

What is a Constrained Optimization Problem?

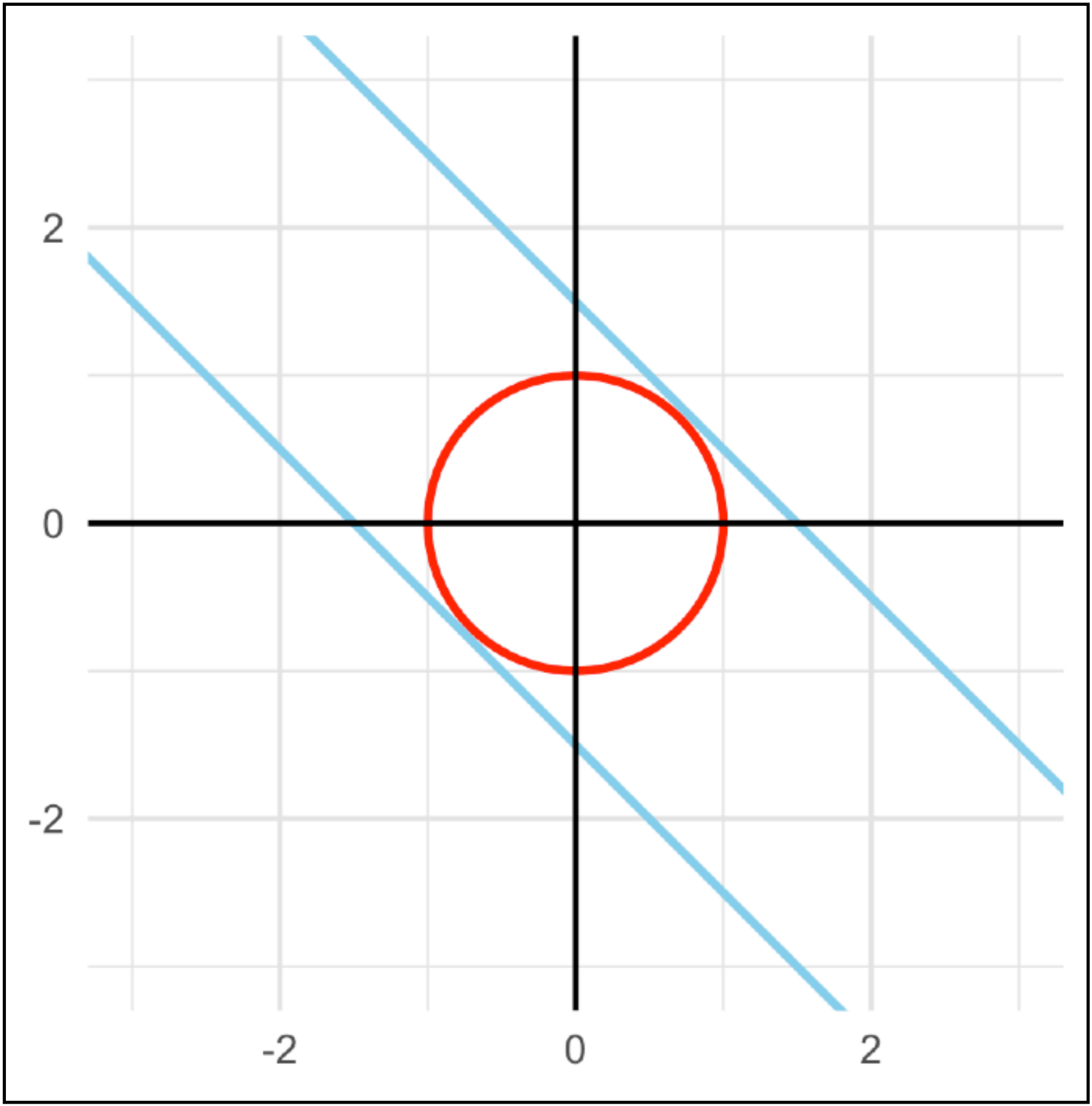
Optimize subject to

$f(x, y)$

$$g(x, y) = k$$

$$g(x,y)=x^2+y^2=1$$

$$f(x,y) = 2x + y$$





$$\max_{\beta_0, \beta_1, \dots, \beta_p} M$$

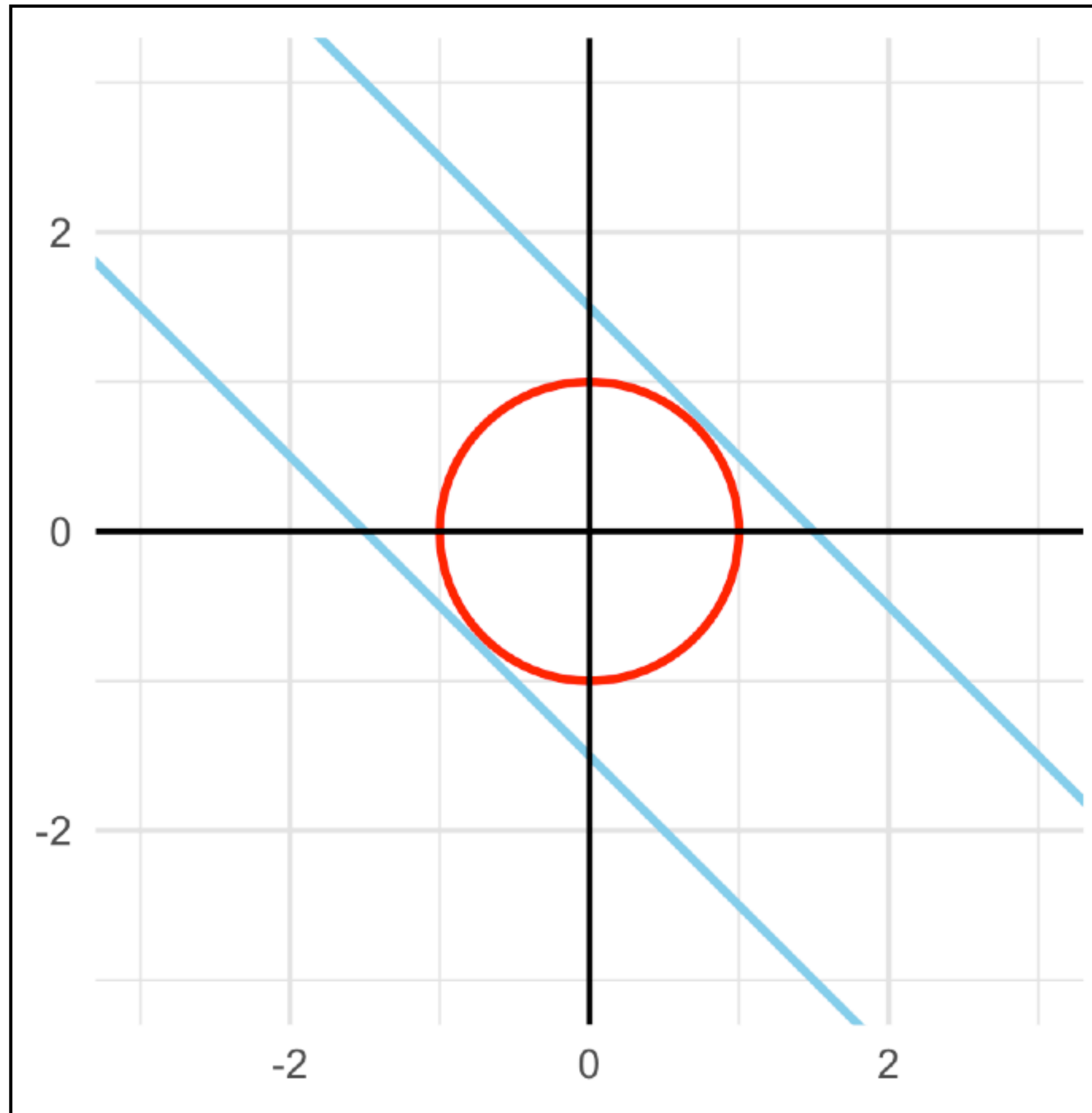
subject to:

$$\|\beta\| = 1$$

$$y_i(\beta_0 + \beta^T x_i) \geq M$$

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Optimize $f(x, y)$ subject to $g(x, y) = k$



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$$g(x, y) = x^2 + y^2 = 1$$

$$\max_{\beta_0, \beta_1, \dots, \beta_p} M$$

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The Non-Separable Case

the optimization problem for the maximal margin classifier often has no solution with $M > 0$

