Flying by numbers – information sheet

The lift formula

$$L = d \times v^2 \times s \times C_L / 2$$

Where:
- L = lift (equal to the mass of the aircraft for level flight)
- d = density of the air
- v = velocity of the aircraft
- s = wing area of the aircraft
- C_L = coefficient of lift

Change in Atmospheric density with Altitude

Altitude, meters	Air density, kg m-3
0	1.225
1000	1.112
5000	0.7365
10000	0.4136
15000	0.1948

Characteristics of selected Aircraft

Aircraft:	Maximum Take off Weight, kg	Wing area, m²	Top speed, m s-1
Airbus A380	550,000	850	280
Airbus A340	280,000	360	250
Boeing 747	400,000	510	270
Boeing 777	350,000	430	260
Concorde	190,000	360	600
Supermarine spitfire	3,000	22	162

Coefficient of Lift

Graph of C_L versus Angle of Attack, degrees