

### **QUESTION 1 (exercice de fatigue)**

$k_e = 0,702$  (le plus sévère)

$S_e = 160,6$  MPa

Chargement 1 :

$\sigma_{xa} = 50$  MPa ;  $\sigma_{xm} = 0$  ;  $\tau_{x\theta a} = 10$  Mpa ;  $\tau_{x\theta m} = 30$  MPa

$\sigma_{a'} = 52,91$  MPa

$\sigma_{m'} = 51,96$  MPa

$S_f = 197,1$  Mpa

$N_1 = 392\ 637$  cycles

Chargement 2:

$\sigma_{xa} = 62,5$  MPa ;  $\sigma_{xm} = 0$  ;  $\tau_{x\theta a} = 0$  ;  $\tau_{x\theta m} = 0$  ;

$S_f = 187,5$  MPa

$N_2 = 495\ 236$  cycles

**$n_2 = 457400$  cycles**