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On a generalized infimal convolution of set functions. (English summary)

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Summary: “Having in mind the ideas of J. Moreau, T. Strömberg and Á. Száz, for any function f and g of one power set $\mathcal{P}(X)$ to another $\mathcal{P}(Y)$, we define an other function $(f * g)$ of $\mathcal{P}(X)$ to $\mathcal{P}(Y)$ such that

$$(f * g)(A) = \bigcap \{f(U) \cup g(V) : A \subset U \cup V \subset X\}$$

for all $A \subset X$. Thus $(f * g)$ is a generalized infimal convolution of f and g .

“We show that if f and g preserve arbitrary unions, then $(f * g)$ also preserves arbitrary unions. Moreover, if F and G are relations on X to Y such that

$$F(x) = f(\{x\}) \quad \text{and} \quad G(x) = g(\{x\})$$

for all $x \in X$, then

$$(f * g)(A) = (F \cap G)[A]$$

for all $A \subset X$.”

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