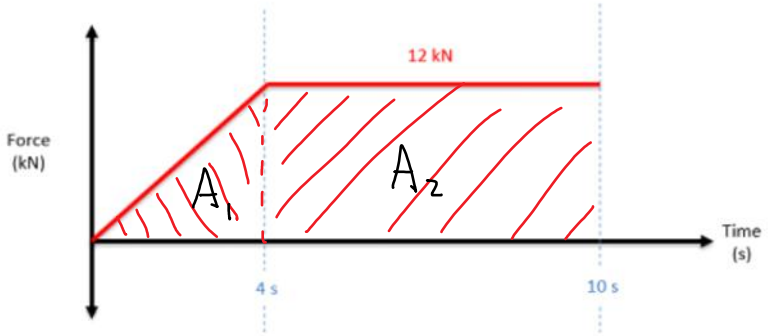
Problem 3

The plot below shows the thrust generated by the engine on a jet fighter (2500 kg) over ten seconds. If the plane is starting from rest on a runway and friction and drag are negligible, determine the speed of the plane at the end of these ten seconds.



$A_1 = \frac{1}{2}(4s)(12\,kN) = 24\,kNs$

$A_2 = (6s)(12\,kN) = 72\,kNs$

$$\int F\,dt = mV_f - \cancel{mV_i}^{\,0}$$

$$24\,kNs + 72\,kNs = (2500\,kg)\,V_f$$

$$\boxed{V_f = 38.4\,m/s}$$