1. GIVEN: Δ LOAD $4+j3\,\Omega$

$V_L = 480\ V$

FIND: A) pf

B) P_T, Q_T, $|S_T|$

SOLN: A) pf IS $\cos(\underbrace{\theta_V - \theta_I}_{\text{ANGLE OF } Z\,!})$

pf = 0.8 LAG

B) $I_\phi = \dfrac{V_\phi}{Z} = \dfrac{480}{4+j3}$

$|I_\phi| = 96\ A$

$I_L = \sqrt{3}\, I_\phi = 166.3\ A$

$S_T = V_L I_L = 79.8\ KVA$

$P_T = S\,pf = 63.85\ KW$

$Q_T = \sqrt{S^2 - P^2} = 47.89\ KVAR$

2. NEED CAPACITACE TO YIELD $Q = -47.89 \text{KVAR}$

PER ϕ ... $Q = \frac{V^2}{X_c}$

$$\frac{47.89\text{K}}{3} = \frac{480^2}{X_c}$$

$$X_c = \underline{14.43\ \Omega}$$

AND $X_c = \frac{1}{\omega C}$ Assume $\omega = 377$

$$C = \underline{184\ \mu F}$$

3. $P_T = 63.85\ \text{KW}$

$Q_T = 0\ !$

$S_T = 63.85\ \text{KVA}$

BONUS: IN 1) $I_L = \underline{166.3A}$

IN 3) $S = V_L I_L$ $\therefore I_L = \underline{133\ A}$