11.14. The machine of Problem 11.6 is delivering a real power input of 0.77 per unit to the infinite bus at a voltage of 1.0 per unit. The generator excitation voltage is \( E' = 1.25 \) per unit. Use `eacpower(\( P_m, E, V, X \))` to find
(a) The maximum power input that can be added without loss of synchronism.
(b) Repeat (a) with zero initial power input. Assume the generator internal voltage remains constant at the value computed in (a).

11.15. The machine of Problem 11.6 is delivering a real power input of 0.77 per unit to the infinite bus at a voltage of 1.0 per unit. The generator excitation voltage is \( E' = 1.25 \) per unit.
(a) A temporary three-phase fault occurs at the sending end of one of the transmission lines. When the fault is cleared, both lines are intact. Using equal area criterion, determine the critical clearing angle and the critical fault clearing time. Use `eafault(\( P_m, E, V, X_1, X_2, X_3 \))` to check the result and to display the power-angle plot.
(b) A three-phase fault occurs at the middle of one of the lines, the fault is cleared, and the faulted line is isolated. Determine the critical clearing angle. Use `eafault(\( P_m, E, V, X_1, X_2, X_3 \))` to check the results and to display the power-angle plot.

11.16. The machine of Problem 11.6 is delivering a real power input of 0.77 per unit to the infinite bus at a voltage of 1.0 per unit. The generator excitation voltage is \( E' = 1.25 \) per unit. A three-phase fault at the middle of one line is cleared by isolating the faulted circuit simultaneously at both ends.
(a) The fault is cleared in 0.2 second. Obtain the numerical solution of the swing equation for 1.5 seconds. Select one of the functions `swingmeu`, `swingrk2`, or `swingrk4`.
(b) Repeat the simulation and obtain the swing plots when fault is cleared in 0.4 second, and for the critical clearing time.

11.17. Consider the power system network of Example 11.7 with the described operating condition. A three-phase fault occurs on line 1–5 near bus 5 and is cleared by the simultaneous opening of breakers at both ends of the line. Using the `trstab` program, perform a transient stability analysis. Determine the system stability for
(a) When the fault is cleared in 0.2 second
(b) When the fault is cleared in 0.4 second
(c) Repeat the simulation to determine the critical clearing time.