Prox Calculus Rules

$f(\mathbf{x})$	$\mathrm{prox}_f(\mathbf{x})$	assumptions
$\sum_{i=1}^m f_i(\mathbf{x}_i)$	$\mathrm{prox}_{f_1}(\mathbf{x}_1) \times \cdots \times \mathrm{prox}_{f_m}(\mathbf{x}_m)$	
$g(\lambda\mathbf{x}+\mathbf{a})$	$\frac{1}{\lambda}\left[\mathrm{prox}_{\lambda^2 g}(\mathbf{a}+\lambda\mathbf{x})-\mathbf{a}\right]$	$\lambda \neq 0, \mathbf{a} \in \mathbb{E}$, g proper
$\lambda g(\mathbf{x}/\lambda)$	$\lambda \mathrm{prox}_{g/\lambda}(\mathbf{x}/\lambda)$	$\lambda \neq 0$, g proper
$g(\mathbf{x})+\frac{c}{2}\\|\mathbf{x}\\|^2+\langle \mathbf{a},\mathbf{x}\rangle+\gamma$	$\mathrm{prox}_{\frac{1}{c+1}g}(\frac{\mathbf{x}-\mathbf{a}}{c+1})$	$\mathbf{a} \in \mathbb{E}, c>0, \gamma \in \mathbb{R}$, g proper
$g(\mathcal{A}(\mathbf{x})+\mathbf{b})$	$\mathbf{x}+\frac{1}{\alpha}\mathcal{A}^T(\mathrm{prox}_{\alpha g}(\mathcal{A}(\mathbf{x})+\mathbf{b})-\mathcal{A}(\mathbf{x})-\mathbf{b})$	$\mathbf{b} \in \mathbb{R}^m$, $\mathcal{A}:\mathbb{V}\to\mathbb{R}^m$, g proper closed convex, $\mathcal{A}\circ\mathcal{A}^T=\alpha I$, $\alpha>0$
$g(\\|\mathbf{x}\\|)$	$\mathrm{prox}_g(\\|\mathbf{x}\\|)\frac{\mathbf{x}}{\\|\mathbf{x}\\|}$, $\quad \mathbf{x} \neq \mathbf{0}$ $\{\mathbf{u} : \\|\mathbf{u}\\| = \mathrm{prox}_g(0)\}$, $\quad \mathbf{x}=\mathbf{0}$	g proper closed convex, $\mathrm{dom}(g) \subseteq [0,\infty)$