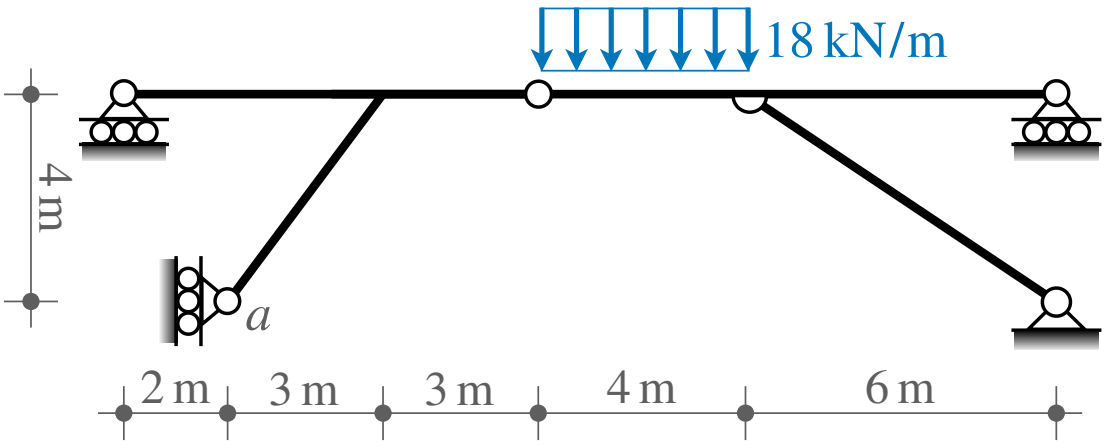
FONDAMENTI DI MECCANICA DELLE STRUTTURE

(docente: G. FORMICA)

PROVA di VERIFICA – 24 novembre 2023

STUDENTE: TRACCIA **D**



Parte 1

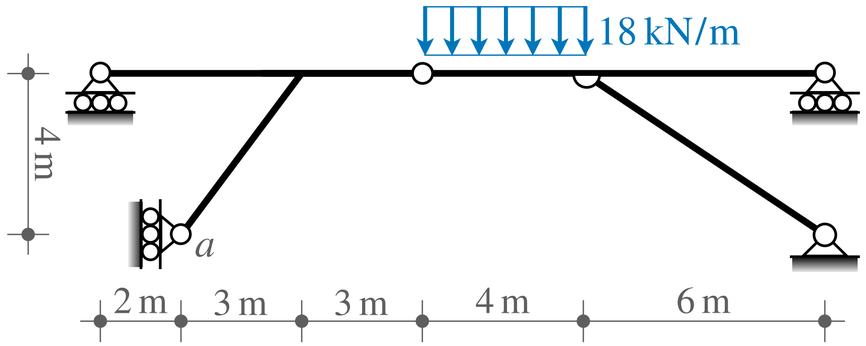
Del sistema isostatico rappresentato in figura, si chiede di:

1.1. determinare il valore delle reazioni vincolari con il metodo dei corpi liberi;

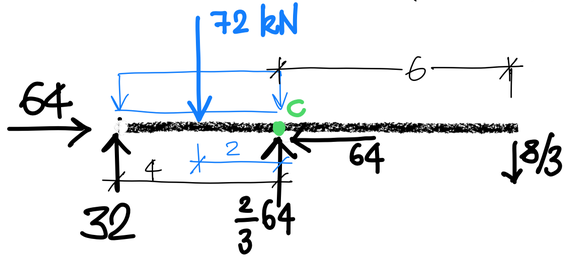
1.2. verificare con il metodo della potenza la reazione al vincolo di traslazione orizzontale del carrello posto in a;

1.3. tracciare i grafici delle caratteristiche della sollecitazione (N, T, M).

D

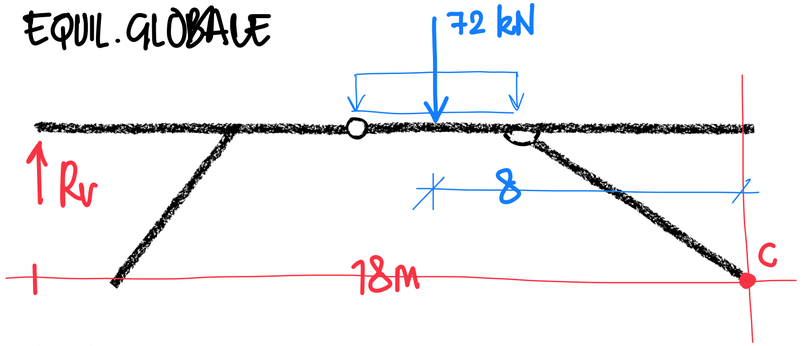


EQUIL. LOCALE (VERIFICA)

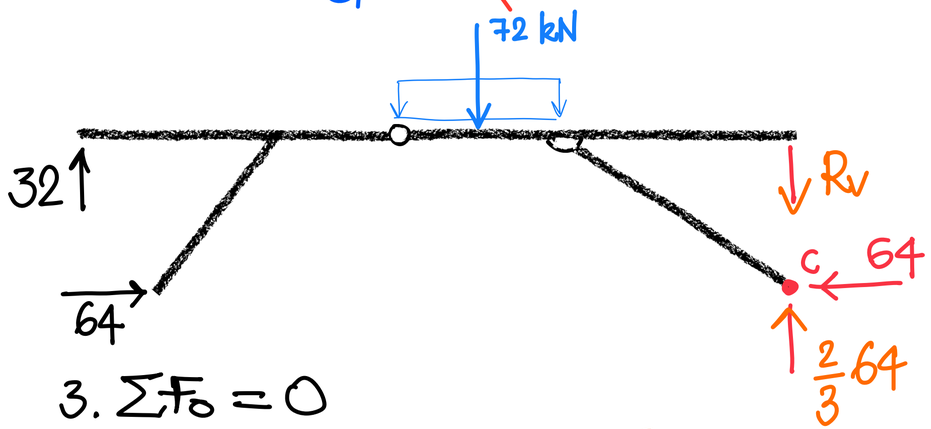


6. $\sum_C M = 72\times 2 - 32\times 4 - 8/3\times 6 = 0$ (G, T, ↻)

EQUIL. GLOBALE



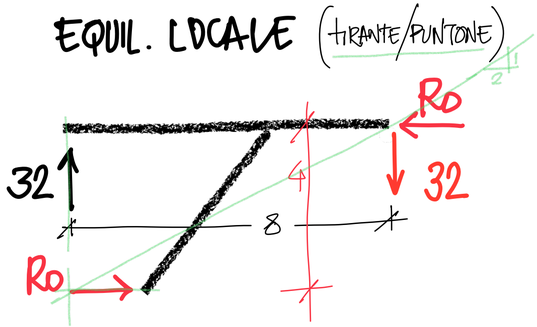
1. $\sum_C M = 72\times 8 - R_V\times 18 = 0 \Rightarrow R_V = 32$ (G, ↻)



3. $\sum F_O = 0$

5. $\sum F_V = 0 = 72 - 32 - \frac{2}{3}64 + R_V = 0 \rightarrow R_V = 8/3$

EQUIL. LOCALE (TIRANTE/PUNTONE)



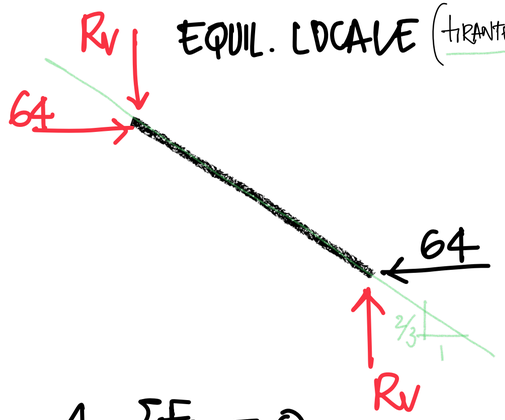
2. $\sum F_O = 0$

$\sum F_V = 0$

$\sum M = 32\times 8 - R_O\times 4 = 0$ (R, G)

$\Rightarrow R_O = 64$

EQUIL. LOCALE (TIRANTE/PUNTONE)



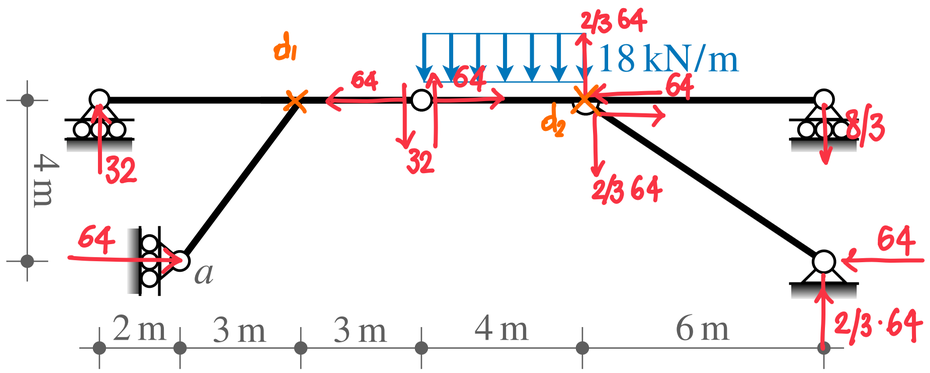
4. $\sum F_O = 0$

$\sum F_V = 0$

$\sum M = 64\times 4 - R_V\times 6 = 0$ (T, G)

$\Rightarrow R_V = \frac{2}{3}64 \cong 42.67$

risultato delle REAZIONI VINCOLARI e punti di discontinuità per N,T,M



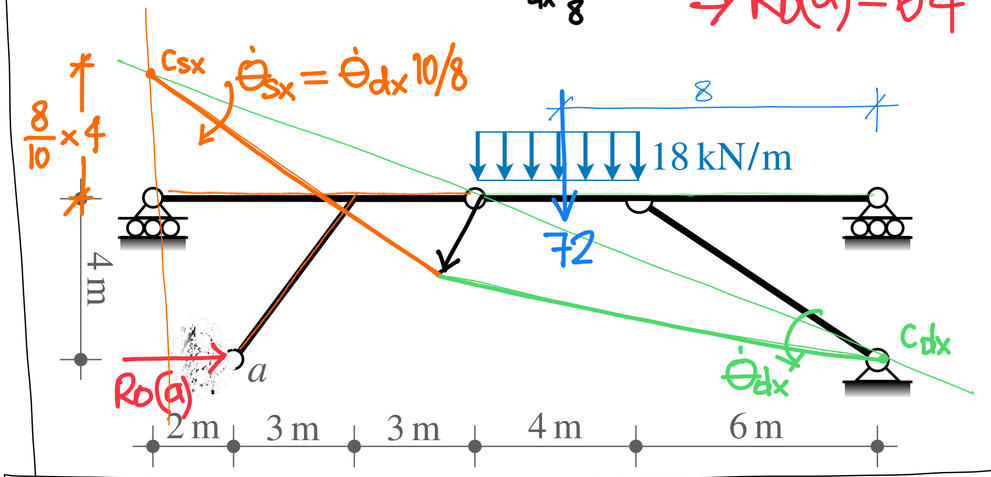
VERIFICA con metodo della POTENZA

$$\mathcal{P} = -R_0(a) \times \left(4 + \frac{8}{10} \times 4\right) \dot{\Theta}_{sx} + 72 \times 8 \, \dot{\Theta}_{dx} = 0$$

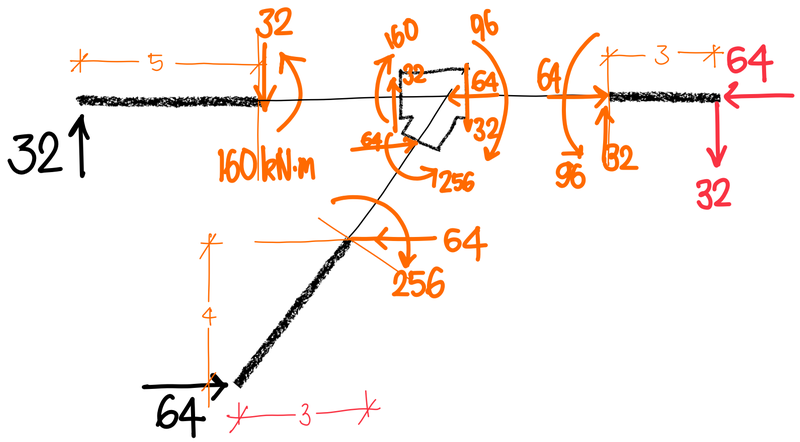
$R_0(a)$: G; $\dot{\Theta}_{sx}$: G; 72×8: G; $\dot{\Theta}_{dx}$: G

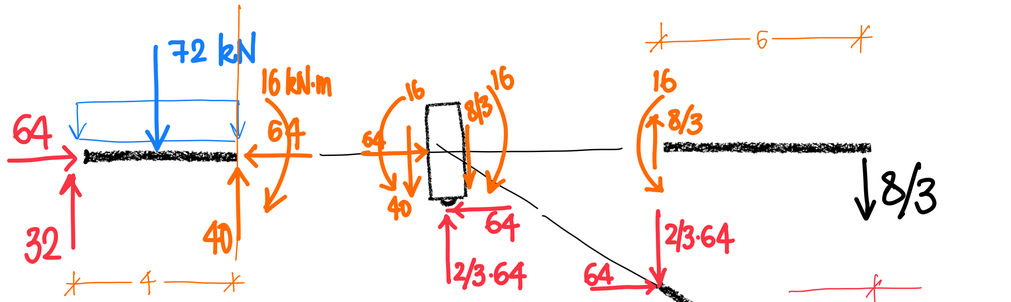
$\dot{\Theta}_{dx} \frac{10}{8}$

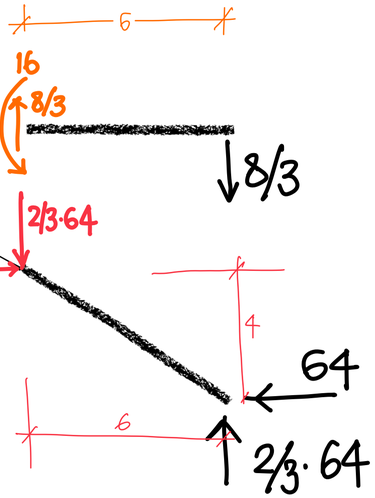
$$\Rightarrow R_0(a) = 64$$

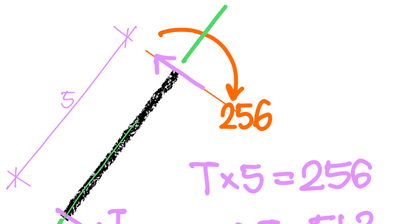


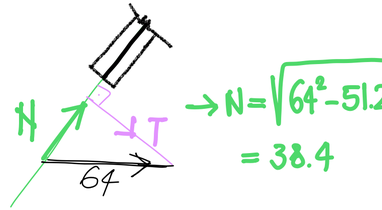
Equilibri locali su tratti con N,T,M funzioni continue



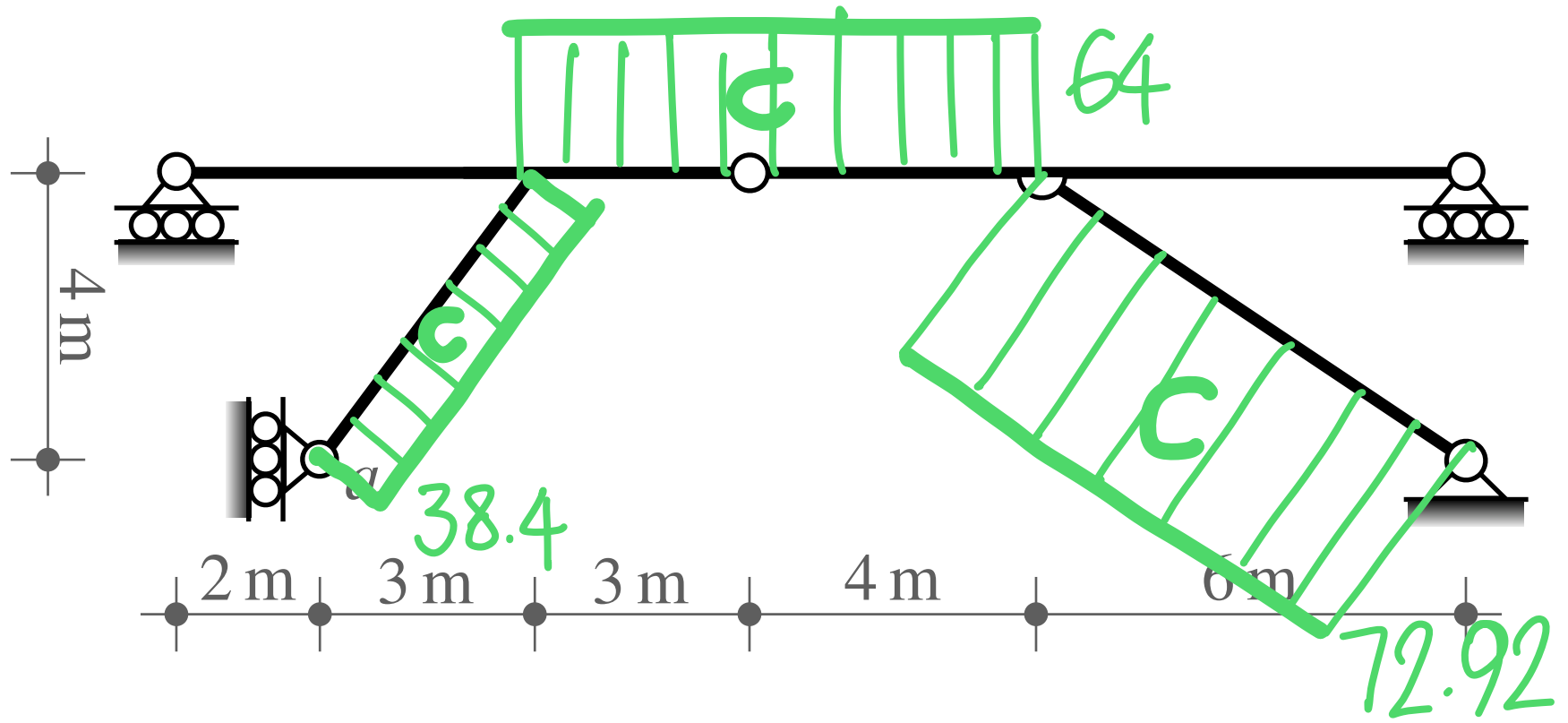




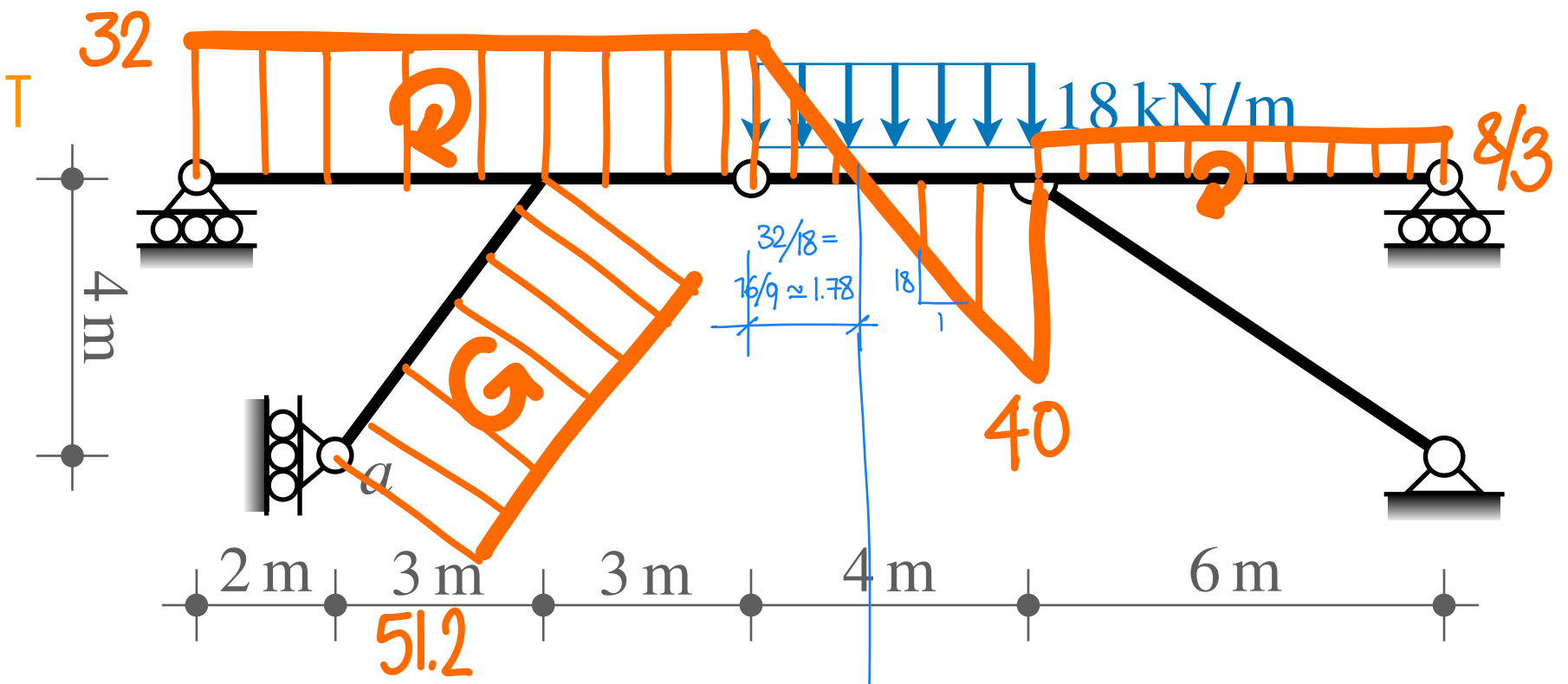




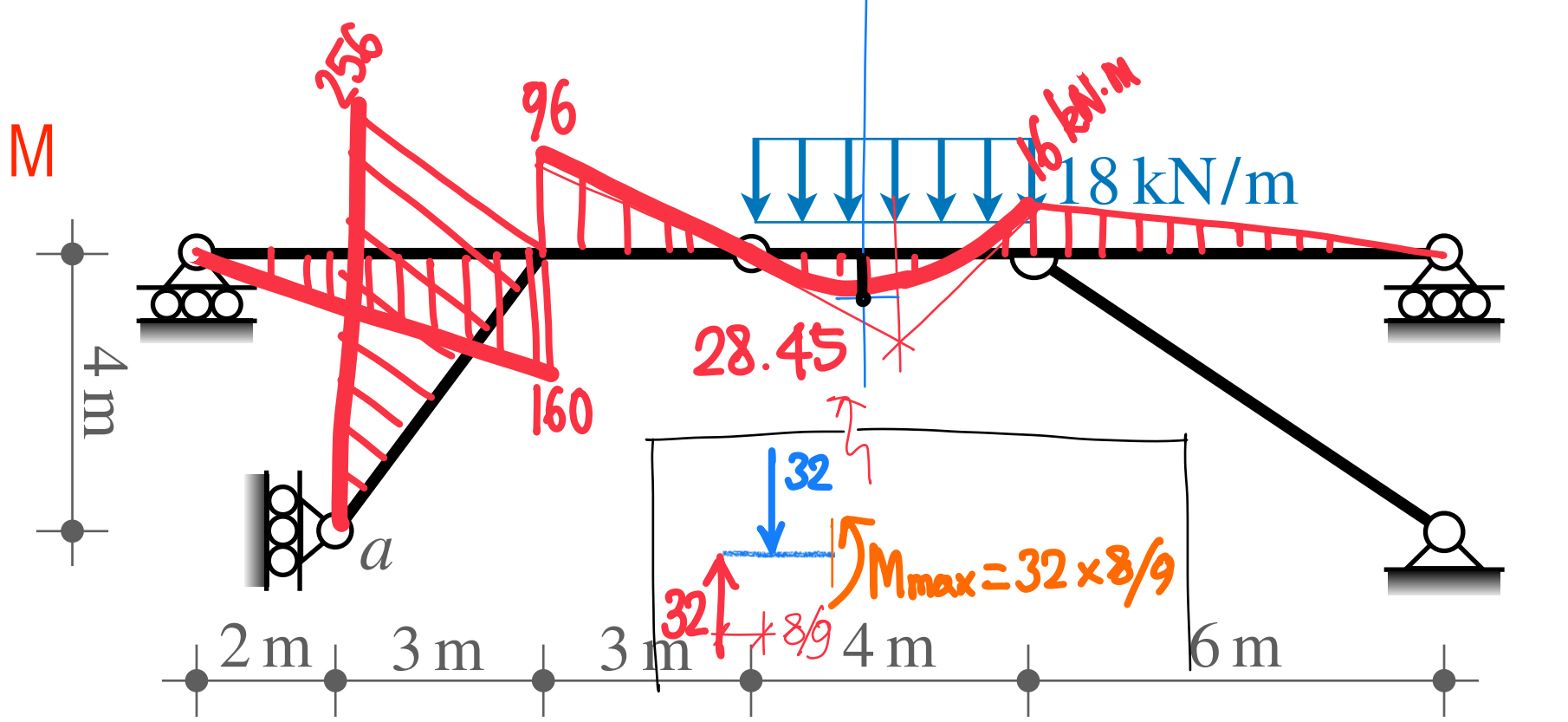
N


64
38.4
72.92
4 m
2 m
3 m
3 m
4 m
6 m
a

T


32
18 kN/m
8/3
32/18 =
16/9 ≈ 1.78
18
1
40
51.2
4 m
2 m
3 m
3 m
4 m
6 m
a

M


256
96
16 kN.m
18 kN/m
28.45
160
32
32
8/9
Mmax = 32 × 8/9
4 m
2 m
3 m
3 m
4 m
6 m
a