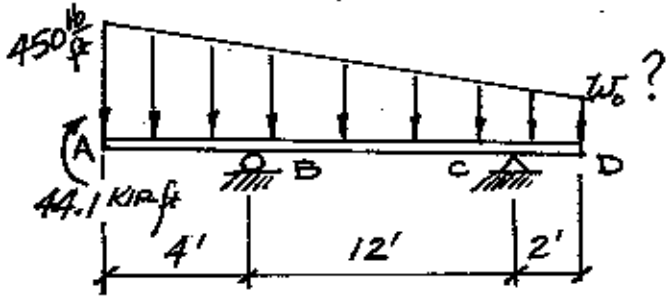
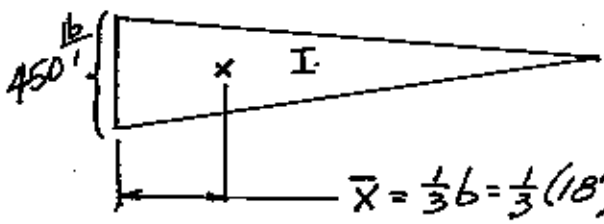
MECH 234 + 235
DISTRIBUTED LOAD

**PROB. 5-84**
p. 247

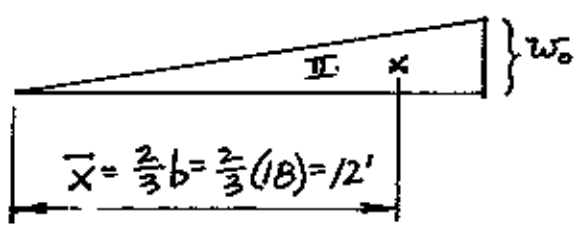
Work this problem backwards to determine $w_o$ if $R_B = 0$.



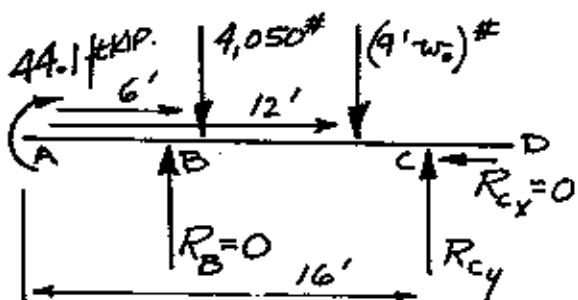

See SAMPLE PROB. 5.9, p. 242




$A_I = \frac{1}{2}bh = \frac{1}{2}(18')(450\frac{\#}{1}) = 4{,}050$ lb.
@ $x_c = 6'$




$A_{II} = \frac{1}{2}bh = \frac{1}{2}(18')w_o = (9'w_o)$ lb.
@ $x_c = 12'$




$\Sigma F_x = 0 = R_{cx}$ ✓

$\Sigma F_y = 0 = -4{,}050 - 9'w_o + R_{cy}$ (+)

Take moments about C to eliminate unknown $R_{cy}$ and solve for $w_o$

$\Sigma \overset{\curvearrowleft}{M_c} = 0 = -44{,}100$ ft.lb. $+ (4{,}050\#)(10') + (9'w_o)(4')$

$44{,}100 - 40{,}500 = (9'w_o)(4')$

$\frac{3600 \text{ ft.lb.}}{(9')(4')} = \boxed{w_o = 100 \frac{\text{lb.}}{'}}$

$\therefore \Sigma F_y = 0$ $\quad 4{,}050$ lb. $+ 9'(100 \frac{\text{lb.}}{'}) = \boxed{R_{cy} = 4{,}950 \text{ lb.} \uparrow}$