# ROCKET

FBD


ROCKET ACCELEMATES UPWARDS W/ AN ACCELEMATION OF $3g$. WHAT IS $F_{THRUSTER}$?

$$\Sigma F = ma$$

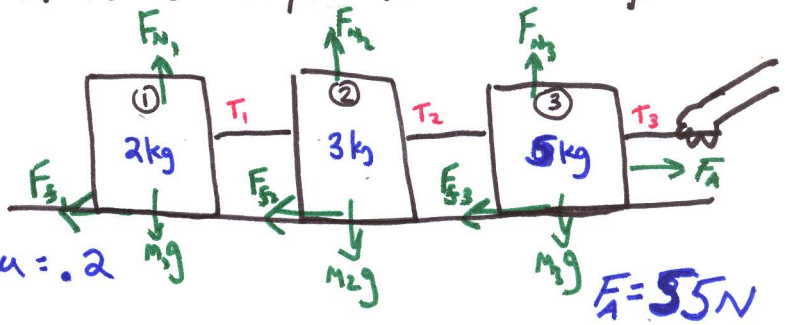
$$F_{TH} - mg = ma$$

$$F_{TH} - mg = m(3g)$$

$$F_{TH} = 4mg$$

# BOX TRAIN

↳ TREAT THEM LIKE AN ATWOOD PROBLEM, WHERE WE MUST FIND ACCELEMATION OF SYSTEM BEFORE WE FIND ANYTHING ELSE.




$\mu = .2$

$F_A = 55N$

$T_3 = 55N$

$F_f = \mu F_N$

$\Sigma F = ma$

$= \mu mg$

$$F_A - F_{f_1} - F_{f_2} - F_{f_3} = (m_1 + m_2 + m_3)a$$

$$(55N) - (.2)(2)(9.8) - (.2)(3)(9.8) - (.2)(5)(9.8) = (2+3+5)a$$

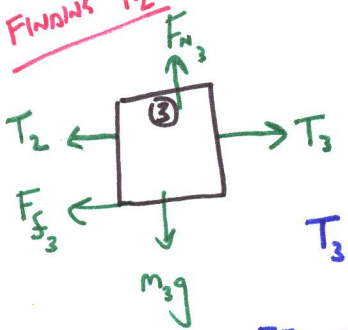
$$55 - 3.92 - 5.88 - 9.8 = (10)a$$

$$\frac{35.4}{10} = \frac{(10)a}{10}$$

$$3.54 \, m/s^2 = a$$

TO GET TENSION, LOOK AT ONE BOX ONLY

FINDING $T_2$




$\Sigma F = ma$ $F_f = \mu F_N = \mu mg$

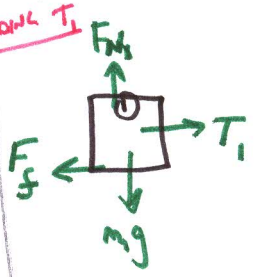
$$T_3 - T_2 - F_{f_3} = ma$$

$$55 - T_2 - (.2)(5)(9.8) = 5(3.54)$$

$$55 - T_2 - 9.8 = 17.7$$

$$T_2 = 27.5N$$

FINDING $T_1$




$\Sigma F = ma$ $F_f = \mu F_N = \mu mg$

$$T_1 - F_{f_1} = ma$$

$$T_1 - (.2)(2)(9.8) = (2)(3.54 \, m/s^2)$$

$$T_1 - 3.92 = 7.08$$

$$T_1 = 11N$$