

Payload Range diagram - formulae

$$W_{TO} = W_{OE} + W_{PL} + W_F$$

Takeoff Weight = Operating Empty Weight + Payload Weight + Fuel Weight

$$W_{oe} = W_e + W_{tfo} + W_{crew} \quad h$$

$$W_e = a \cdot W_{to} + b$$



Propeller driven aircraft

$$R = \left(\frac{\eta_p}{g \cdot c_p} \right)_{\text{cruise}} \cdot \left(\frac{L}{D} \right)_{\text{cruise}} \ln \left(\frac{W_4}{W_5} \right)$$



Jet driven aircraft

$$R = \left(\frac{V}{g \cdot c_j} \right)_{\text{cruise}} \cdot \left(\frac{L}{D} \right)_{\text{cruise}} \ln \left(\frac{W_4}{W_5} \right)$$

$$1 - \frac{W_f}{W_{to}} = M_{ff}$$