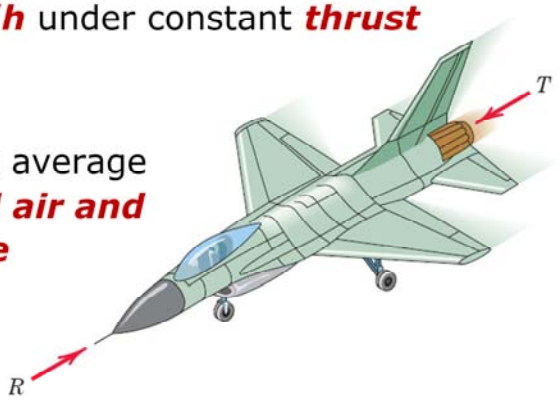
Linear Impulse-Momentum: Exercise

A jet fighter with a ***mass*** of ***6450 kg*** requires ***10 seconds*** from ***rest*** to reach its takeoff ***speed*** of ***250 km/h*** under constant ***thrust*** T ***= 48 kN***.

Determine the time average R of the ***combined air and ground resistance*** during takeoff.



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$$\int \Sigma F\,dt = m\Delta v$$

$$[48(10^3) - R]10 = 6450\left(\frac{250\times1000}{3600} - 0\right)$$

$$R = 3208 \text{ N} \quad \text{or} \quad \underline{R = 3.21 \text{ kN}}$$