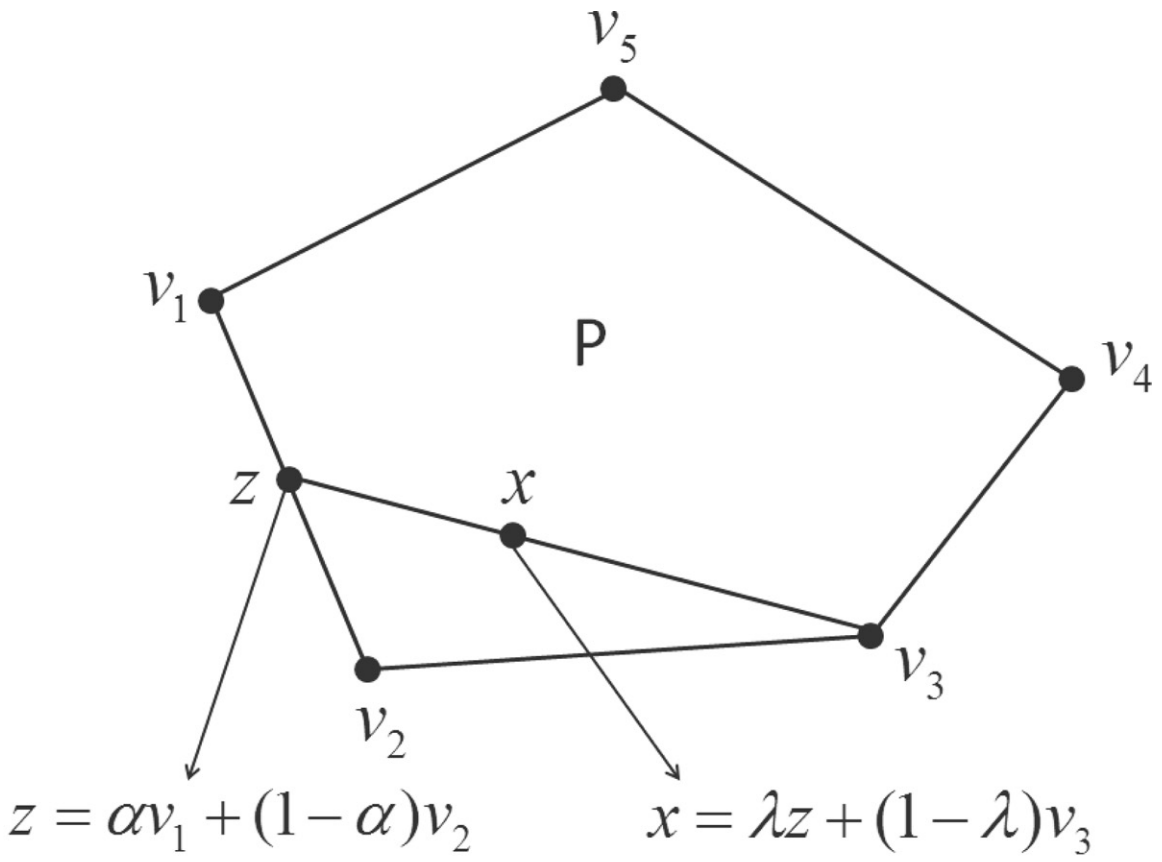

FIGURE 2.14
A polytope with 5 extreme points.

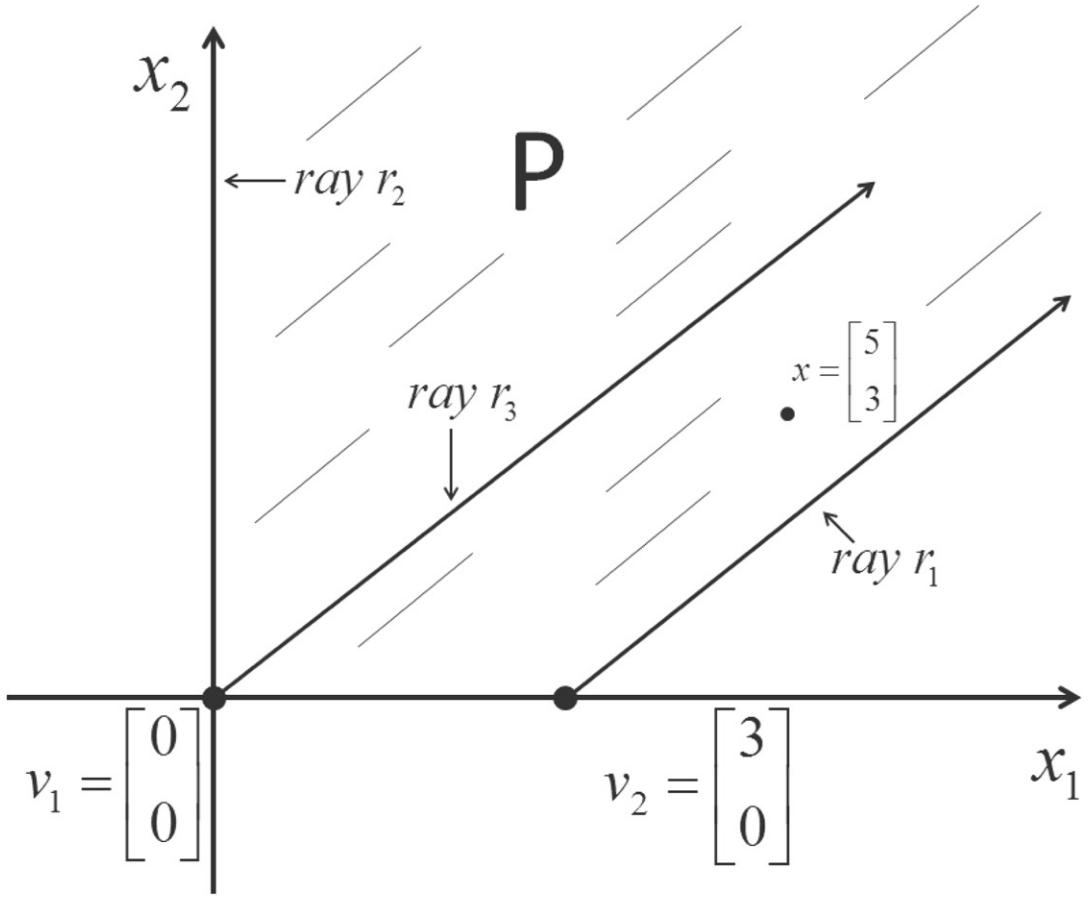

FIGURE 2.15
Some rays of feasible set (2.5).