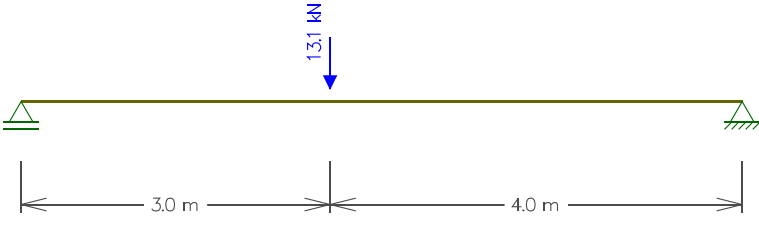
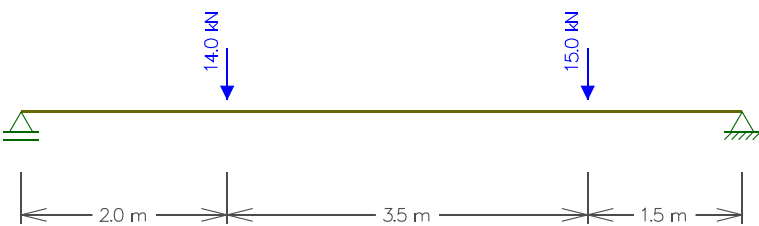
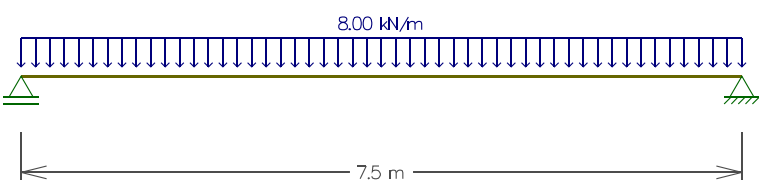
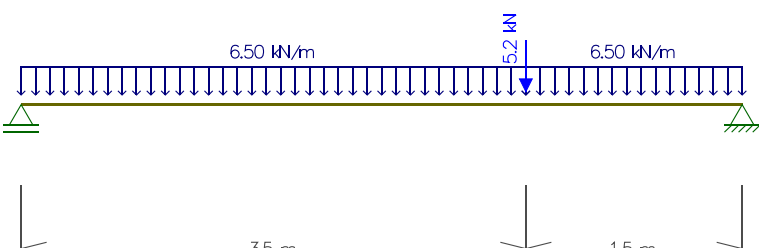
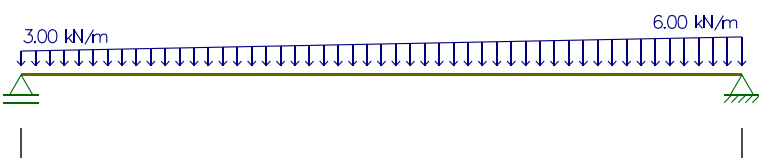
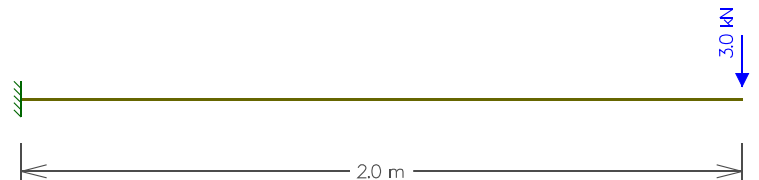
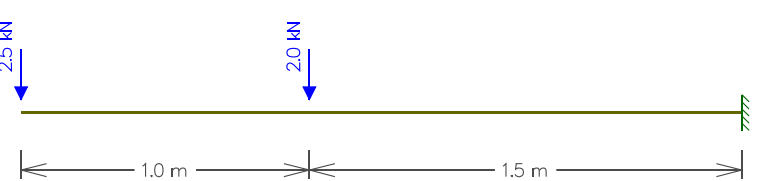
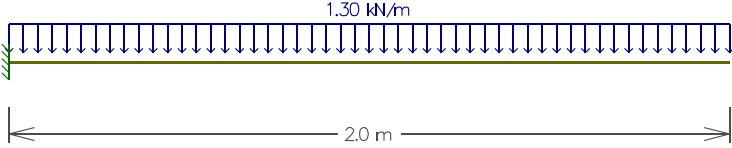
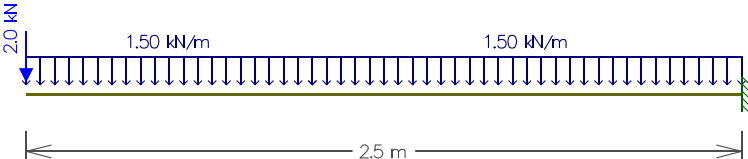
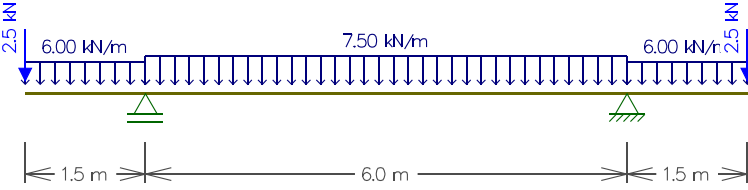


Método da Carga Unitária

Cálculo de deslocamento em vigas isostáticas – Lista de Exercícios

Calcule os deslocamentos verticais (flechas) das vigas abaixo, utilizando o Método da Carga Unitária. Considere apenas os esforços de momentos fletores, ou seja, despreze a influência dos esforços cortantes. Nas vigas biapoiadas, calcule os deslocamentos verticais nas seções localizadas entre os apoios (no meio do vão), Nas vigas engastadas, calcule os deslocamentos verticais nas seções localizadas nas extremidades livres. Veja ao lado da viga, as informações de material e seção transversal da viga.

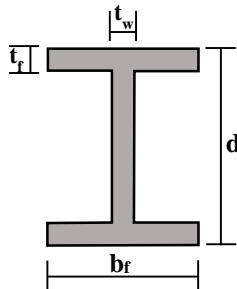
1)		Material: Aço A36 Box: $d=600$ mm $b_f=300$ mm $t_w=5$ mm $t_f=5$ mm
2)		Material: Aço A36 Perfil I: $d=600$ mm $b_f=300$ mm $t_w=5$ mm $t_f=5$ mm
3)		Material: Aço A36 Tubo: $d=600$ mm $t=5$ mm
4)		Material: Madeira Cedro Amargo Círculo: $d=400$ mm
5)		Material: Madeira Retângulo: $d=400$ mm $b_f=200$ mm
6)		Material: Madeira Angelim-Pedra Retângulo: $d=250$ mm $b_f=250$ mm
7)		Material: Madeira Ipê Perfil T: $d=400$ mm $b_f=250$ mm $t_w=50$ mm $t_f=50$ mm

8)		Material: Madeira Cedro Amargo Círculo: $d=200$ mm
9)		Material: Madeira Angelim-Pedra Retângulo: $d=300$ mm $b_f=200$ mm
10)		Material: Aço A36 Box: $d=600$ mm $b_f=200$ mm $t_w=3$ mm $t_f=3$ mm

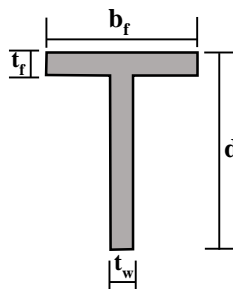
Materiais (E - Módulo de elasticidade):

- Aço A36 → $E=205$ GPa
- Madeira Cedro Amargo → $E=9,84$ GPa
- Madeira Angelim-Pedra → $E=12,9$ GPa
- Madeira Ipê → $E=18,0$ GPa

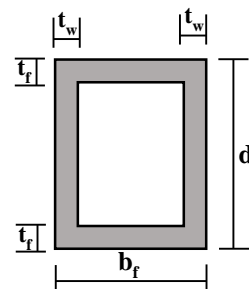
Seções Transversais (Ix – Momento de inércia):



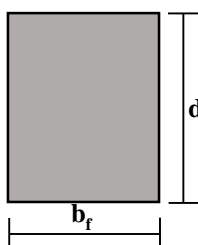
Perfil I



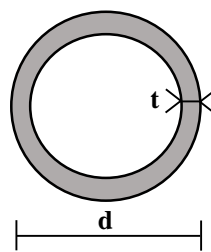
Perfil T



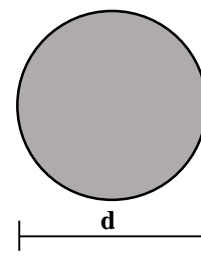
Box



Retângulo



Tubo



Círculo

Respostas: 1) $\delta=1,015$ mm↓; 2) $\delta=1,960$ mm↓; 3) $\delta=3,887$ mm↓;