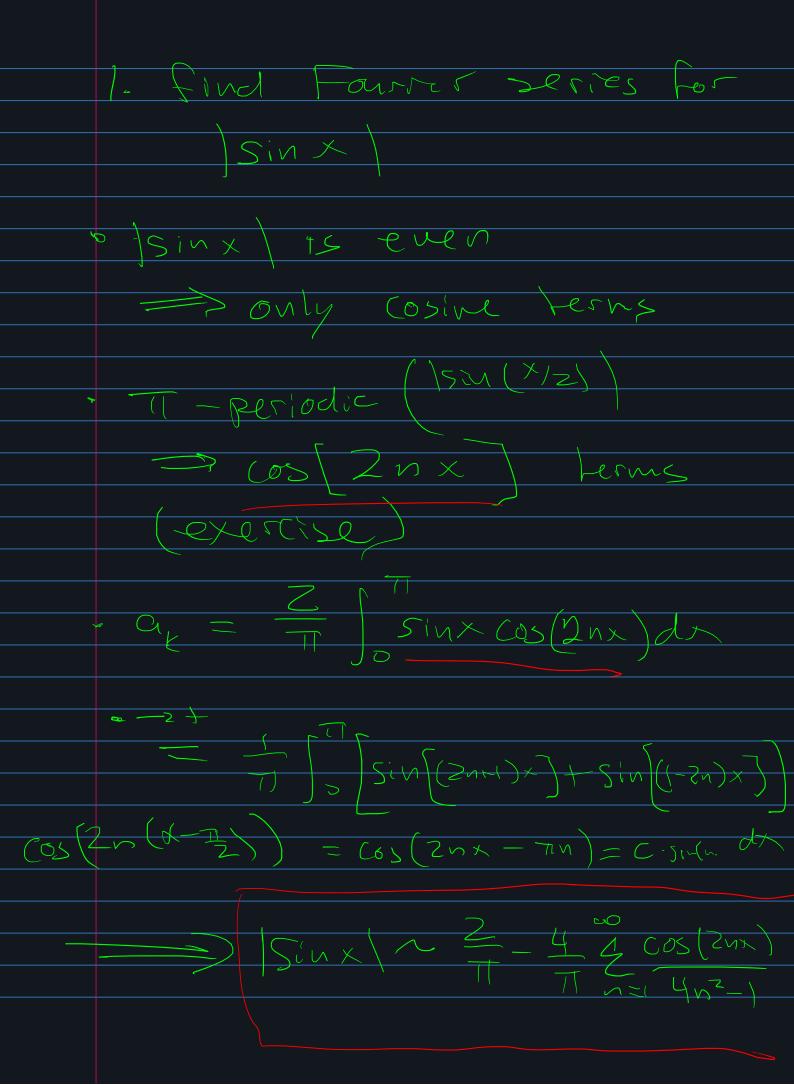
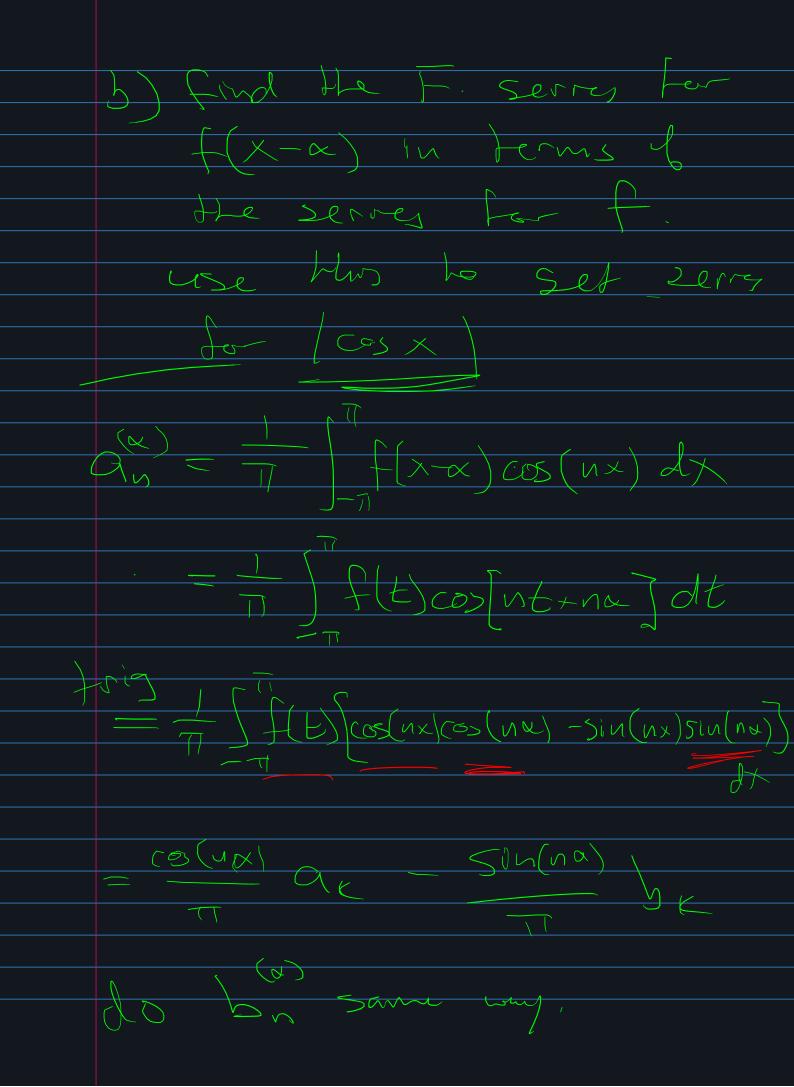
6. Let
$$f: \mathbb{R} \to \mathbb{R}$$
 be 2π -periodic and Riemann integrable on $[-\pi, \pi]$. Prove that $\lim_{x \to 0} \int_{-\pi}^{\pi} |f(x+t) - f(t)|^2 dt = 0$.

Claim: $\{x, (\pm) := \{x + \pm\}\}$ by $\{-\pi, \pi\}$ by $\{$





(b) Show 9 -> 8 Cel FE R GIZM 4 Show $g(t) = \int_{0}^{2\pi} f(x) \sin(tx) dx$ is unitly cts on IP. PP: 3(5)-5(t) 12 5mall when (5-t) 5mall |S(s)-S(t)| = |S(n(sx)-sm(b))| $|Sm_X - Siny| \in |X-y|$ $\leq ||E||_{\infty} \cdot 2\pi |S-E|$ Lips Chr. $f(x) = \frac{2}{\sqrt{2}} \times \sin(n^2x)$ converges pture le a ct fr