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**Differentiability of the Argmin Function and a Minimum Principle
for Semiconcave Subsolutions**

Suppose $f(x, y) + \frac{\kappa}{2}\|x\|^2 - \frac{\sigma}{2}\|y\|^2$ is convex where $\kappa \geq 0, \sigma > 0$, and the argmin function $\gamma(x) = \{\gamma : \inf_y f(x, y) = f(x, \gamma)\}$ exists and is single valued. We will prove γ is differentiable almost everywhere. As an application we deduce a minimum principle for certain semiconcave subsolutions.

Keywords: Argmin function, differentiability, minimum principle, semiconcave subsolutions.

MSC: 28B20, 58C06.