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Further remarks on formal power series

Abstract: In this paper, we present a considerable simplification of the proof of a theorem by Gan and Knox, stating a sufficient and necessary condition for existence of a composition of two formal power series. Then, we consider the behavior of such series and their (formal) derivatives at the boundary of the convergence circle, obtaining in particular a theorem of Bugajewski and Gan concerning the structure of the set of points where a formal power series is convergent with all its derivatives.

References

[1] Bugajewski D., Gan X.-X., *A note on formal power series*, Comment. Math. Univ. Carolin. **51** (2010), no. 4, 595–604.

[2] Bugajewski D., Gan X.-X., *On formal Laurent series*, Bull. Braz. Math. Soc., New Series **42** (2011), no. 3, 415–437.

[3] Gan X.-X., Knox N., *On composition of formal power series*, Int. J. Math. Math. Sci. **30** (2002), no. 12, 761–770.

[4] Herzog F., Piranian, G., *Sets of convergence of Taylor series I*, Duke Math. J. **16** (1949), 529–534.

[5] Lang S., *Complex Analysis*, Springer, 4th edition, New York, 1999.