AAE 190 Homework #2
Stall speed of a light twin-engine general aviation aircraft
⇒ Due Tuesday, 9/25/01 ⇐

The following assignment **must be done using MATLAB**.

Assume that the lift curve (plot of lift coefficient (C_L) versus angle of attack (α)) for the Cessna 402b is as shown on the next page. Calculate the **stall speed in knots** for flap deflections (δ_f) of 0, 15, and 27 degrees. Recall that the maximum takeoff weight (W) of the Cessna 402b is 6300 pounds and that the relationship between C_{Lmax} and stall speed is given by

$$C_{Lmax}=W/(.5\rho V_{stall}^2 S)$$

Be careful to use consistent dimensions in the above equation. Assume standard sea air density (ρ=0.002378 slugs per cubic foot) and a wing area (S) of 255.8 square feet.

You may want to start with the MATLAB code we talked about in class. That code can be found at the following web address.
http://roger.ecn.purdue.edu/~andrisan/Courses/AAE190_Fall_2001/Cessna402b.m

Hand in the following

1. one sheet of paper that summarized your results,
2. a copy of your MATLAB script (the MATLAB file containing your MATLAB code),
3. and the output produced by MATLAB when you run your script (from the MATLAB command window).

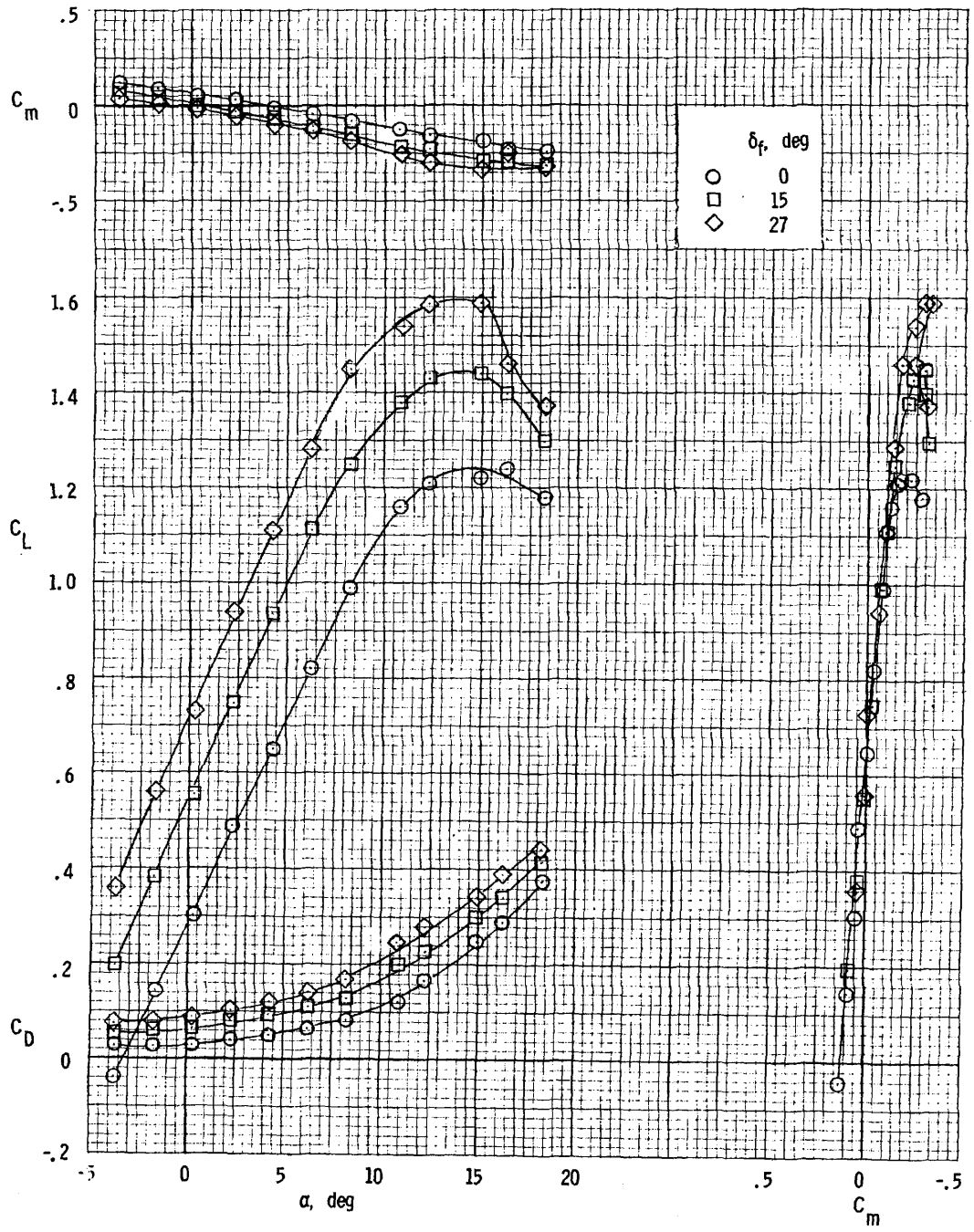

Figure 4.- Longitudinal aerodynamic characteristics of airplane with propellers removed for several flap deflections.