**2.  $y'_x = f(x)g(y)$.**

*Separable equation.*

Solution:

$$\int \frac{dy}{g(y)} = \int f(x)\,dx + C,$$

where $C$ is an arbitrary constant.

Particular solutions: $y = A_k$, where the $A_k$ are roots of the algebraic (transcendental) equation $g(A_k) = 0$.

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