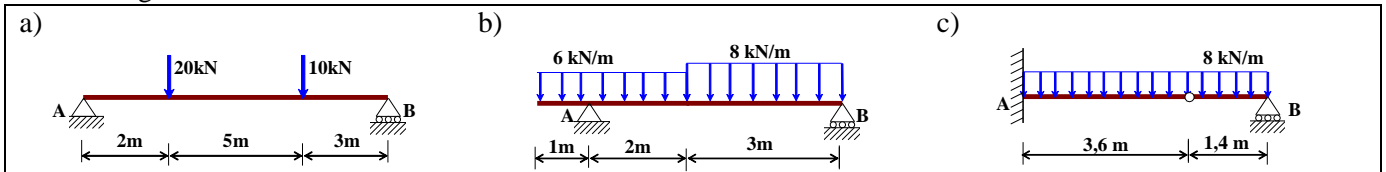
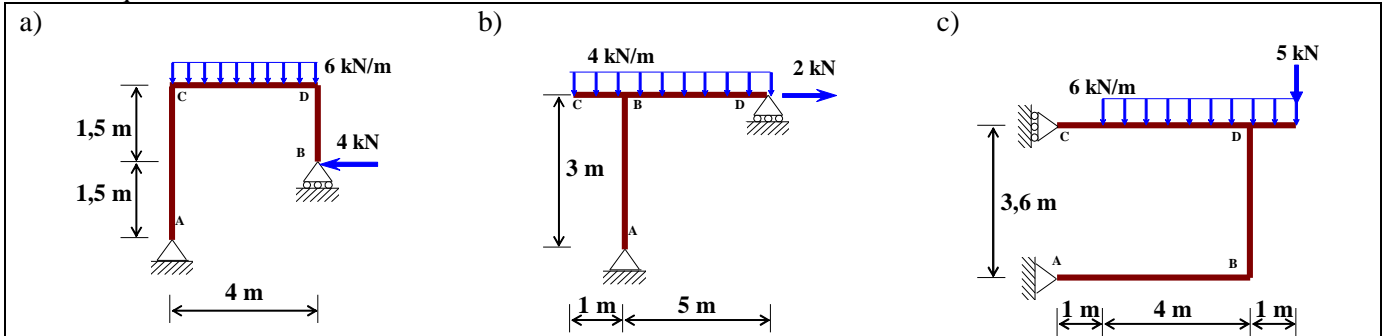


Lista de Exercícios – Calcule as reações de apoio

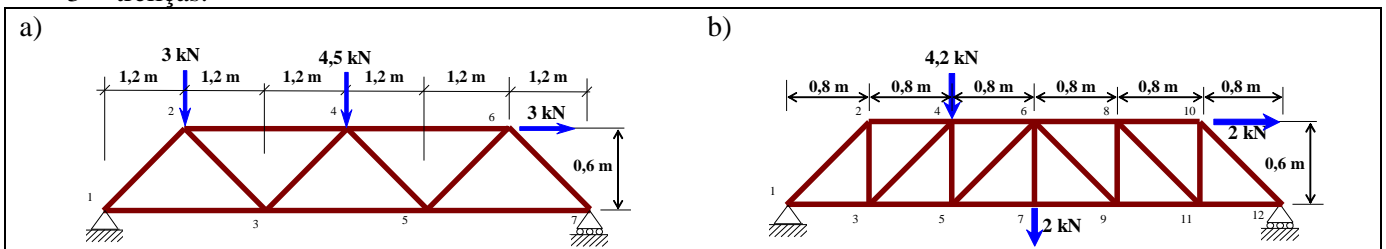
1- vigas:



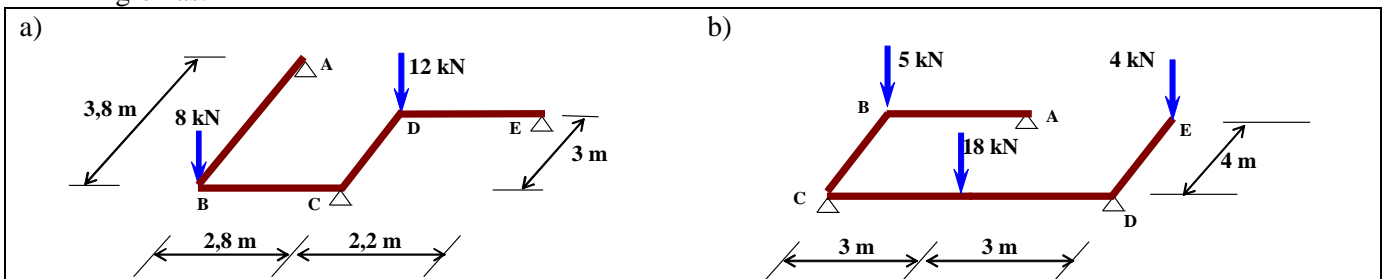
2- quadros:



3- treliças:



4- grelhas:



+M↺ +H→ +V↑

1 - a) $H_A=0$ kN; $V_A=19$ kN; $V_B=11$ kN b) $H_A=0$ kN; $V_A=23,4$ kN; $V_B=18,6$ kN c) $H_A=0$ kN; $M_A=72$ kN.m; $V_A=34,4$ kN; $V_B=5,6$ kN

2 - a) $H_A=4$ kN; $V_A=13,5$ kN; $V_B=10,5$ kN b) $H_A=-2$ kN; $V_A=13,2$ kN; $V_D=10,8$ kN c) $H_A=37,5$ kN; $H_C=-37,5$ kN; $V_A=35$ kN

3 - a) $H_1=-3$ kN; $V_1=4,5$ kN; $V_7=3$ kN b) $H_1=-2$ kN; $V_1=3,55$ kN; $V_{12}=2,65$ kN

4 - a) $V_A=8,73508$ kN; $V_C=10,3294$ kN; $V_E=0,935561$ kN b) $V_A=9$ kN; $V_C=9,5$ kN; $V_D=8,5$ kN