EXERCICES:

SHEET 6.

Exercice 1 ((ii) is easier than (i))

(i) Assume $|B_n| \leq A n^D$. Prove that

$$\limsup_{n\to\infty} \frac{|X_n|}{\sqrt{n \log n}} \leq \sqrt{D+1} \quad \mathbb{P}_o\text{-a.s.}$$

(ii) Assume $|B_n| \leq A e^{Cn^\alpha}$. Prove that

$$\limsup_{n\to\infty} \frac{|X_n|}{n^{1/(2-\alpha)}} \leq (2C)^{1/(2-\alpha)}$$

(iii) Assume that G has sub-exponential growth. Prove that

$$\frac{|X_n|}{n} \xrightarrow[n\to\infty]{} 0 \quad \mathbb{P}_o \text{ a.s.}$$