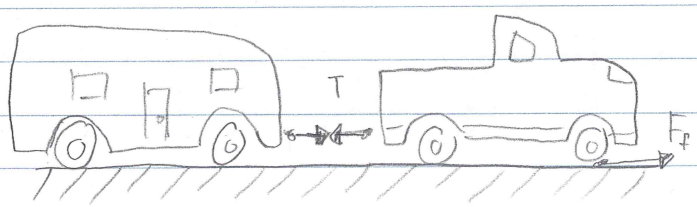
20-P-MOM-DY-27

A 2t truck starts at rest and begins to pull a 2t RV behind it with a cable. If the tires provide the force F = 10 kN, determine the velocity of the truck at time t = 7s and the tension in the cord.



Solution:

ΣF_x: $F_f = m_t a$ $\quad m_t = 2t + 2t = 4000\,kg$

$a = 2.5\ m/s^2$

$v_f = v_i + at = 17.5\ m/s$ ✓

ΣF_x: $F_f - T = m a_x$ $\quad T = F_f - m a_x = 10kN - 2000(2.5)$

of truck only $\quad T = 5000\ N$ ✓