

Department of Mathematics
MTL 106 (Introduction to Probability Theory and Stochastic Processes)
Tutorial Sheet No. 6
Answer for Selected Problems

9. (a) No (b) Yes
10. $\alpha < \frac{1}{2}$
11. $\frac{24}{25}$
12. (a) The relative frequency of 0's approaches 0.1 (b) 18000
13. No
15. $e^{\frac{t^2}{2}}$
16. 162
17. (a) 2.95×10^{-5} (b) 3.6×10^{-3}
18. 0.0228
19. 66358
20. 6766
- 21.

$$X_n \xrightarrow{P} 0 \quad \text{for all } k,$$

$$X_n \xrightarrow{d} 0 \quad \text{for all } k,$$

$$X_n \xrightarrow{L^p} 0 \iff k < \frac{1}{p},$$

$$X_n \xrightarrow{a.s.} 0 \iff k < 0 \quad (\text{assuming independence}).$$

27. 0.75
28. $\sqrt{2} \left(t - \frac{1}{2} \right)$
29. Standard Normal distribution ($N(0, 1)$)