Smooth Functions

$f(\mathbf{x})$	dom(f)	parameter	norm
$\frac{1}{2}\mathbf{x}^T\mathbf{A}\mathbf{x} + \mathbf{b}^T\mathbf{x} + c$ $(\mathbf{A} \in \mathbb{S}^n, \mathbf{b} \in \mathbb{R}^n, c \in \mathbb{R})$	$\mathbb{R}^n$	$\|\mathbf{A}\|_{p,q}$	l_p
$\langle \mathbf{b}, \mathbf{x} \rangle + c$ $(\mathbf{b} \in \mathbb{E}^*, c \in \mathbb{R})$	$\mathbb{E}$	0	any norm
$\frac{1}{2}\|\mathbf{x}\|_p^2,\ \ p \in [2, \infty)$	$\mathbb{R}^n$	$p-1$	l_p
$\sqrt{1 + \|\mathbf{x}\|_2^2}$	$\mathbb{R}^n$	1	l_2
$\log(\sum_{i=1}^n e^{x_i})$	$\mathbb{R}^n$	1	l_2, l_∞
$\frac{1}{2}d_C^2(\mathbf{x})$ $(\emptyset \neq C \subseteq \mathbb{E}$ closed convex$)$	$\mathbb{E}$	1	Euclidean
$\frac{1}{2}\|\mathbf{x}\|^2 - \frac{1}{2}d_C^2(\mathbf{x})$ $(\emptyset \neq C \subseteq \mathbb{E}$ closed convex$)$	$\mathbb{E}$	1	Euclidean
$H_\mu(\mathbf{x})\ \ (\mu > 0)$	$\mathbb{E}$	$\frac{1}{\mu}$	Euclidean

Strongly Convex Functions

$f(\mathbf{x})$	dom(f)	s.c. parameter	norm
$\frac{1}{2}\mathbf{x}^T\mathbf{A}\mathbf{x} + 2\mathbf{b}^T\mathbf{x} + c$ $(\mathbf{A} \in \mathbb{S}_{++}^n, \mathbf{b} \in \mathbb{R}^n, c \in \mathbb{R})$	$\mathbb{R}^n$	$\lambda_{\min}(\mathbf{A})$	l_2
$\frac{1}{2}\|\mathbf{x}\|^2 + \delta_C(\mathbf{x})$ $(\emptyset \neq C \subseteq \mathbb{E}$ convex$)$	C	1	Euclidean
$-\sqrt{1 - \|\mathbf{x}\|_2^2}$	$B_{\|\cdot\|_2}[\mathbf{0}, 1]$	1	l_2
$\frac{1}{2}\|\mathbf{x}\|_p^2\ \ (p \in (1, 2])$	$\mathbb{R}^n$	$p-1$	l_p
$\sum_{i=1}^n x_i \log x_i$	Δ_n	1	l_2 or l_1