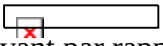
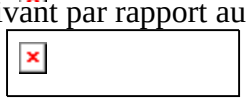
E3.4. Etude du circuit de Wien en régime transitoire.

1. Equation différentielle.

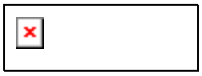
On applique la loi des mailles :

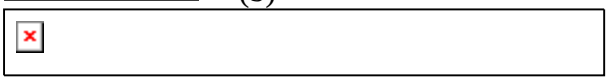


En dérivant par rapport au temps :

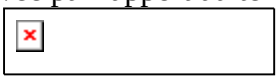
 (a)

Or :

 (b)



La dérivée par rapport au tempsde la tension *u* a pour expression :

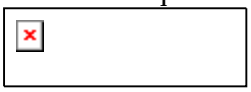
 (c)

En injectant les équations (b) et (c) dans (a), on obtient :

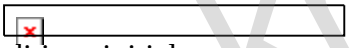
2. Expression de *v(t)*.

Le discriminant de l'équation caractéristique est :

Les solutions de l'équation caractéristique sont :

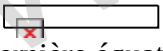
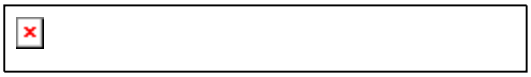


La tension *v* a pour expression :



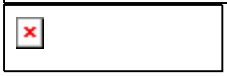
Les conditions initiales permettent de déterminer les constantes d'intégration *A* et *B* :

D'autre part :

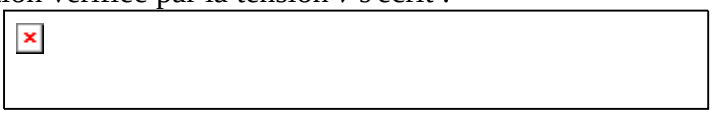
 et 

Cette dernière équation s'écrit à $t = 0$, sachant que $v(0) = 0$:

Soit :

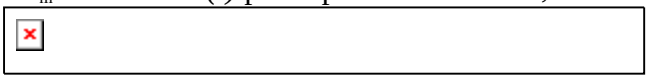


L'équation vérifiée par la tension *v* s'écrit :



3. Date du maximum.

A la date t_m la tension *v(t)* passe par un maximum, on a alors :



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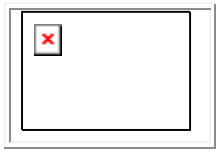
On obtient :



t_m = 0,86 ms

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