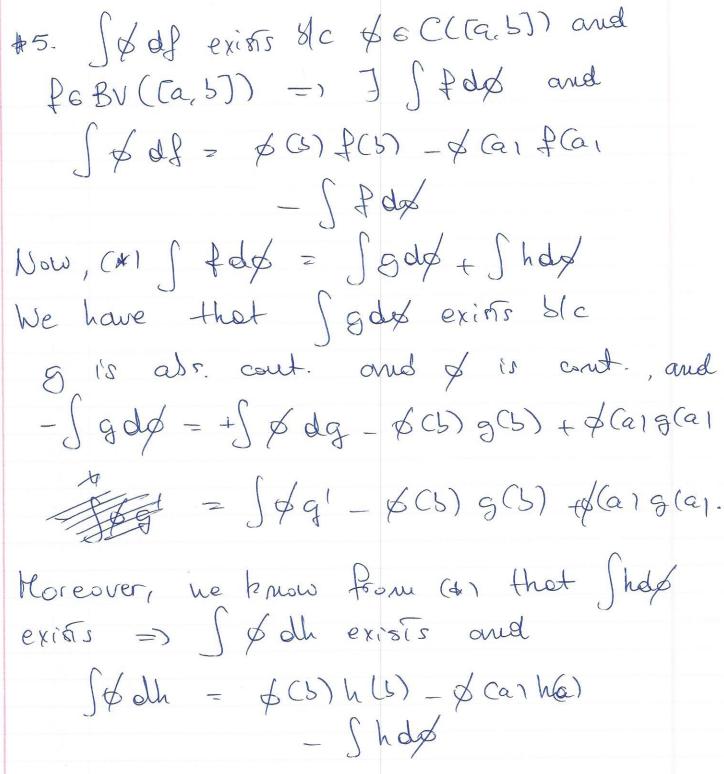
#2. =)

(=1 Show first that $|a-b|^p \leq 2^{p-1} (|a|^p + |b|^p)$ $\forall a_1b \in \mathbb{R}$

Apply the inequality to $[f_b - f]^p$ and there apply (after proving it) Problem # 23 on p. 110. #4. (a) f(x) cos(+x)_, f(x) cos(+ox) If (x) cos(+x) = If(x), fel Apply Lesesque dominated convergence. (b) Assume & = X(a,b) $\left|\int_{a}^{s} \cos tx\right| = \left|\int_{a}^{s} \sin tx\right|_{a}^{s}$ $= \left| \frac{\sin 5x - \sin ax}{+} \right| \leq \frac{2}{+} \xrightarrow{>} 0$ Let fol'(R) = 1 F sol(CR), simple function st. Uf-sU, < E/2 $\left| \int f(x) \cos(tx) dx \right| \leq \int |f(x) - s(x)| |\cos tx|$ + (s(x) cos (tx) < Uf-21, + ((scx) cos (+x) < \(\xeta_1 + \xeta_2 \) \(\xeta_2 + \xeta_2 \)



Combining we get $\int \phi df = \phi(5)f(5) - \phi(a)f(a) + \int \phi g(5)$ $-\phi(5)g(5) + \phi(a)g(a) + \int \phi dh$ $-\phi(5)h(5) + \phi(a)h(a)$ $= \int \phi g(5) + \int \phi dh$