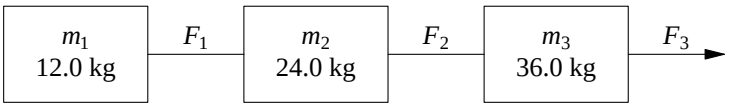
Problem 2: (20 pts.) The three blocks in the figure are pulled to the right on a horizontal frictionless table by a force of magnitude $F_3 = 96.0\,\mathrm{N}$.

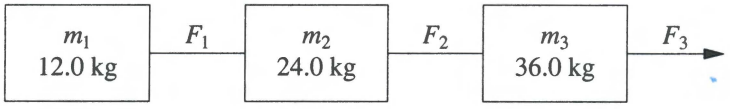


a. (6 pts.) What is the acceleration of all three blocks?

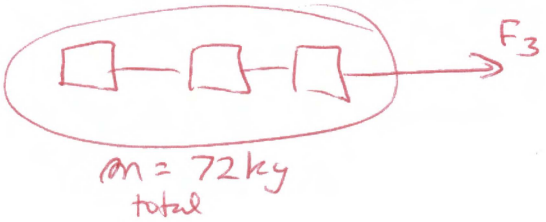
b. (7 pts.) What is the tension F_1?

c. (7 pts.) What is the tension F_2?

Problem 2: (20 pts.) The three blocks in the figure are pulled to the right on a horizontal frictionless table by a force of magnitude $F_3 = 96.0\,\text{N}$.



a. (6 pts.) What is the acceleration of all three blocks?



$F_3 = m_{\text{total}}\, a$

$a = \dfrac{96.0\,\text{N}}{72.0\,\text{kg}} = \boxed{1.33\,\text{m/s}^2}$

b. (7 pts.) What is the tension F_1?

Isolate block 1

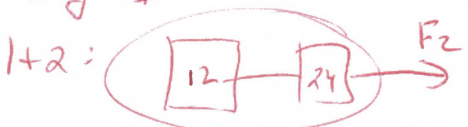
$\Sigma F = m_1 a_1$

$F_1 = (12.0\,\text{kg})\left(\frac{4}{3}\,\text{m/s}^2\right)$

$\boxed{F_1 = 16\,\text{N}}$

c. (7 pts.) What is the tension F_2?

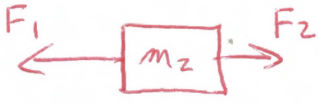
Way #1: Consider blocks



$(36\,\text{kg})\left(\frac{4}{3}\,\text{m/s}^2\right) = F_2$

$\boxed{48\,\text{N} = F_2}$

Way #2: Consider block 2



$F_2 - F_1 = m_2 a$

$F_2 - 16 = (24)\left(\frac{4}{3}\right)$

$F_2 - 16 = 32$

$\boxed{F_2 = 48\,\text{N}}$

Way #3: Consider block 3

$F_3 - F_2 = m_3 a$

$96 - F_2 = (36)\left(\frac{4}{3}\right)$

$96 - F_2 = 48$

$\boxed{F_2 = 48\,\text{N}}$