x
x
$x^\top$
$\langle \cdot, \cdot \rangle$
$\|\cdot\|$
??
$\|x\|_A^2 = \langle x, Ax \rangle$
$x^1 \leq x^2$
$x^1, x^2 \in^n$
0
I
x^k
$x = (x_1, x_2, ..., x_n)^\top$
k
$K \subset$
$\{x^k\}_{k \in K}$
k
$\{x^k\}$
x
r
$B_r(x)$
$A \subset B$
A
B
$A = B$

$$\min_x f(x) s.t. x \in$$

$X \subset^n$
f
?
$f :^n \to$
subdifferential
f
$x \in^n$

$$\partial f(x) := \{g \in^n |\ f(y) - f(x) \geq g, y - x \forall y \in^n\}.$$

f
$\partial f(x) = \nabla f(x)$
?
?
$f :^n \to$
subdifferential
f
$x \in^n$

$$\partial f(x) := \left\{ g \in^n \middle| \limsup_{y \to x, h \searrow 0} \frac{f(y + hv) - f(y)}{h} \forall v \in^n \right\}.$$

?
??
??
?
$f(y) - f(x) \geq g, y - x \forall y \in^n$
?
$F(x) = \sum_i f_i(x)$

$$\partial F(x) \subset \sum_i \partial f_i(x).$$

$\mathcal{C}^1$
stationary point
x
f
?

$$0 \in \partial f(x).$$

f
ε*subdifferential*
x
ε*subgradient*
$f(x)$
$g \in^n$