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9. $\quad y''_{xx} = x^{k-2} f(x^{-k} y).$

Second-order generalized homogeneous equation. The transformation $z = x^{-k} y$, $w = x y'_x / y$ leads to a first-order equation: $z(w - k) w'_z = z^{-1} f(z) + w - w^2$.

References

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