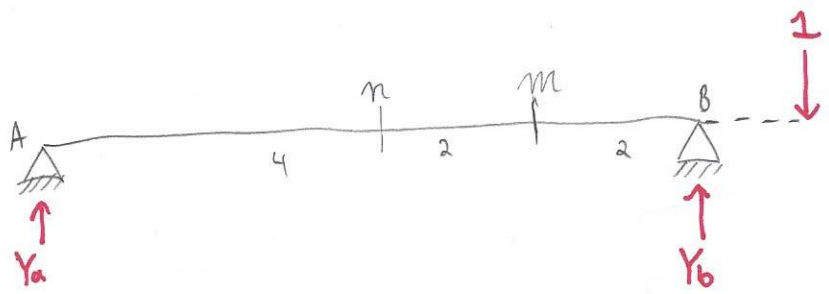
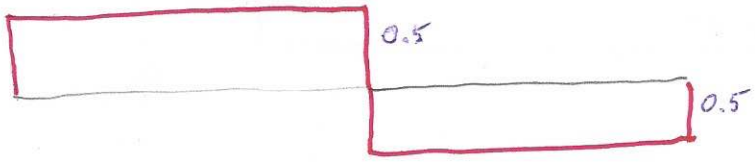
Benjamin Klassen
Sept 30 2020

①




n

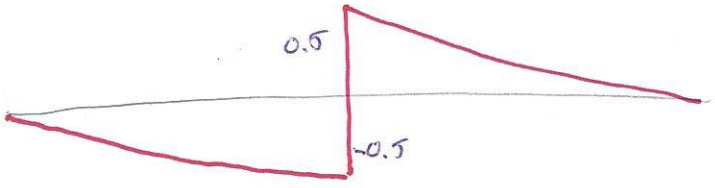
If load applied @ n.




@ 2, $\sum F_y = 0$, $Y_a(0.75) - 1 - Q_n = 0$ , @ zeros, $Q_n = 0$

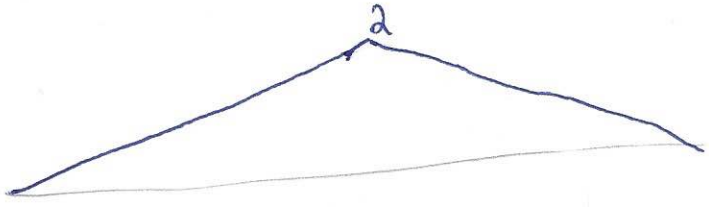
$Q_n = -0.25$

$Q_n$



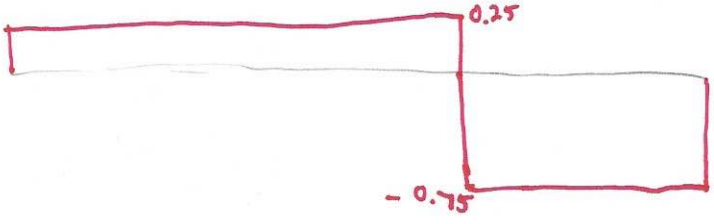

@ n, $\sum M = 0$, $0.5(4) = M$, $M = 2$

$M_n$

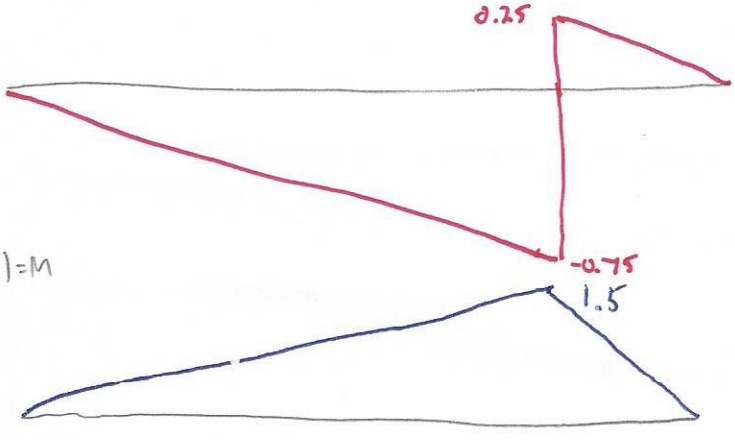



m

If load apted @ m,

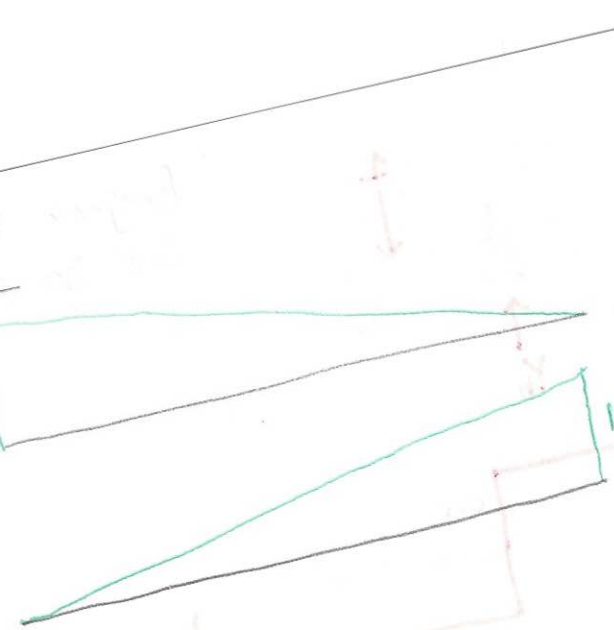



$\therefore Q_m$

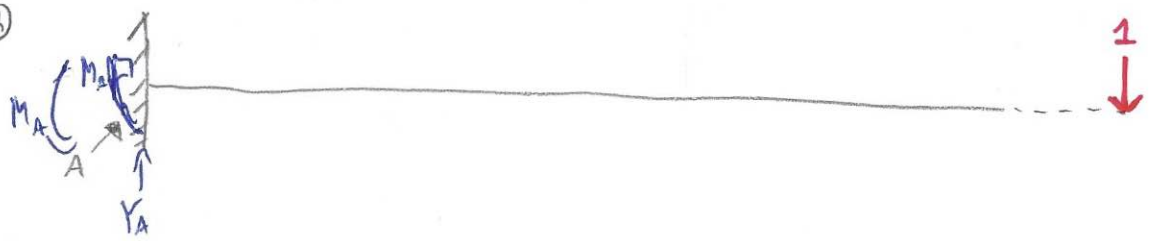



@ (2), $\sum M = 0$, $0.75(2) = M$

$= 1.5$



②




SF

$Q_n$ =

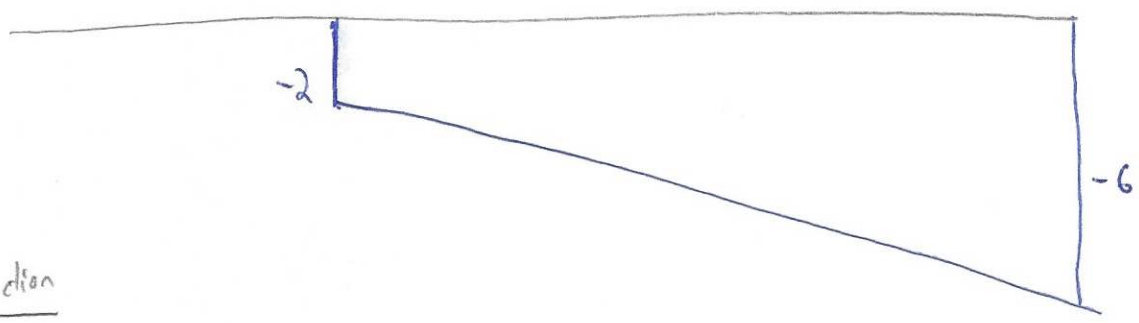
$M_n = -6$

@ 6, $M_A = 6$ ↺, @ 2, $M_A = 2$ ↻, $M_n = -2$

$0 \le x < 2$, ~~$\Sigma M = 0$, $1(x) = M_A$, $\therefore M_n = 0$~~ @ 1, $\Sigma M_n = 0$, $M_A + 1(1) + M_n$, $M_n = 0$

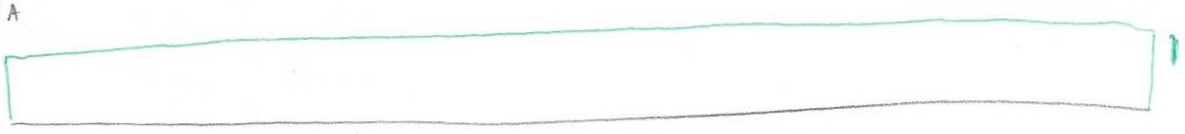
$-1$

$M_n$

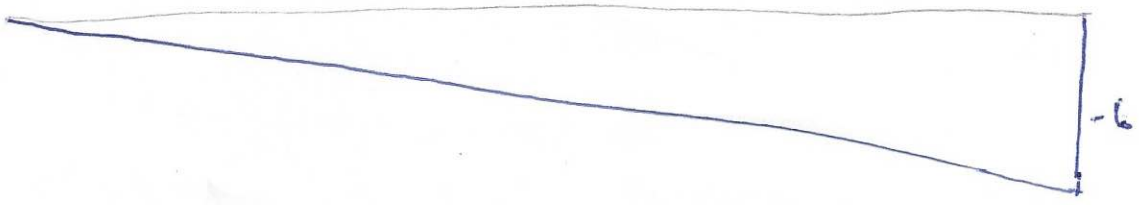



Reaction

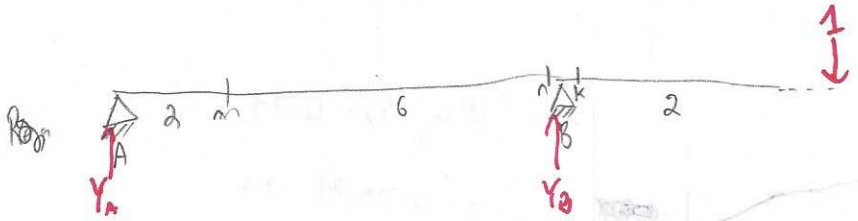
$Y_A$



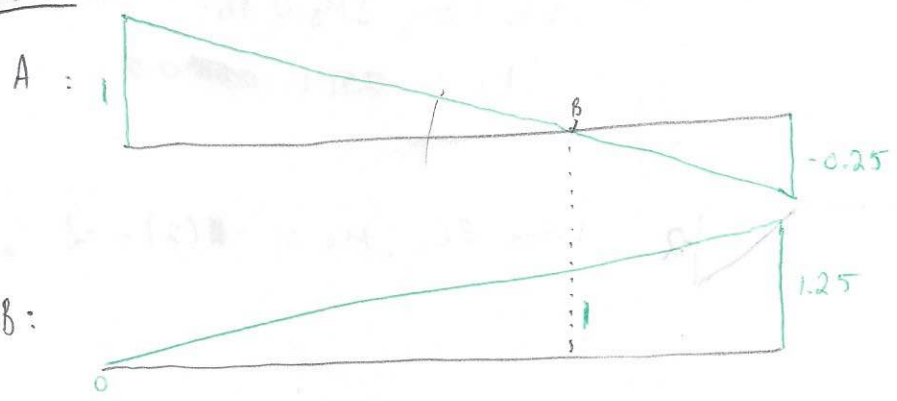

M @ A



③

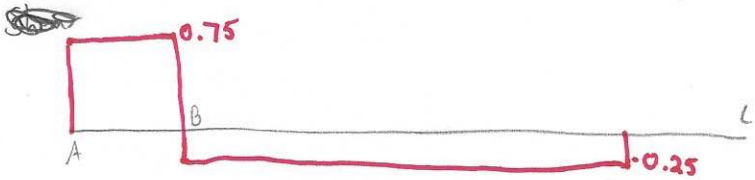



Readings




Shear

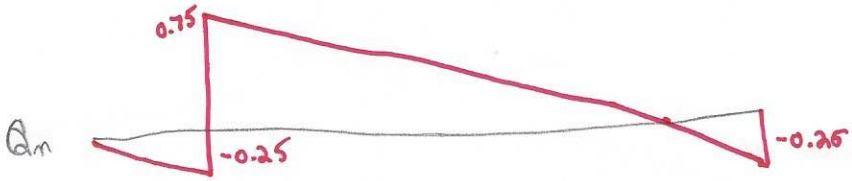
m




when 1 applied @ C, $\sum M_A = 0$, $1(10) - Y_B(8)$

$Y_B = 1.25$

$\sum F_y = 0$, $1.25 - 1 + Y_m$, $Y_m = -0.25$



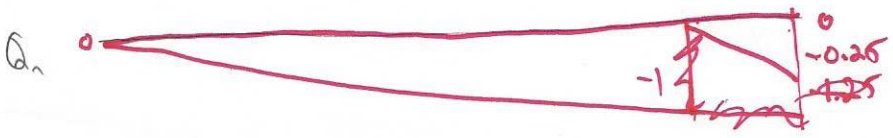

n

when 1 applied @ n, $\sum F_y = 0$, $n_y = -1$

when 1 applied @ C, $\sum M_A = 0$, $Y_B = 1.25$

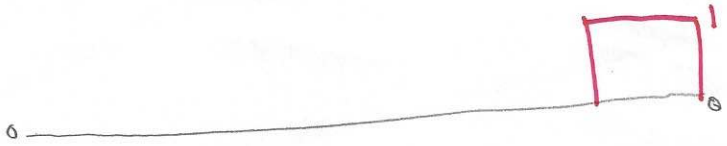
$\sum F_y = 0$, $n_Y + Y_b - 1$

$n_Y = -0.25$



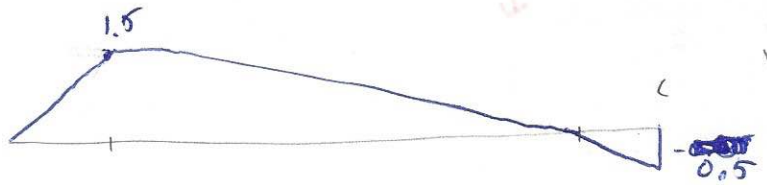

k

when 1 applied @ C, $k_y = 1 \uparrow$



Moment

m:




when I @ $m$, $V_A = 0.75$

$\therefore m = 0.75(2) = 1.5$

when I @ C, $\Sigma M_B = 0$, $V_B = -0.25$ [↑]

$\therefore M_m = -0.25(2) = -0.5$

n:

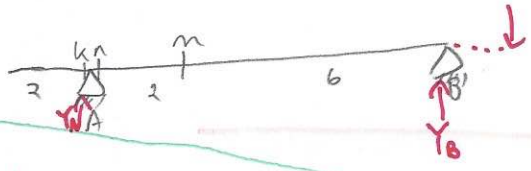
when I @ C, $\Sigma M_k = 0$, $-1(2) = -2$

when I @ C, $\Sigma M_n = 0$, $-1(2) = -2$

k:

(4)

Reactions



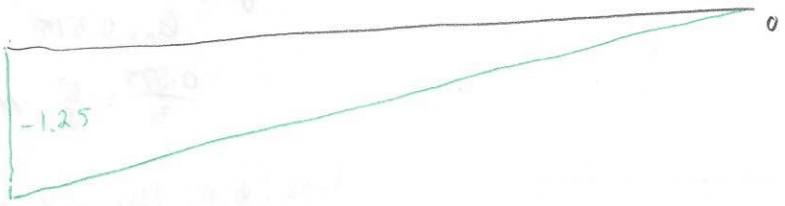

A:

when 1 @ 0,

$\Sigma M_B = 0$, $-1(8) + Y_A(8)$

$Y_A = 1.25$

B:




k

Shear



$Q_k$

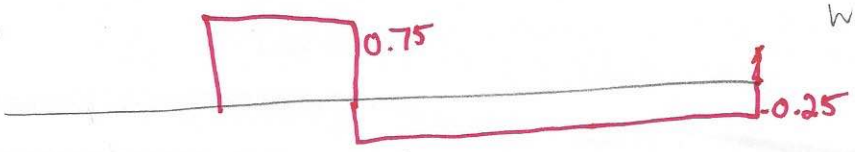
$M_k$

when 1 @ 0, $M_k = -1(2)$

$= -2$

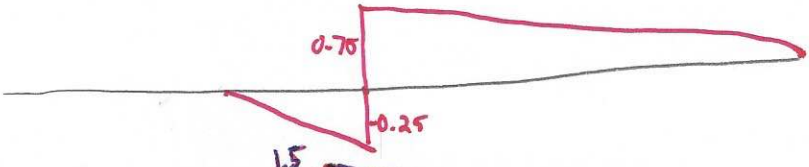
m

Shear

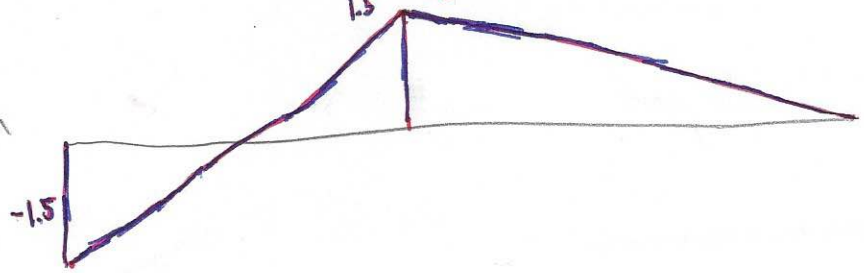



when 1 @ m,

$Q_m$




$M_m$




when 1 @ m, $Y_B = 0.25$

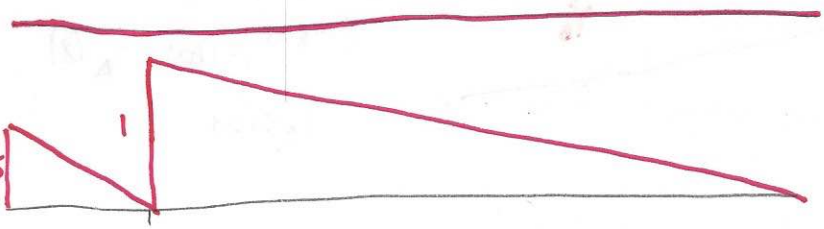
$\therefore M_m = 0.25(6) = 1.5$

when 1 @ 0, $Y_B = 0.25$ [↓]

$M_m = -0.25(6) = -1.5$

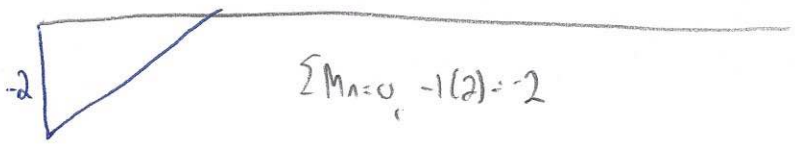
A

Shear $Q_n$




$Q_n$

$M_n$




$\sum M_n = 0, \; -1(2) = -2$

when 1 @ 3 [from right], $Y_B = 0.625$

$\sum F_y = 0, \; 0.625 - 1 + Q_n$

$Q_n = 0.375$

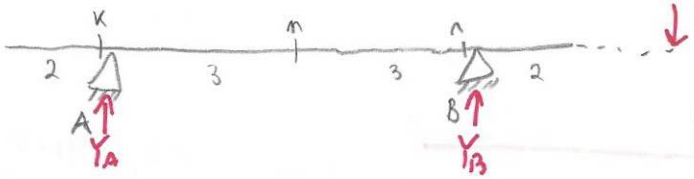
$\frac{0.375}{3} = \frac{x}{8}, \; x = 1.666$

when 1 @ 0, $\sum M_A = 0, \; Y_B = 0.25$

$\therefore n_r = 0.25$

(5)

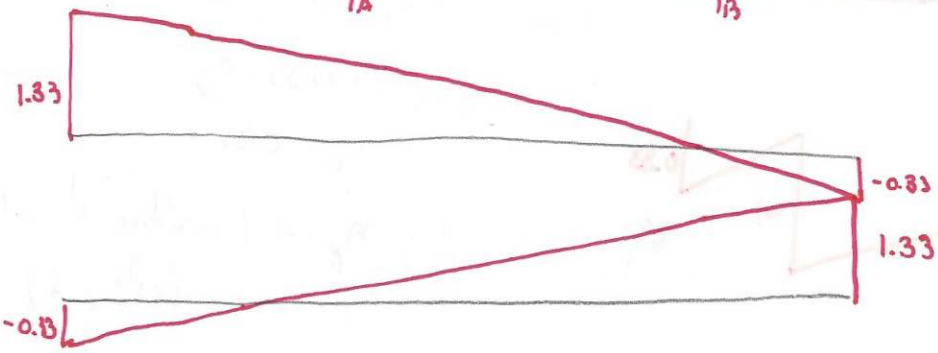
Reactions




Since @ 6 from B (at A), $Y_A = 1$

$\frac{1}{6} = \frac{x}{8}$, $x = 1.33$

A:




B:




Shear

Shear



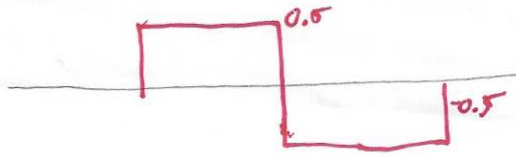
$Q_K$

$M_K$

$-1(2) = -2$

m

Shear



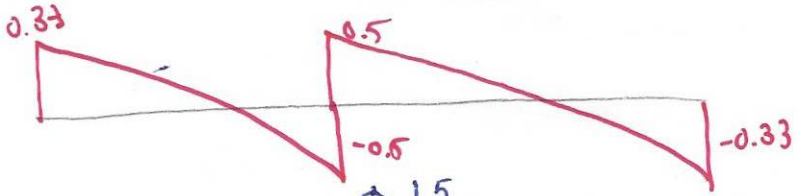

when 1 @ 0, $\Sigma M_B = 0$, $1(8) - Y_A(6)$

$Y_A = 1.33$

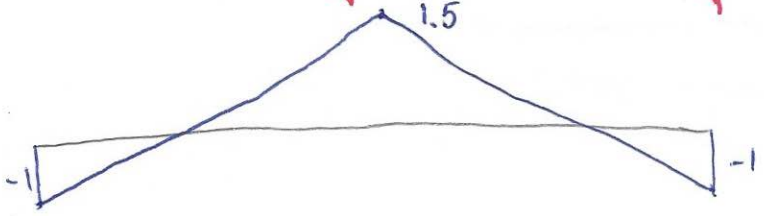
$\Sigma F_y = 0$, $-1 + 1.33 = m_y$

$m_y = 0.33$

$Q_m$




$M_m$



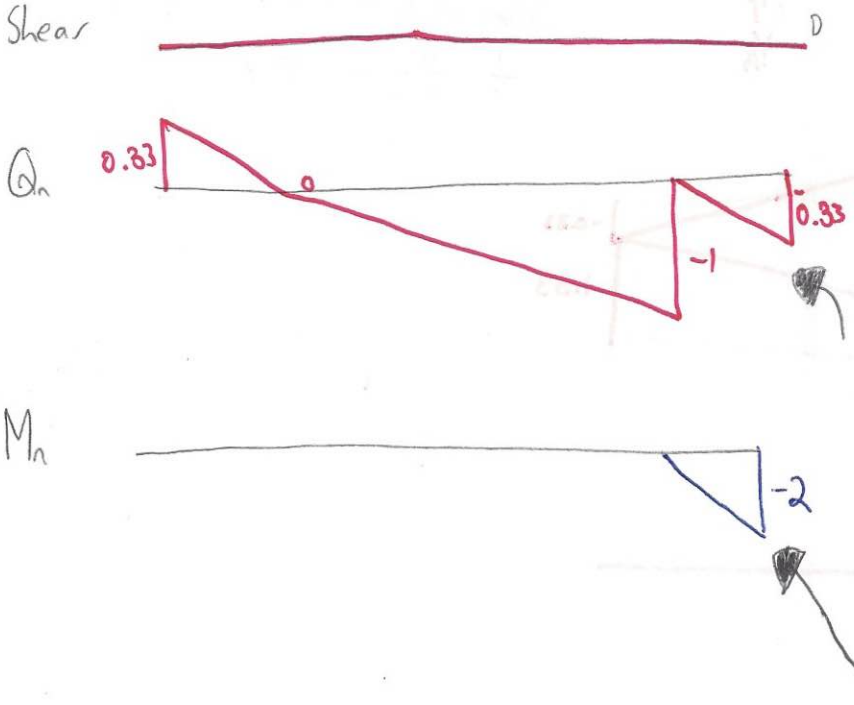

when @ m, $Y_A = 0.5$.

$\therefore M_m = 0.5 \cdot 3 = 1.5$

when 1 @ 0, $Y_B = -0.33$

$\therefore \Sigma M = 0$, $M_m = -1$

n




When 1 @ D, $\Sigma M_A = 0$, $Y_B = 1.33 \uparrow$

$\Sigma F_y = 0$, $-1 + 1.33 + n_y$

$n_b = -0.33$

When 1 @ n, $V_y = -1$ (positive ↓ w/ left cut)

When 1 @ 0, $Y_A = 1.33 \uparrow$

$\Sigma F_y$: $1.33 - 1 - n_y$

$n_y = 0.33$