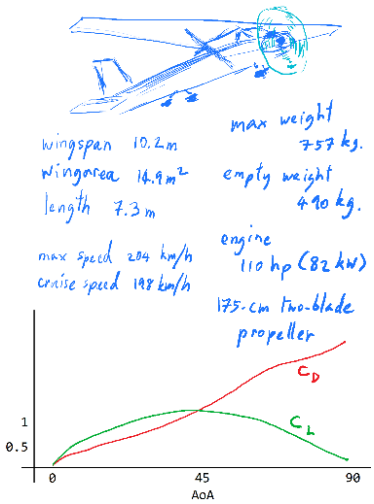
P10. A flying of an aircraft can be simply explained through 4 forces: lift, weight, thrust, and drag. Lift is a force pushing an aircraft up against its weight.

Write a program to estimate a power to fly a plane at cruising speed: ask a user to input (1) drag coefficient C_D, (2) lift coefficient C_L, (3) air density ρ, (4) plane cross-section area A, (5) wing area S, and (6) plane weight m then calculate speed v to sustain the flight altitude and power required to fly in such a condition and report the power in both watt and horse power. Note: (1) *power = thrust * v*; (2) *thrust* ≈ *drag* (at constant speed); (3) $drag = C_D\ (0.5\ \rho\ v^2)\ A$; (4) at constant flight altitude *lift = weight*; (5) $weight = m\ g$ and $g = 9.8\ m/s^2$; and (6) $lift = C_L\ (0.5\ \rho\ v^2)\ S$.



Hint: (1) find v from lift = weight: $C_L\ (0.5\ \rho\ v^2)\ S = m\ g$;

(2) find drag: $drag = C_D\ (0.5\ \rho\ v^2)\ A$;

(3) find thrust: thrush = drag;

(4) find power: power = thrust * v.

1 watt is approx. 0.00136 horse power.

Example

```
================================================================
CD: 0.6
CL: 1.2
air density: 0.41
cross-section area: 3.3
wing area: 14.9
plane weight: 520
power = 21,041.71 W. = 28.62 hp.
================================================================
```

Use `P10_template.py`. (The template is only to allow smooth autograding.)