3. $\{Y_t\}$ be a stationary process with mean zero, variance $\gamma_0 = 6^2$ and autocovariance function $\gamma_k = 6^2(-\frac{1}{2})^k$.

(a) Autocorrelat fun for $\{Y_t\}$!

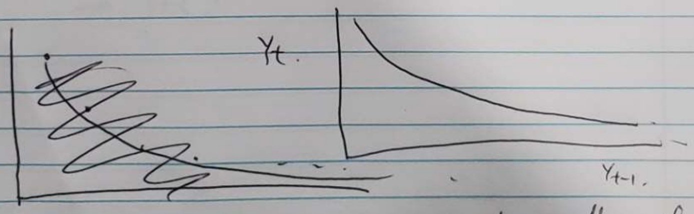
$$Corr(Y_t, Y_s) = \frac{Cov(Y_t, Y_{t+k})}{\sqrt{Var(Y_t)Var(Y_s)}} = \frac{6^2(-\frac{1}{2})^k}{\sqrt{6^2 \times 6^2}}$$

$$\begin{cases} 1 & \text{if lag } k = 0 \ (t=s) \\ (-\frac{1}{2})^k \end{cases}$$

(b) Draw what you think of Y_t vs. Y_{t-1} might look like. Explain reasoning.

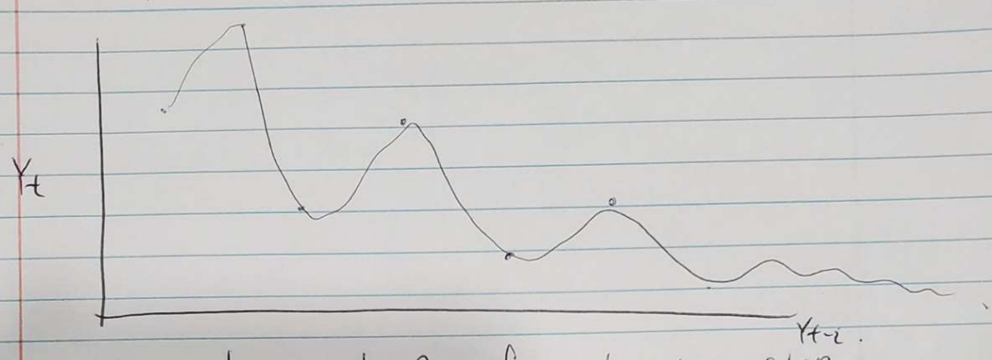
Y_t vs $Y_{t-1} \Rightarrow k = 1$

$Corr = (-\frac{1}{2})$.



~~becau~~ It would get smaller if start with positive number, becau correlation is $(-\frac{1}{2})$ when $k=1$

(c). Y_t vs Y_{t-2}.



because $k=2$. for each two-step, the value would be affected by $(-\frac{1}{4})$

However, adjacent value would not be affected

(ex) Y_x , Y_{x-1})