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8. $f(x) + g(y) = h(x + y)$.

Pexider's equation. Here, the functions $f(x)$, $g(y)$, and $h(z)$ are unknown.

Solution:

$$f(x) = C_1 x + C_2, \qquad g(y) = C_1 y + C_3, \qquad h(z) = C_1 z + C_2 + C_3,$$

where C_1, C_2, and C_3 are arbitrary constants.

Reference

Aczél, J. and Dhombres, J., *Functional Equations in Several Variables*, Cambridge Univ. Press, Cambridge, 1989.

Pexider's Equation