EE 330 Energy Systems (Fall 2026)
Homework 5
Wednesday, October 7, 2026

1) 3-9 modified so that the apparent power is 360 kVA and the voltages are 13.8/2.4 kV_{rms}. Tabulate answers (e.g., col. 1 connection, col. 2 high side phase voltage, col. 3 low side phase voltage, …). Hint: The voltages given are the line-to-line values coming in/out of the 3ϕ transformer.
2) 3-10ab Hint: The measured current & voltage are line values measured on the 3ϕ transformer. The measured power is for the entire 3ϕ transformer.
3) 3-11cab Do part c first. Then, complete parts a & b assuming the load is getting the full rated secondary voltage at 0°.
4) 3-12
5) 3-18
6) 3-19 To get consistent results, assume that the primary phase voltages are $\overline{V}_{an} = V_{\phi P} \angle 0°$, $\overline{V}_{bn} = V_{\phi P} \angle -120°$, and $\overline{V}_{cn} = V_{\phi P} \angle 120°$. As part of demonstrating the 30° lag, find the corresponding line-to-line secondary voltages $\overline{V}_{a'b'}$, $\overline{V}_{b'c'}$, and $\overline{V}_{c'a'}$ in terms of $V_{\phi P}$ and turns ratio a of the individual transformers and compare them to the primary line-to-line voltages $\overline{V}_{ab}$, $\overline{V}_{bc}$, and $\overline{V}_{ca}$.

Due Wednesday, October 14, 2026.