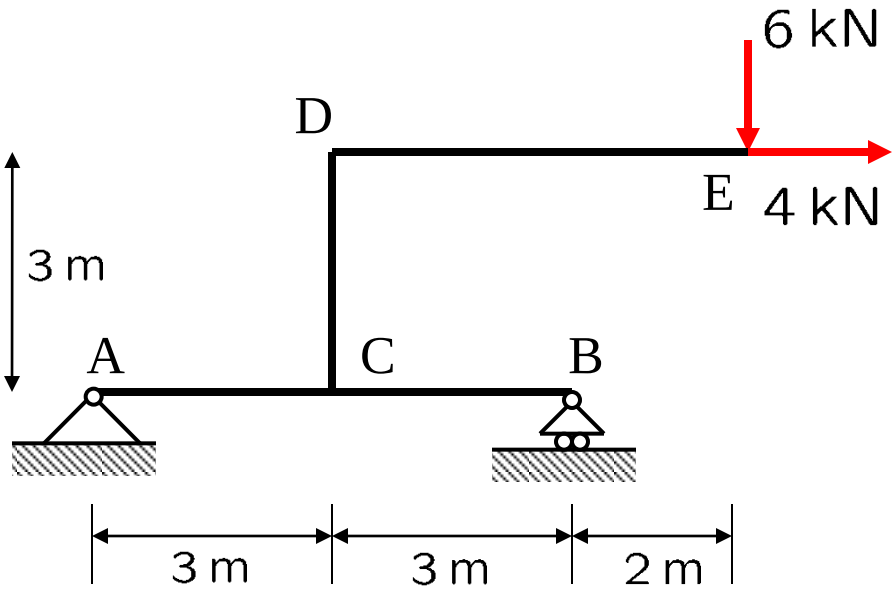
Today:

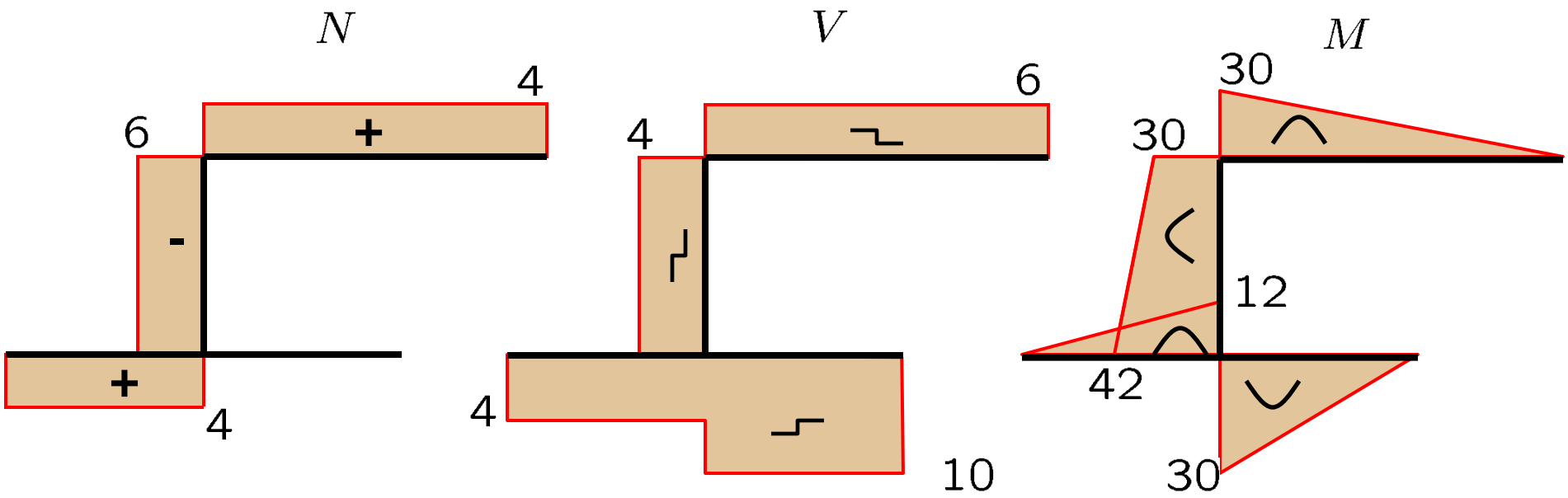
Internal effects in beams continued

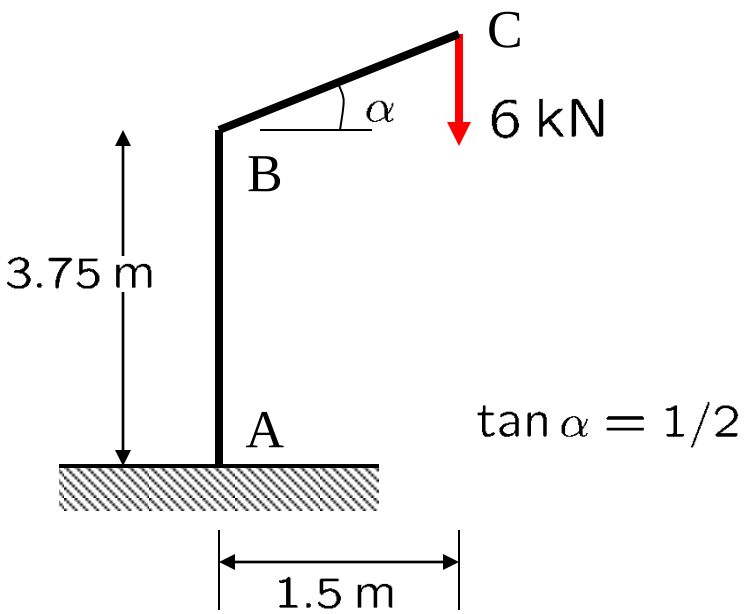
Frames

Book: Chapter 6.6, 7.1-7.3 + hand outs

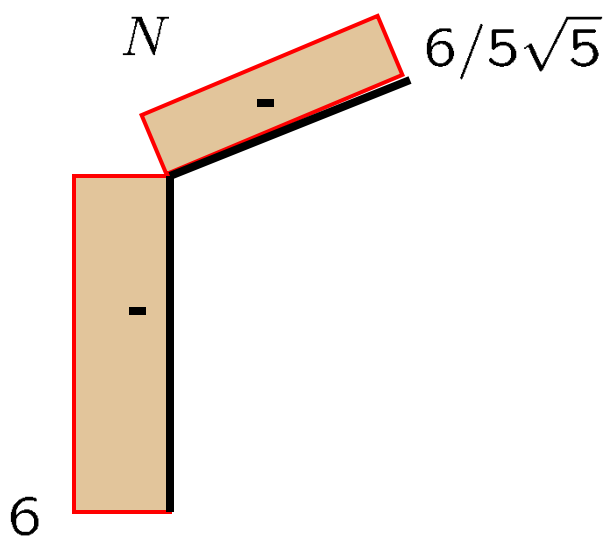


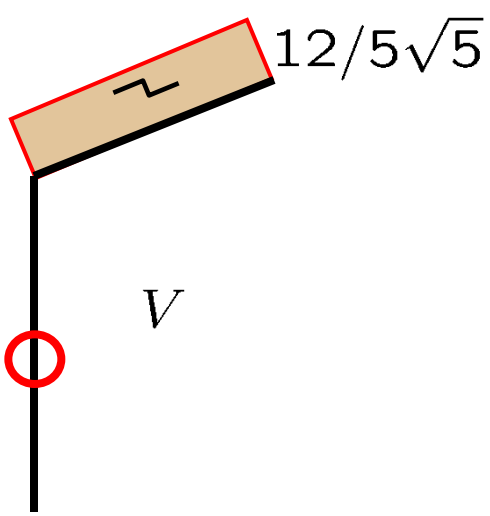
Derive the normal-force, shear-force and bending moment diagrams for this structure.

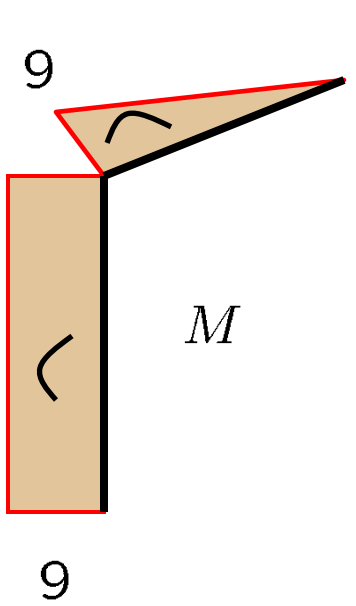

N
4
6
+
-
+
4
V
6
4
4
10
M
30
30
12
42
30

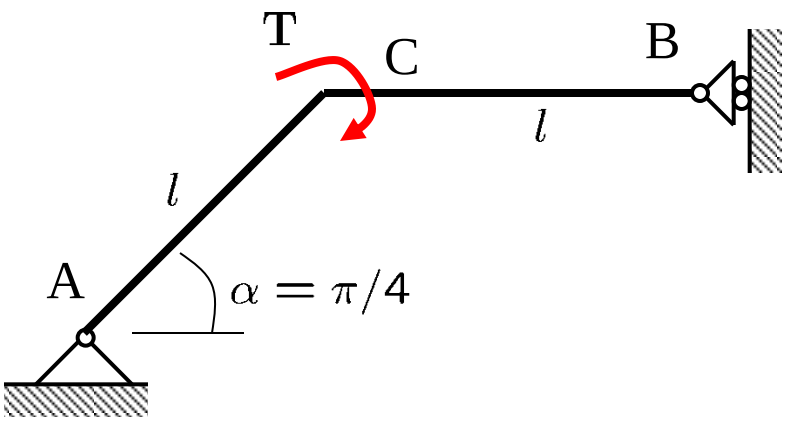


Derive the normal-force, shear-force and bending moment diagrams for this structure.

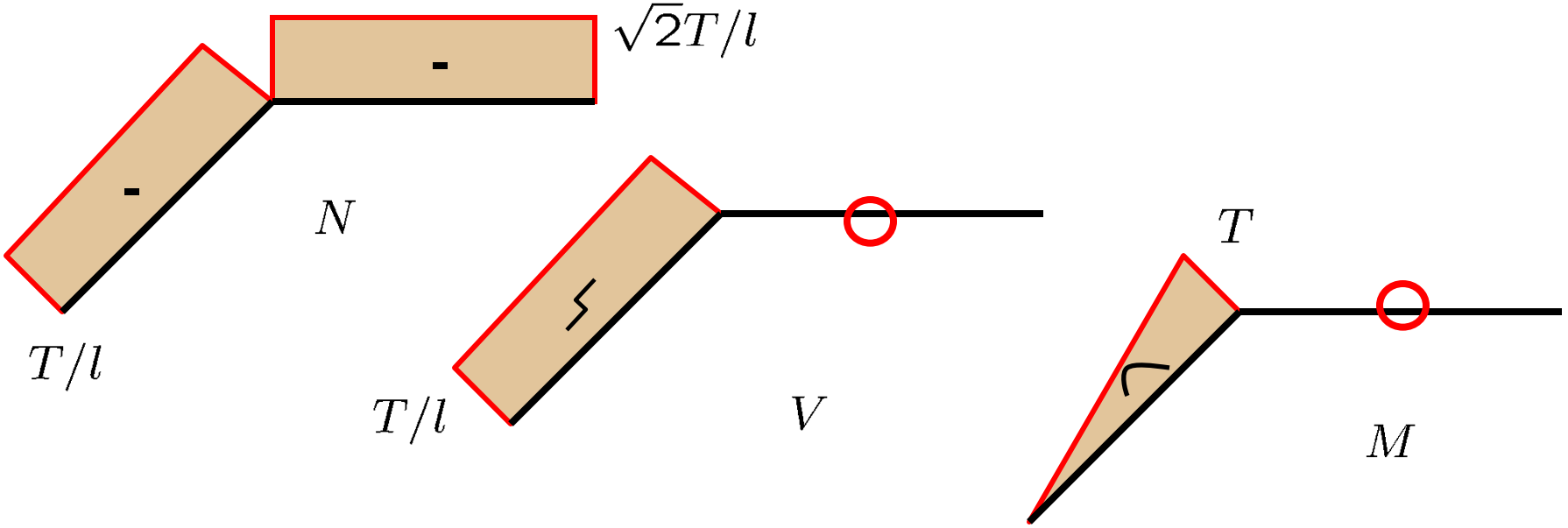

N
6/5√5
-
-
6

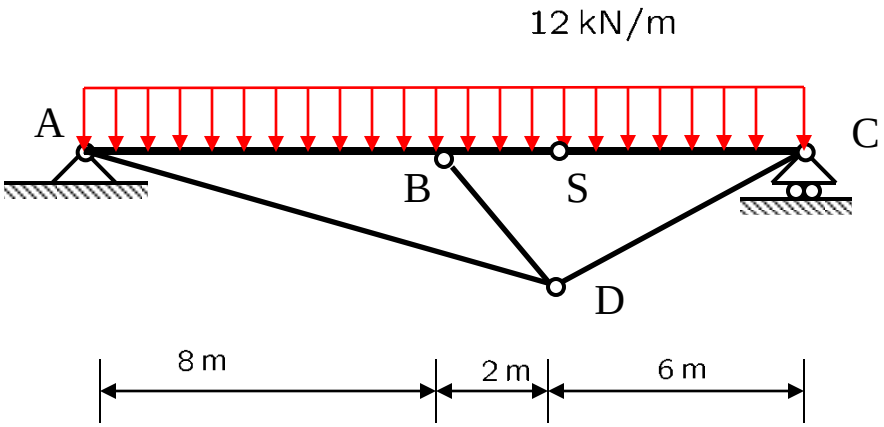

12/5√5
V


9
M
9



Derive the normal-force, shear-force and bending moment diagrams for this structure due to the concentrated moment **T**.

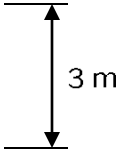

$\sqrt{2}T/l$
-
-
N
T/l
T/l
V
T
M



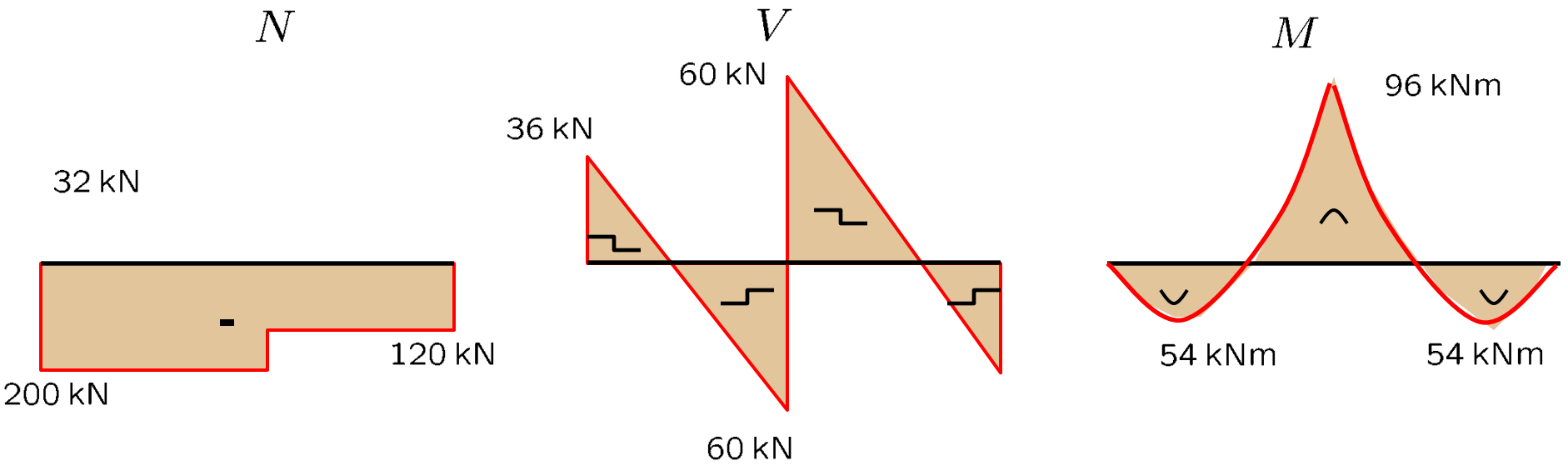
a) Calculate the reactions in A and C

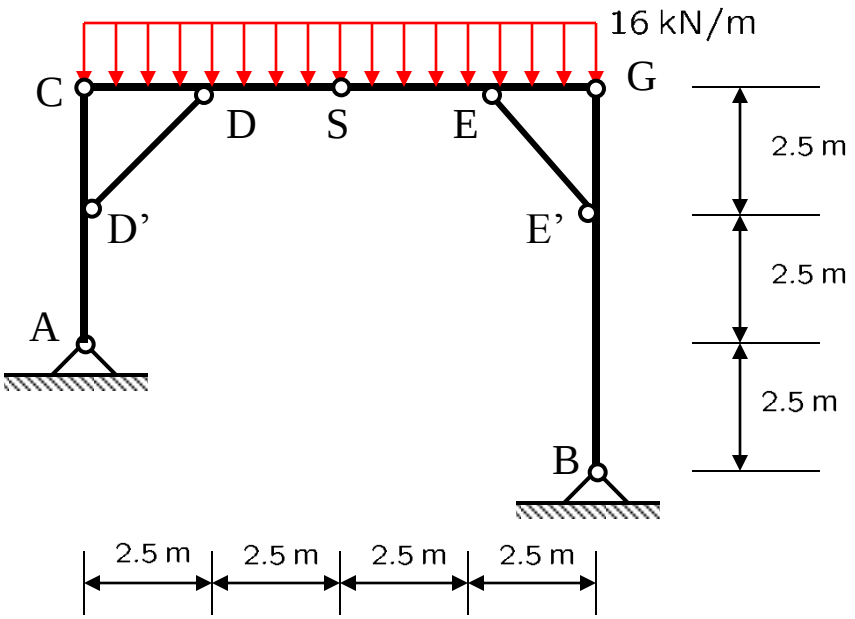
b) Calculate the normal forces in AD, BD and CD.

c) Draw the *N*, *V* and *M* lines for ABSC



d) Calculate the maximum bending moment

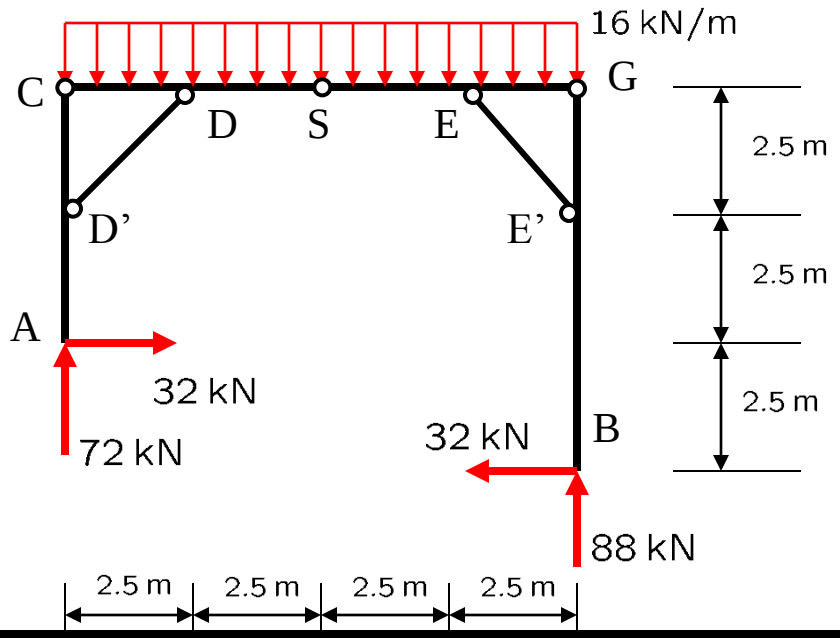

N
32 kN
120 kN
200 kN
V
60 kN
36 kN
60 kN
M
96 kNm
54 kNm
54 kNm



a) Calculate the reactions in A and B

b) Calculate the normal forces in DD' and EE' with the correct signs for tension and compression.

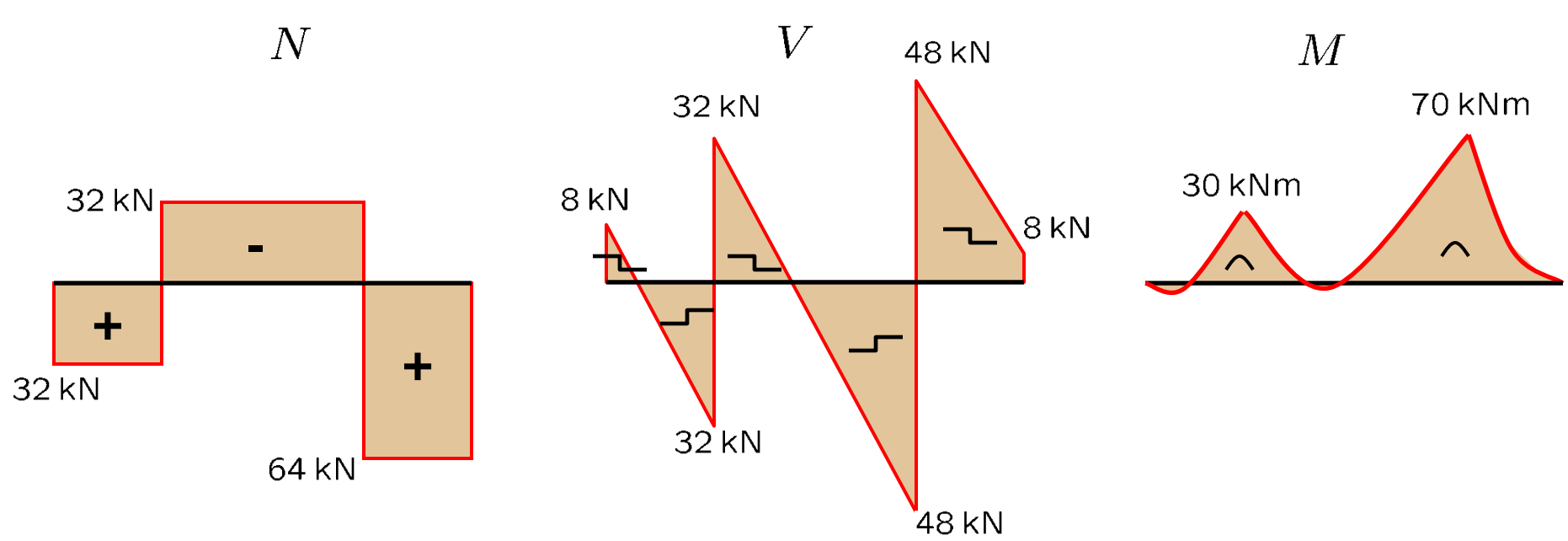
c) Draw the *N*, *V* and *M* lines for CDSEG



a) Calculate the reactions in A and B

b) Calculate the normal forces in DD' and EE' with the correct signs for tension and compression.

c) Draw the *N*, *V* and *M* lines for CDSEG


N
32 kN
-
+
32 kN
+
64 kN
V
48 kN
32 kN
8 kN
8 kN
32 kN
48 kN
M
70 kNm
30 kNm

A few tips…

- When drawing N,V and M lines, clearly denote the jumps and kinks in the lines. Give the values of ‘special’ points on the curves (maxima, transition points).

A few tips…

- Use enough paper, work neatly. It will reduce the number of unnecessary mistakes.
- Before filling in the answering sheet, draw the N,V and M diagrams on a piece of scrap paper.