Technique of Lazarus Fuchs
for Solving Rational First-Order Differential Equations
Roger Chalkley, December 26, 2014

I discovered in 1993 that there are numerous first-order differential for which the DSolve
command of Mathematica is not helpful even though the equations can be transformed to
a more amenable form by a transformation that Lazarus Fuchs described in 1884. For a
modern presentation showing how to use the transformation of Lazarus Fuchs with numerous
examples, see my paper titled Lazarus Fuchs’ Transformation for Solving Rational First-
pages 961-985, of which a copy may be obtained by clicking here. In particular, page 983 of
this paper lists 132 first-order algebraic differential equations for which the transformation
of Lazarus Fuchs is quite useful even though the DSolve command of Mathematica provides
no help at all.