

EXERCÍCIO 5.A

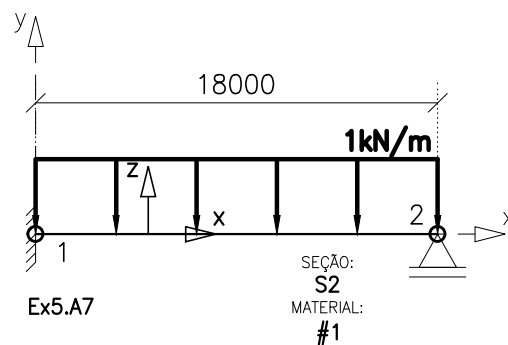
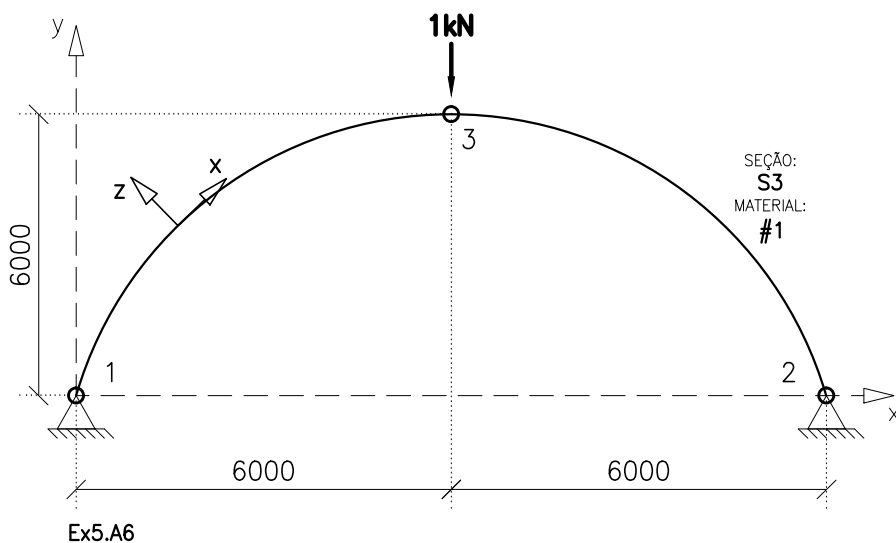
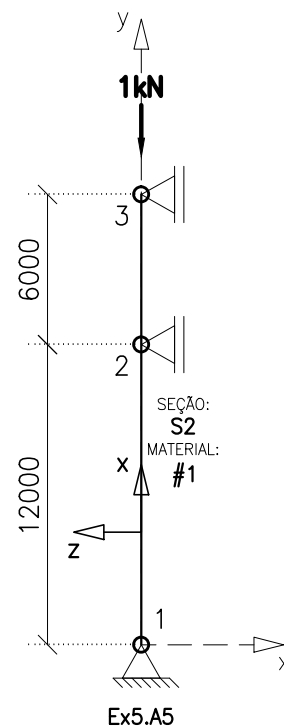
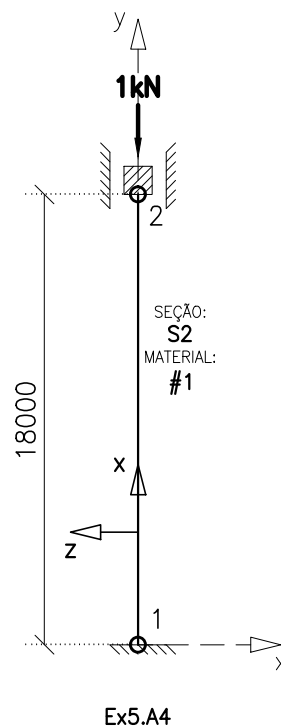
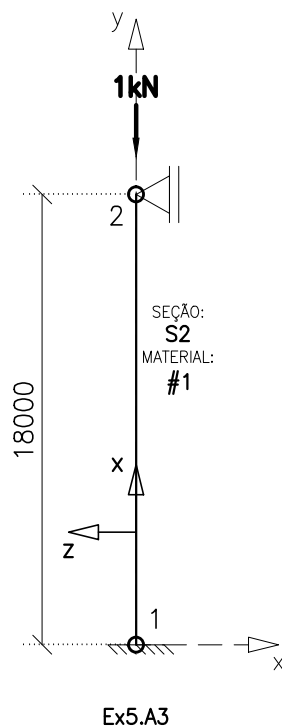
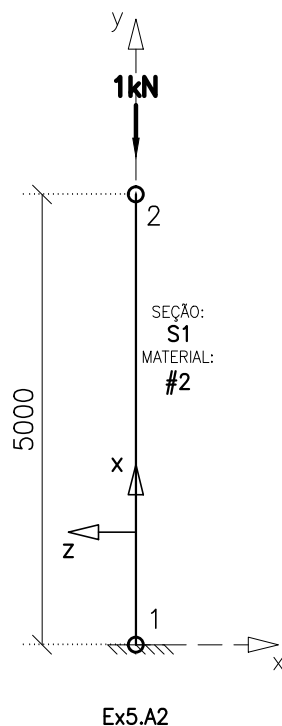
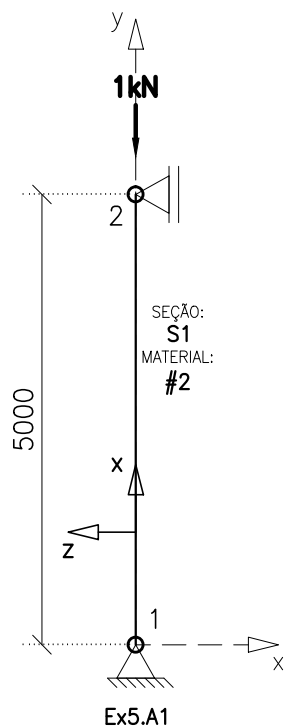
PROBLEMA:

CALCULAR A CARGA CRÍTICA DE FLAMBAGEM DAS BARRAS.

DADOS:

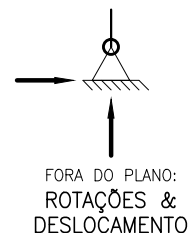
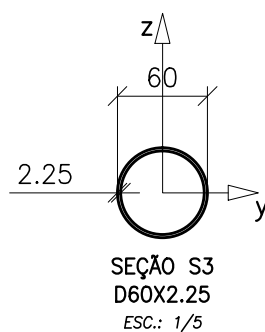
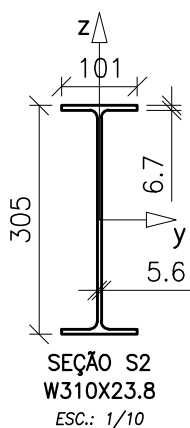
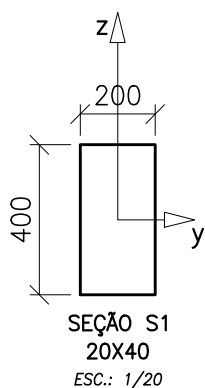
$$E_1 = 200\text{GPa} \quad E_2 = 23.8\text{GPa}$$

$$\nu_1 = 0.3 \quad \nu_2 = 0.2$$



ELEVÇÃO DAS BARRAS

S/ ESC. COTAS EM MILÍMETROS



SEÇÕES TRANSVERSAIS

ESC.: INDICADA COTAS EM MILÍMETROS

APOIOS (GRAUS DE LIBERDADE)

EXERCÍCIO 5.A

Análise de estabilidade de barras

[...]	[...]
/solu	Solution
ANTYPE,0	Analysis Type → New Analysis → Type of analysis = Static → OK
PSTRES,ON	Analysis Type → Sol'n Controls → Calculate prestress effects = ON → OK
SOLVE	Solve → Current LS → OK
/post1	General Postproc
SET,,1	Read Results → First Set
PLDISP	Plot Results → Deformed Shape → Items to be plotted = Def shape only → OK
PLNSOL,S,EQV	Plot Results → Contour Plot → Nodal Solu → Nodal Solution → Stress → von Mises stress → OK
/solu	Solution
ANTYPE,BUCKLE	Analysis Type → New Analysis → Type of analysis = Eigen Buckling → OK
BUCOPT,LANB,10,0,0,RAN GE	Analysis Type → Analysis Options → No. of modes to extract = 10 → OK
MXPAND,10,0,0,1,0.001	Load Step Opts → ExpansionPass → Single Expand → Expand Modes → No. of modes to expand = 10 Calculate elem results? = Yes → OK
SOLVE	Solve → Current LS → OK
/post1	General Postproc
SET,,1	Read Results → First Set
PLDISP	Plot Results → Deformed Shape → Items to be plotted = Def shape only → OK
SET,,2	Read Results → Next Set
PLDISP	Plot Results → Deformed Shape → Items to be plotted = Def shape only → OK
[...]	[...]
FINISH	Finish

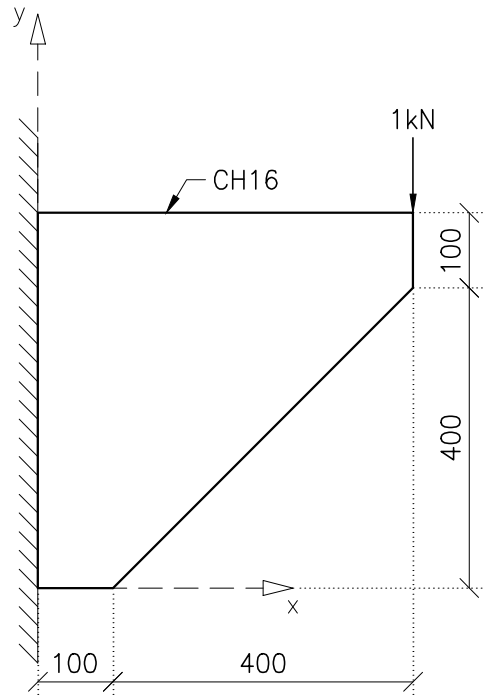
EXERCÍCIO 5.B

PROBLEMA:

CALCULAR AS CARGAS CRÍTICAS CORRESPONDENTES AOS 10 PRIMEIROS MODOS DE FLAMBAGEM DA CHAPA DE AÇO ABAIXO.

DADOS:

$E = 200\text{GPa}$
 $\nu = 0.3$



CHAPA ENGASTADA
 ESC.: 1/10 COTAS EM MILÍMETROS

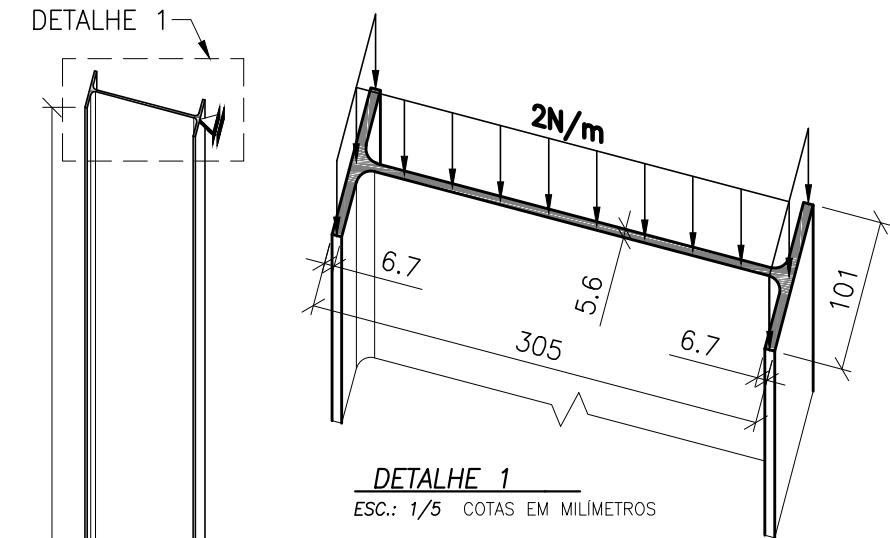
EXERCÍCIO 5.C

PROBLEMA:

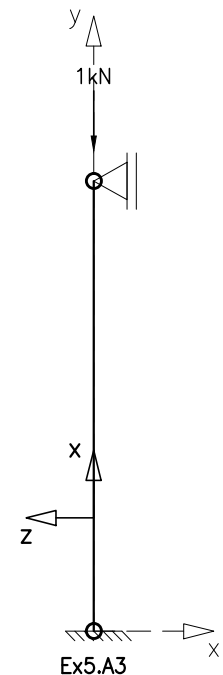
CALCULAR AS CARGAS CRÍTICAS CORRESPONDENTES AOS PRIMEIROS 10 MODOS DE FLAMBAGEM DA BARRA ABAIXO. MODELAR A BARRA COM ELEMENTOS DE CHAPA E COMPARAR RESULTADOS COM OS OBTIDOS NO EXERCÍCIO Ex5.A3.

DADOS:

$E = 200\text{GPa}$
 $\nu = 0.3$



ELEVAÇÃO DO PILAR
 ESC.: 1/40 COTAS EM MILÍMETROS



MODELO ESQUEMÁTICO