

# Generalized Cauchy difference equations

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## Abstract

In this introductory lecture on functional equations, as examples of Cauchy difference equations, there will be a mention of  $f(x + y) - f(x) - f(y) = f(1/x + 1/y)$  satisfied by the function  $f(x) = \log x$  and  $f(x + y) - f(x) - f(y) = g(xy)$  satisfied by  $f(x) = x^2$  and  $g(x) = 2x$ . The first question is whether we have all solutions of the first equation and the second equation. A more serious question is whether some general method can be devised for solving other equations of this type.