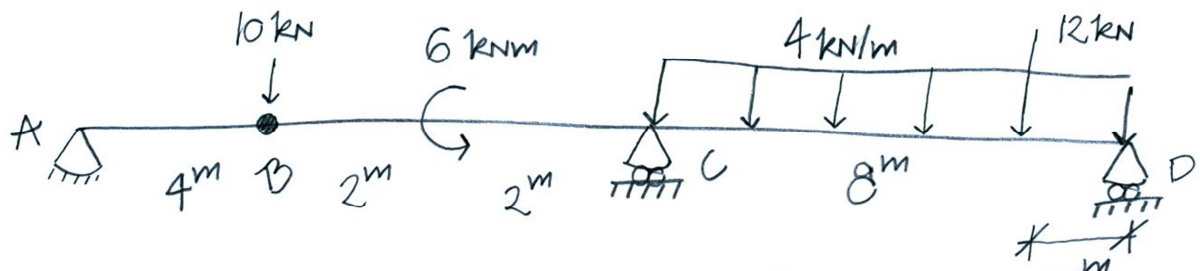



Draw axial, shear, bending moment diagrams for the system shown above

## Equilibrium Equations

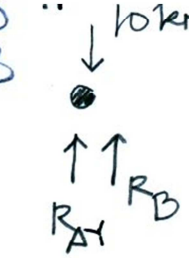
For part AB:

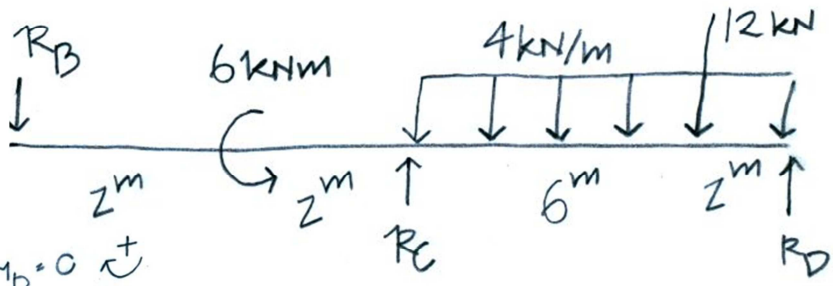
$\Sigma F_x = 0 \Rightarrow R_{AX} = 0$

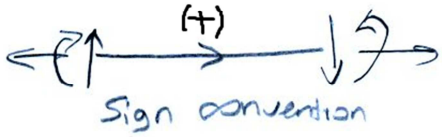
$\Sigma M_B = 0 \Rightarrow R_{AY} = 0$

$\therefore$ 10 kN

$R_B = 10$ kN

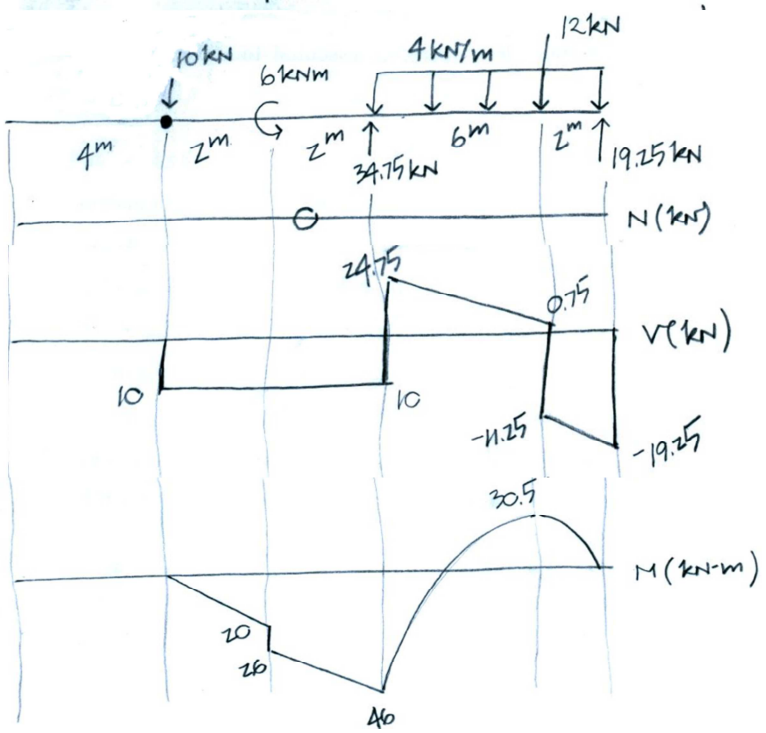

$\Sigma M_D = 0$ (+ ↺)

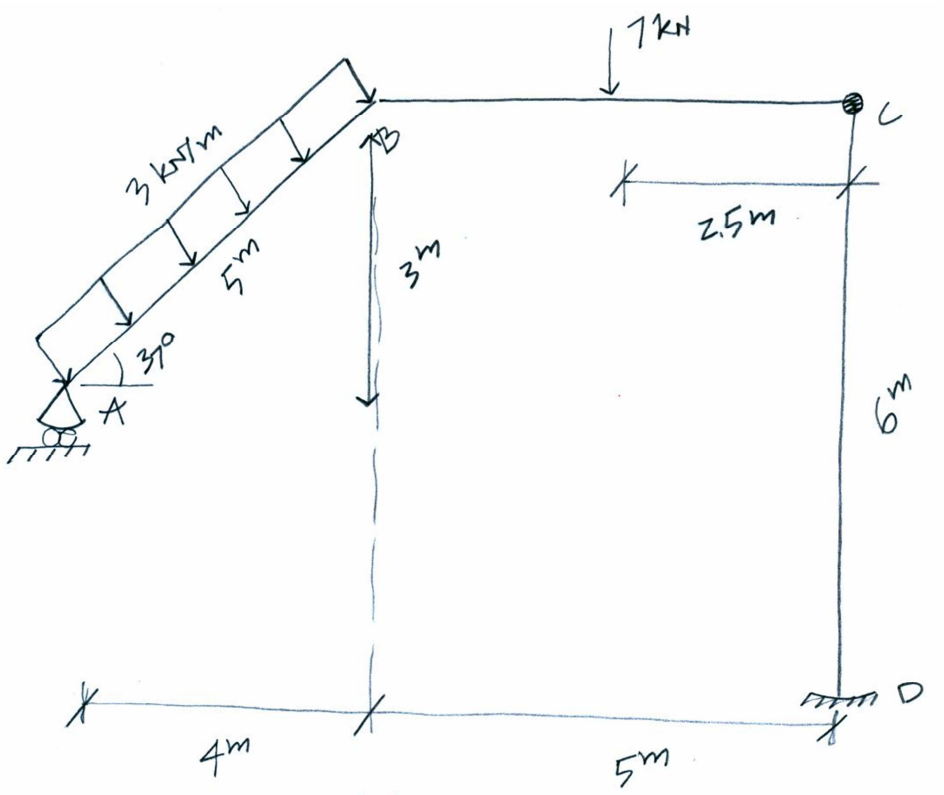
$-R_B \times 12 - 6 + R_C \times 8 - (4 \times 8) \times 4 - 12 \times 2 = 0$

$8R_C = 278$ $\quad \boxed{R_C = 34.75 \text{ kN}}$

$-R_B + R_C - 4 \times 8 - 12 + R_D = 0 \quad (\Sigma F_y = 0)$

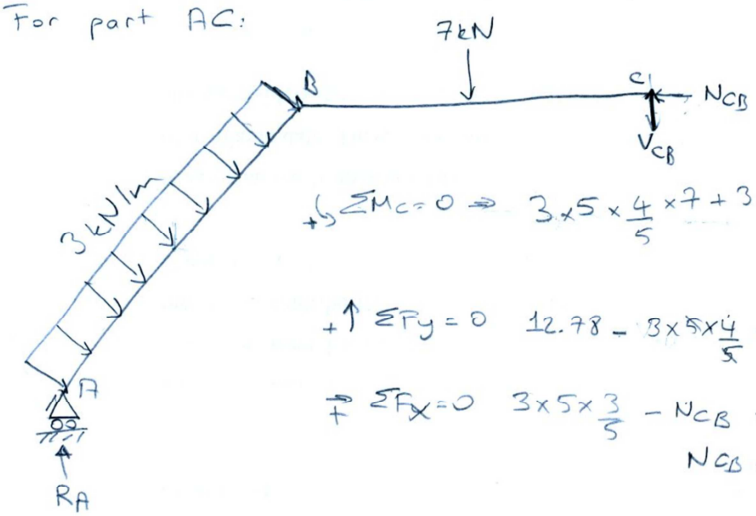
$\boxed{R_D = 19.25 \text{ kN}}$






Draw axial, shear, bending moment diagrams for the system

For part AC:




$\circlearrowleft \Sigma M_C = 0 \Rightarrow 3\times5\times\frac{4}{5}\times7 + 3\times5\times\frac{3}{5}\times3.5 + 7\times2.5 - R_A\times9 = 0$

$R_A = 12.78\ kN (\uparrow)$

$+\uparrow \Sigma F_y = 0 \quad 12.78 - 3\times5\times\frac{4}{5} - 7 + V_{CB} = 0$

$V_{CB} = 6.22\ kN (\uparrow)$

$\rightarrow \Sigma F_x = 0 \quad 3\times5\times\frac{3}{5} - N_{CB} = 0$

$N_{CB} = 9\ kN (\leftarrow)$

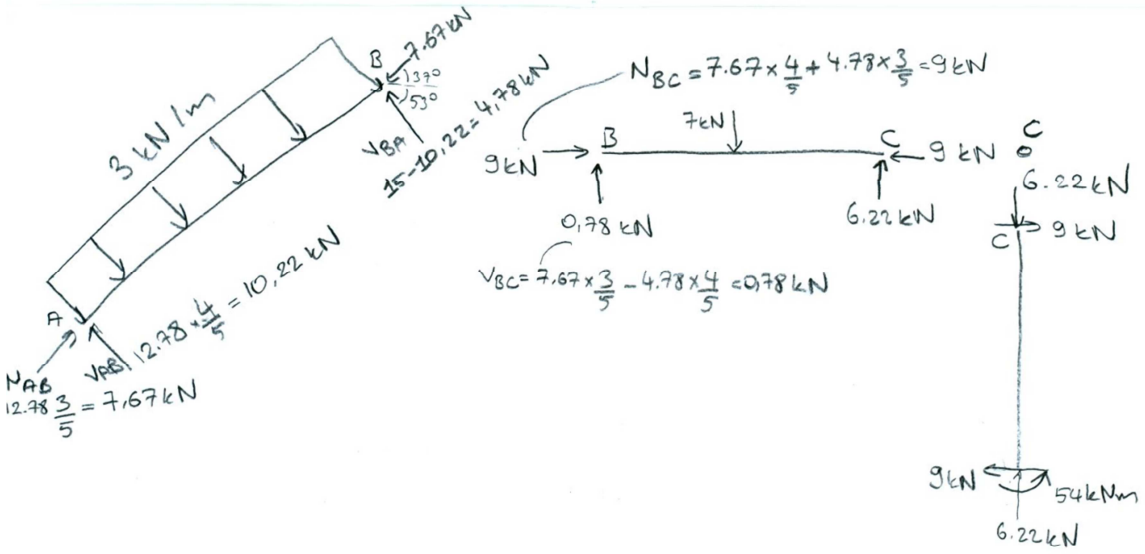
For part CD:

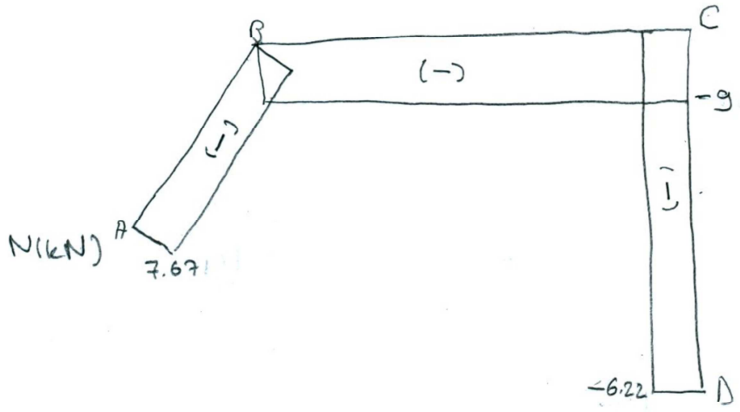

$\Sigma F_x = 0 \Rightarrow R_{DX} = 9\ kN (\rightarrow)$

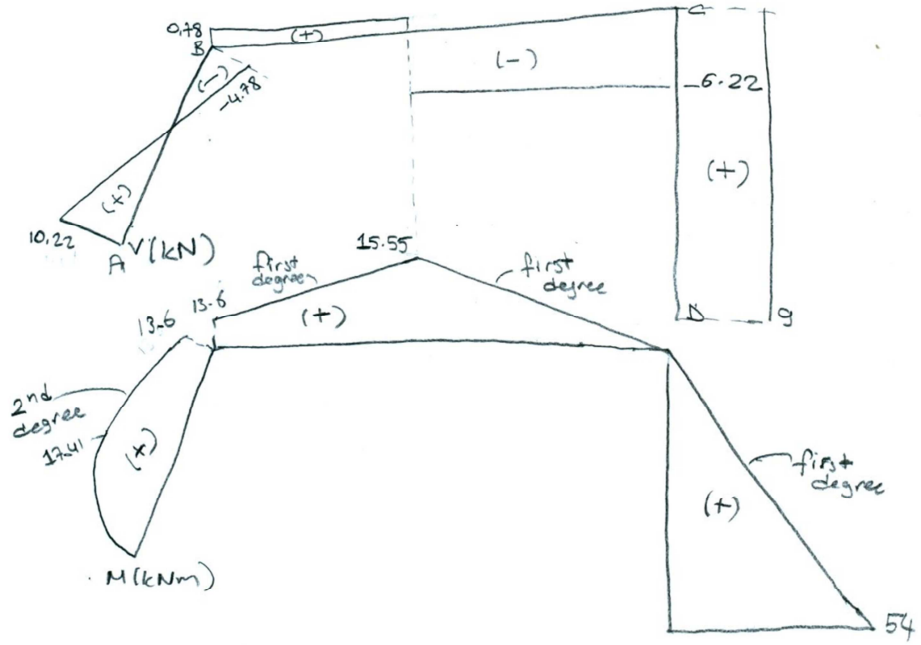
$\Sigma F_y = 0 \Rightarrow R_{DY} = 6.22\ kN (\uparrow)$

$\circlearrowleft \Sigma M_D = 0 \quad M_D - 9\times6 = 0$

$M_D = 54\ kNm (\curvearrowleft)$


3 kN/m
A
B
7.67 kN
VBA
15-10,22 = 4,78 kN
VAB
12.78 · 4/5 = 10,22 kN
NAB
12.78 3/5 = 7,67 kN
NBC = 7.67 × 4/5 + 4.78 × 3/5 = 9 kN
7kN
9kN
0,78 kN
6.22 kN
VBC = 7.67 × 3/5 − 4.78 × 4/5 = 0,78 kN
6.22 kN
9 kN
9kN
54kNm
6.22kN


N(kN)
A
B
C
D
(−)
(−)
−9
7.67
−6.22


V(kN)
0,78
(+)
(−)
−4.78
(+)
10,22
A
B
(−)
−6.22
(+)
9
D
15.55
first degree
first degree
13.6
13.6
(+)
2nd degree
12.41
(+)
M(kNm)
(+)
first degree
54