

$$\begin{array}{l} x \\ x^\top \\ \langle \cdot, \cdot \rangle \\ \|\cdot\| \\ ?? \\ \|x\|_A^2 = \\ \langle x, Ax \rangle \\ x^1 \leq \\ x^2 \\ x^1, x^2 \in^n \\ Q \\ I \\ x^k = \\ (x_1, x_2, ..., x_n)^\top \end{array}$$

$$\begin{array}{l} K \subset \\ \{x^k\}_{k \in K} \\ \{x^k\} \\ \{x^k\} \end{array}$$

$$\begin{array}{l} B_r(x) \\ A \subset B \\ A \\ B = \\ \min_x f(x) s.t. x \in \\ X \subset^n \\ f \end{array}$$

$$\begin{array}{l} f : ^n \overset{?}{\rightarrow} \\ sub- \\ d- \\ if- \\ fer- \\ en- \\ tial \\ f \\ x \in^n \\ \partial f(x) := \{g \in^n | \, f(y) - f(x) \geq g, y - x \forall y \in^n \} . \end{array}$$

$$\begin{array}{l} f \\ \partial f(x) = \\ \nabla f(x) \\ ? \\ ? \\ f : ^n \rightarrow \\ sub- \\ d- \\ if- \\ fer- \\ en- \\ tial \\ f \\ x \in^n \\ \partial f(x) := \left\{g \in^n \Big| \limsup_{y \rightarrow x, h \searrow 0} \frac{f(y + hv) - f(y)}{h} \forall v \in^n \right\} . \end{array}$$

$$\begin{array}{l} ?? \\ ?? \\ ? \\ f(y)-f(x) \geq g, y-x \forall y \in^n \end{array}$$

$$\begin{array}{l} F(x) \overset{?}{=} \\ \sum_i f_i(x) \end{array}$$

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

$$\begin{array}{l} \mathcal{C}^1 \\ sta- \\ tion- \\ point \\ x \\ f \\ ? \\ 0 \in \partial f(x). \end{array}$$

$$\begin{array}{l} f \\ \varepsilon subdifferential \\ x \\ \varepsilon subgradient \\ f(x) \\ g \in^n \end{array}$$