"When will we ever use this math?"

Instructions: answer the question showing work neat, sequenced, justify each step of your procedure with the appropriate Properties. Round your final result to the nearest hundredth; show the appropriate units. BONUS: using dimensional analysis prove the units of your answer. Attach your solution (on graph paper) to this page.

A Boeing 787-8 with a total weight of 500,000 lbs is cruising at 35,000 ft. at a speed of 827 ft./s. The 787-8 has a wing area (S) of 3501 ft². The density $\rho = 0.0007382 \frac{slug}{ft^3}$. What is the value of the cruise lift coefficient, C_L?

a) Solve the equation below for C_L

b) Determine the cruise lift coefficient

LIFT EQUATION

The Lift Force (L) on a body in the air is:

$L = \frac{1}{2}\rho V^2 S C_L$, where:

L = lift force

ρ = density of air

S = wing surface area

C_L = cruise lift coefficient