Remarks: See §5.1, page 154 till 162

Answers: all forces in kN, N positive as a tensile force

1a. $A_v = 0\,;\ B_v = 40\ (\downarrow)\,;\ C_h = 30\ (\leftarrow)\,;\ C_v = 40\ (\uparrow)$

1b. $N^{(a)} = 0\,;\ N^{(b)} = +40\,;\ N^{(c)} = -50$

2a. $A_v = 10\ (\uparrow)\,;\ B_v = 20\ (\uparrow)\,;\ C_h = C_v = 0$

2b. $N^{(a)} = -10\,;\ N^{(b)} = -20\,;\ N^{(c)} = 0$

3a. $A_v = 9\ (\downarrow)\,;\ B_v = 41\ (\downarrow)\,;\ C_h = 24\ (\leftarrow)\,;\ C_v = 32\ (\uparrow)$

3b. $N^{(a)} = +9\,;\ N^{(b)} = +41\,;\ N^{(c)} = -40$

4a. $A_v = 12\ (\uparrow)\,;\ B_v = 12\ (\downarrow)\,;\ C_h = 18\ (\leftarrow)\,;\ C_v = 24\ (\uparrow)$

4b. $N^{(a)} = -12\,;\ N^{(b)} = +12\,;\ N^{(c)} = -30$

5a. $A_v = 0\,;\ B_h = 30\ (\leftarrow)\,;\ B_v = 40\ (\downarrow)\,;\ C_v = 40\ (\uparrow)$

5b. $N^{(a)} = 0\,;\ N^{(b)} = +50\,;\ N^{(c)} = -40$

6a. $A_v = 10\ (\uparrow)\,;\ B_h = B_v = 0\,;\ C_v = 20\ (\uparrow)$

6b. $N^{(a)} = -10\,;\ N^{(b)} = 0\,;\ N^{(c)} = -20$

7a. $A_v = 9\ (\downarrow)\,;\ B_h = 24\ (\leftarrow)\,;\ B_v = 32\ (\downarrow)\,;\ C_v = 23\ (\uparrow)$

7b. $N^{(a)} = +9\,;\ N^{(b)} = +40\,;\ N^{(c)} = -23$

8a. $A_v = 12\ (\uparrow)\,;\ B_h = 18\ (\leftarrow)\,;\ B_v = 24\ (\downarrow)\,;\ C_v = 36\ (\uparrow)$

8b. $N^{(a)} = -12\,;\ N^{(b)} = +30\,;\ N^{(c)} = -36$

9a. $A_v = 20\ (\downarrow)\,;\ B_h = 30\ (\leftarrow)\,;\ B_v = 20\ (\uparrow)$

9b. $N^{(a)} = +20\,;\ N^{(b)} = -50\,;\ N^{(c)} = +20$

10a. $A_v = 10\ (\uparrow)\,;\ B_h = 0\,;\ B_v = 20\ (\uparrow)$

10b. $N^{(a)} = -10\,;\ N^{(b)} = 0\,;\ N^{(c)} = -20$

11a. $A_v = 25\ (\downarrow)\,;\ B_h = 24\ (\leftarrow)\,;\ B_v = 7\ (\uparrow)$

11b. $N^{(a)} = +25\,;\ N^{(b)} = -40\,;\ N^{(c)} = +25$

12a. $A_v = 0\,;\ B_h = 18\ (\leftarrow)\,;\ B_v = 24\ (\uparrow)$

12b. $N^{(a)} = 0\,;\ N^{(b)} = -30\,;\ N^{(c)} = 0$

see next page ▼

Remark:

In all cases the diagonal beam transports the horizontal component of the load. The force in the diagonal beam is determent by the horizontal component of the load.

Exercises 1, 4, 5, 8, 9 and 12 are suitable for graphic solution

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