Bonus

Due on November 23, 2010

(Cf. [1, Ex. 5.7]) Establish the following properties of infinite products.

(a) Find an example of a sequence of complex numbers $\{a_n\}$ such that $\sum a_n$ converges but $\prod(1 + a_n)$ diverges (and is non-zero).

(b) Also find an example such that $\prod(1 + a_n)$ converges to a non-zero number and $\sum a_n$ diverges.

References

[1] E. Stein and R. Shakarchi, *Complex analysis*. Princeton Lectures in Analysis, II. Princeton University Press, Princeton, NJ, 2003.