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Assignment 4
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Problem 7.2.4 in Chung

4 Prove the sufficiency part of Theorem 7.2.1 without using Theorem 7.1.2, but by elaborating the proof of the latter. [Hint: Use the expansion

$$e^{itx} = 1 + itx + \theta\frac{(tx)^2}{2} \quad \text{for } |x| > \eta$$

and

$$e^{itx} = 1 + itx - \frac{(tx)^2}{2} + \theta'\frac{|tx|^3}{6} \quad \text{for } |x| \leq \eta$$

As a matter of fact, Lindeberg's original proof does not even use ch.f.'s; see Feller [13, vol.2].]

Proof. From pg. 179 in Chung, θ and θ' denote a "generic" complex number of modulus ≤ 1. □