A method to find the global optimum of a function

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ABSTRACT. This is a method to find the global optimum value of a function. It uses a generalization of the min function applied to the values of a function. I provide a method to find the x value of the global optimum.

Keywords: functions, optimization, global, global optimum

1. GLOBAL OPTIMUM VALUE

I used this formula to find the minimum of a list of values (https://math.stackexchange.com/users/232/qiaochu-yuan, n.d.).

$$(1.1) \qquad min(x_1, \ldots, x_n) = \lim_{k \to -\infty} \sqrt[k]{a_1^k + \ldots + a_n^k}$$

The extension to the values of a function for its domain from $-\infty, \infty$ is:

$$(1.2) \qquad min(f(x)) = \lim_{k \to -\infty} \left(\int_{-\infty}^{\infty} f(x)^k dx \right)^{1/k}$$

This formula can find the global optimum value of a function if you can evaluate it symbolically. If you can't, you can also evaluate it numerically to approximate the global optimum value.

2. GLOBAL OPTIMUM

The global optimum's x value is at:

$$(2.1) \qquad \pm \lim_{k \to \infty} min((f(x) - min(f(x)) * k + |x|)$$

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references

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