A general analytic solution for the B-field produced at all points in space by a solenoid of arbitrary length EDWARD BUTTERWORTH, Texas A&M University-Kingsville — The cleanest way to a general and easily programmable analytic solution for the magnetic field of a cylindrical solenoid is to determine the functional form of the closed level curve of the field through any arbitrary point in space. The length of the curve is then determined by integration, and the field strength follows from a direct application of Ampere's circuital law. The two limiting cases (the infinitely long solenoid and single current loop) may serve as guides in this operation. The functional form of the level curves may be found using a conformal transformation, provided the three dimensional character of the solenoid is adequately assessed.

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