

Méthode des déplacements (corrigé)

Ex1

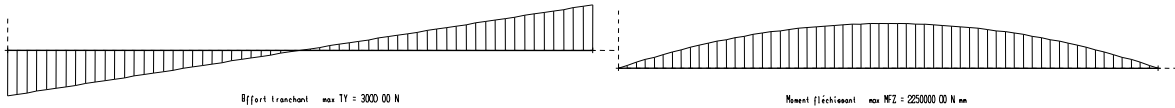
K matrice de rigidité unités : N, mm

478833600	239416800
239416800	478833600

rotations (rad)

W1	-6.265E-03
W2	6.265E-03

M12 (Nm) = 0.0	V12 (N) = 3000.0	Y1 (N) = 3000.0
M21 (Nm) = 0.0	V21 (N) = 3000.0	Y2 (N) = 3000.0

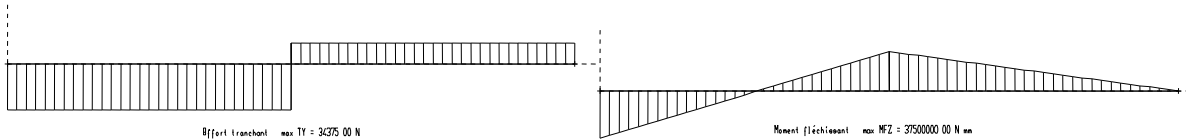


Ex2

rotations (rad)

W1	0.000E+00
W2	6.126E-03

M12 (Nm) = 37500.0	V23 (N) = 34375.0	Y3 (N) = 15625.0
M21 (Nm) = 0.0	V32 (N) = 15625.0	Y4 (N) = 0.0



Ex 3

K matrice de rigidité unités : N, mm

5440870400	2720435200	0
2720435200	1.3602E+10	4080652800
0	4080652800	8161305600

K-1 matrice de souplesse

2.083E-10	-4.9012E-11	2.4506E-11	-1.2253E-11
-4.9012E-11	9.8024E-11	-4.9012E-11	2.4506E-11
2.4506E-11	-4.9012E-11	1.4704E-10	-7.3518E-11

Efforts S M°

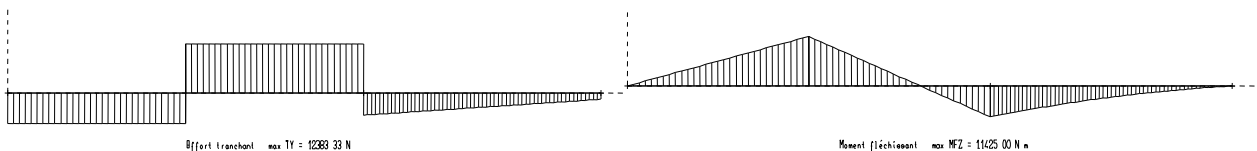
-7500000
6833333.33
666666.667

rotations (rad)

w1	-1.88E-03
w2	1.00E-03
w3	-4.21E-04

	850	-200	100
1/EI	-200	400	-200
	100	-200	600

M12 (Nm) = 0.0	V12 (N) = 7616.7	Y1 (N) = 7616.7
M21 (Nm) = -7150.0	V21 (N) = 12383.3	Y2 (N) = 17958.3
M23 (Nm) = 7150.0	V23 (N) = 5575.0	Y3 (N) = -1575.0
M32 (Nm) = 0.0	V32 (N) = -1575.0	



Ex 4

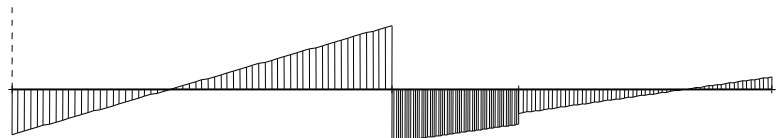
K matrice de rigidité unités
: N, mm

5440870400	2720435200	0	0
2720435200	12742931600	3651030600	0
0	3651030600	10953091800	1825515300
0	0	1825515300	3651030600

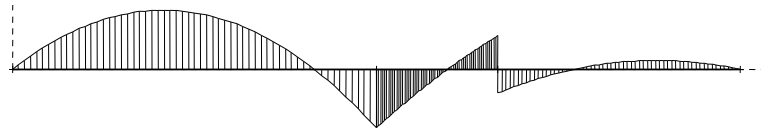
K⁻¹ matrice de souplesse

2,09E-10	-4,97E-11	1,81E-11	-9,04E-12	Efforts Σ M°	rotations (rad)
-4,97E-11	9,95E-11	-3,62E-11	1,81E-11	-1,50E+06	w1 -3,638E-04
1,81E-11	-3,62E-11	1,13E-10	-5,64E-11	1,42E+06	w2 1,763E-04
-9,04E-12	1,81E-11	-5,64E-11	3,02E-10	1,25E+06	w3 4,379E-05
				3,33E+05	w4 6,940E-05

M12 (Nm) = 0,0	V12 (N) = 2489,8	Y1 (N) = 2489,8
M21 (Nm) = -1530,6	V21 (N) = 3510,2	Y2 (N) = 6420,9
M23 (Nm) = 1530,6	V23 (N) = 2910,7	Y3 (N) = -600,7
M32 (Nm) = 880,1	V32 (N) = -1910,7	Y4 (N) = 690,0
M34 (Nm) = 619,9	V34 (N) = 1310,0	
M43 (Nm) = 0,0	V43 (N) = 690,0	



Effort tranchant max TY = 3510 19 N



Moment fléchissant max MFZ = 1549 76 N m