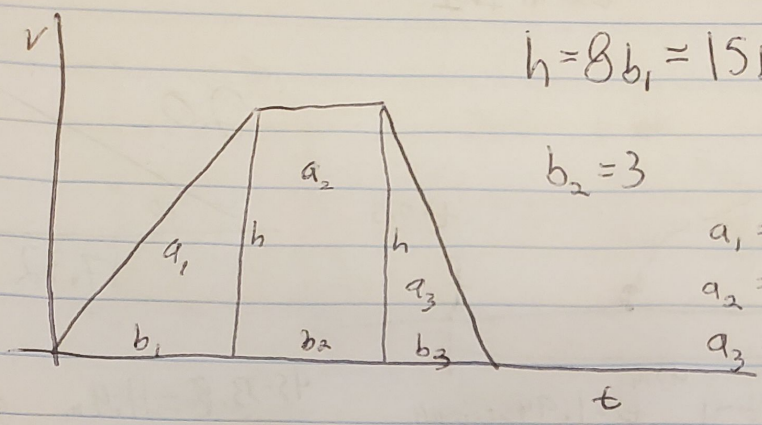
PHYS 407



$h = 8b_1 = 15b_3$

$b_3 = \frac{8}{15} b_1$

$b_2 = 3$

$a_1 = b_1 \cdot 8b_1 \cdot 0.5$

$a_2 = b_2 \cdot h$

$a_3 = b_3 \cdot 15b_3 \cdot 0.5$

$700 = a_1 + a_2 + a_3$

$700 = (b_1 \cdot 8b_1 \cdot 0.5) + (3 \cdot 8b_1) + (\frac{8}{15} b_1 \cdot 8b_1 \cdot 0.5)$

$700 = 4b_1^2 + 24b_1 + \frac{32}{15} b^2$

$0 = 4b_1^2 + \frac{32}{15} b_1^2 + 24b_1 - 700$

$0 = 92/15\ b_1^2 + 24b_1 - 700$

$b_1 = 8.904$ seconds

Sanity Check:

$700 = \frac{(8.904)(71.232)}{2} + \frac{(3)(71.232)}{2} + \frac{(4.749)(71.232)}{2}$

$700 \approx 317.125 + 213.696 + 169.140$

Correction: #5 **8.904 seconds**

Corrections: $0 = -4.9t^2 + 10t + 1 \rightarrow t = 2.14 \text{ seconds}$

#6 $17.32(2.14) = 37.07 \text{ m}$

$45 - 37.07 = 7.93 \text{ m}$

$V = 7.93 \text{ m} / (2.14 + 0.5) \text{ seconds} = \boxed{3 \text{ m/s}}$