Thrust Available:

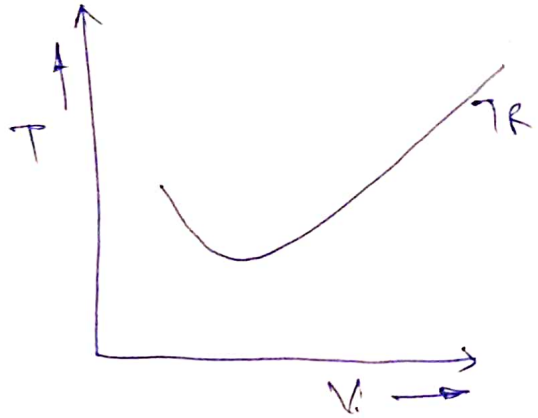
We know from Thrust Required.

$$T_R = \frac{W}{C_L/C_D}$$

Therefore thrust Required is the function of

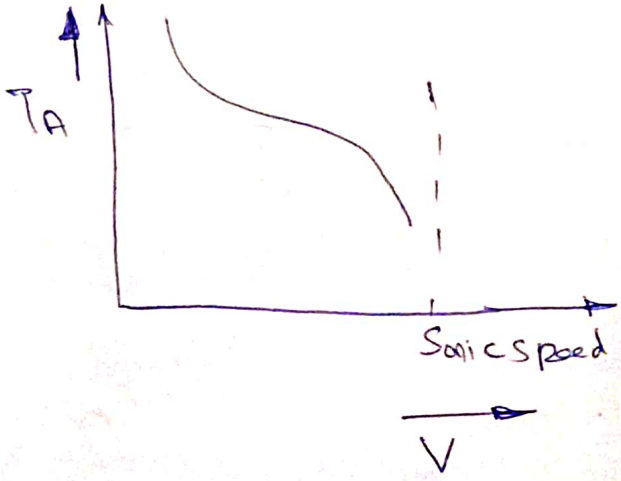
$$T_R = f(W, L, D)$$

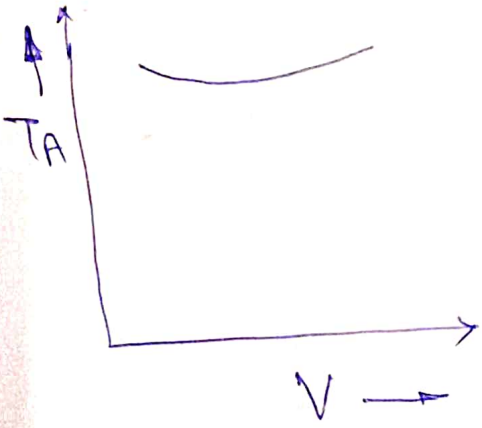
if we draw the graph for thrust Required.



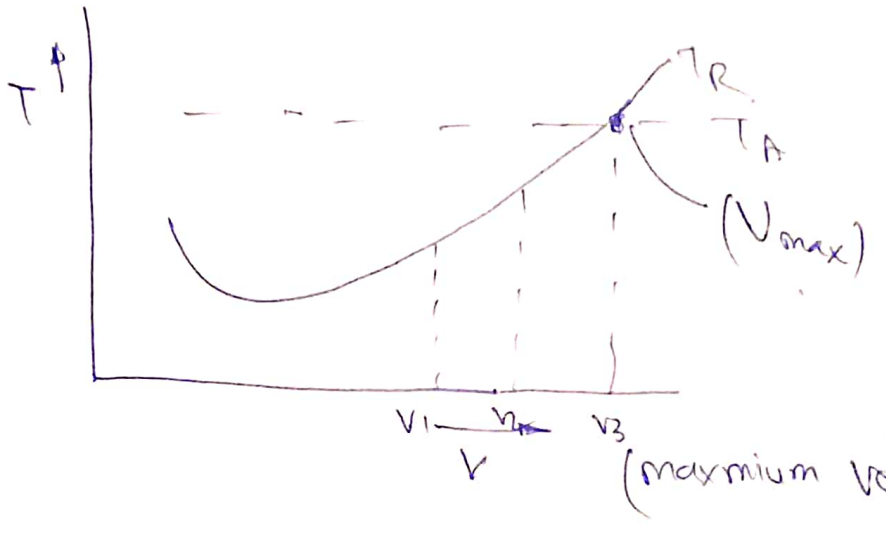
(i) propeller Engine

(ii) Jet Engine





Maximum Velocity.



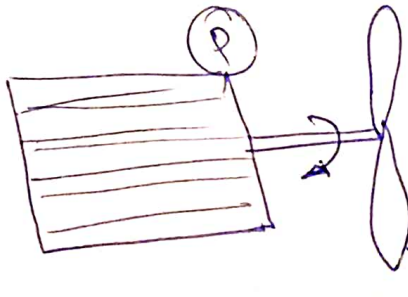
∴ Power Available:- / (Like the Thrust available)

$$P_R \propto \frac{1}{\left(\frac{C_L^{3/2}}{C_D}\right)} \rightarrow P_R = f(\omega, C_L, C_D)$$

$$P_A = f(\text{power plant}).$$

Let us take propeller Engine.

$P > P_A$.



$\therefore P_A = \eta P$

↓

Brake power (HP)

propeller efficiency

$$\boxed{P_A = \eta\, Bhp}$$

Brake horsepower.

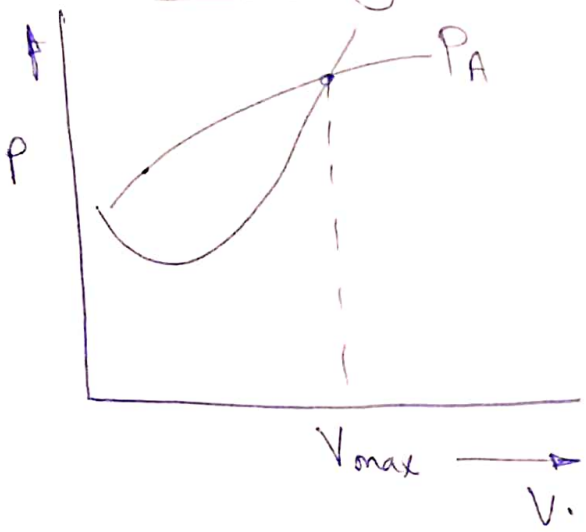
1 hp = 746 watts.

Power avable @ the shaft is called Brake horsepower.

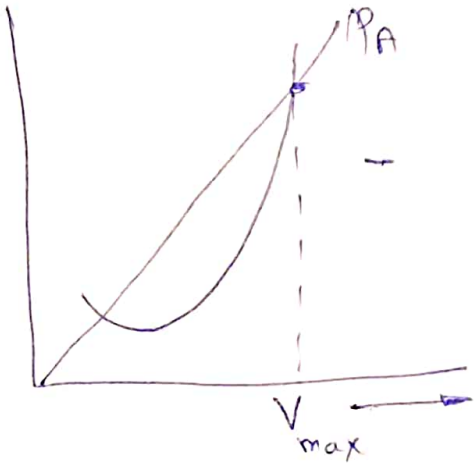
Power avable in propeller is always Less than the Brake power.

Power available Curves.

∴ Reciprocating Engine with propeller



∴ Jet Engine



$\therefore P_A = T_A \cdot V.$