

# Valadier-like formulas for the supremum function I

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© 2018 Heldermann Verlag. All rights reserved. We generalize and improve the original characterization given by Valadier [19, Theorem 1] of the subdifferential of the pointwise supremum of convex functions, involving the subdifferentials of the data functions at nearby points. We remove the continuity assumption made in that work and obtain a general formula for such a subdifferential. In particular, when the supremum is continuous at some point of its domain, but not necessarily at the reference point, we get a simpler version which gives rise to the Valadier formula. Our starting result is the characterization given in [11, Theorem 4], which uses the  $\epsilon$ -subdifferential at the reference point.