Devoir 3

William
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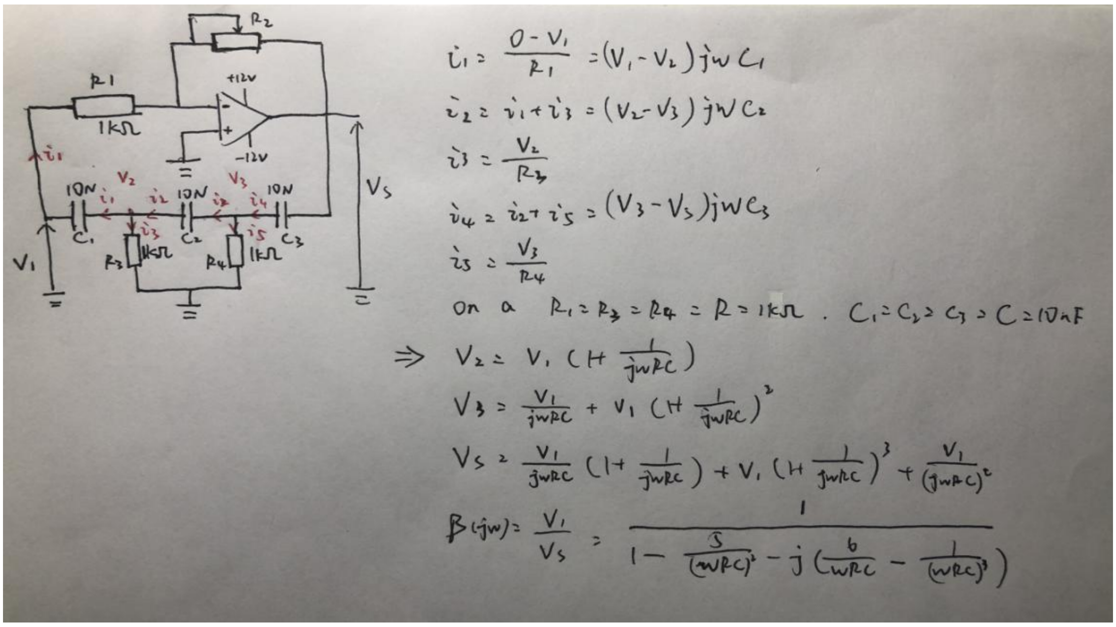
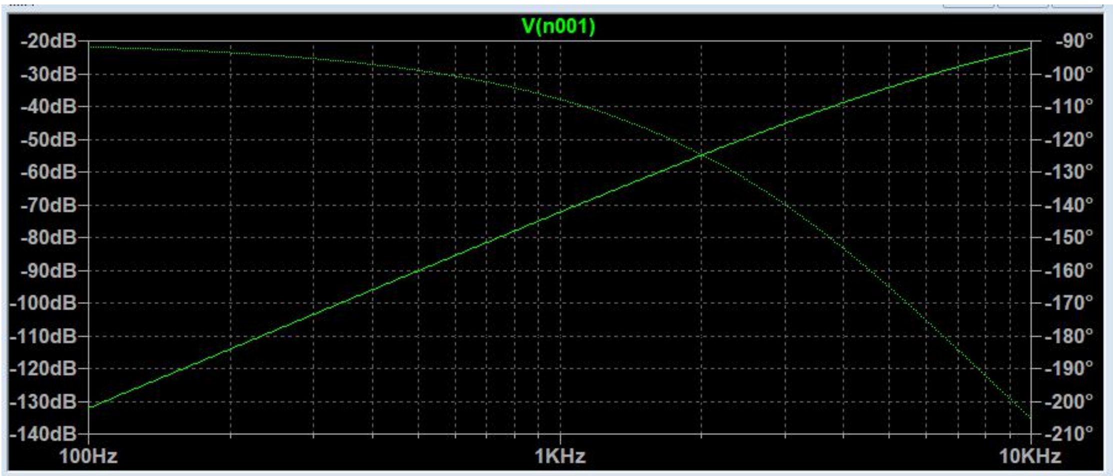
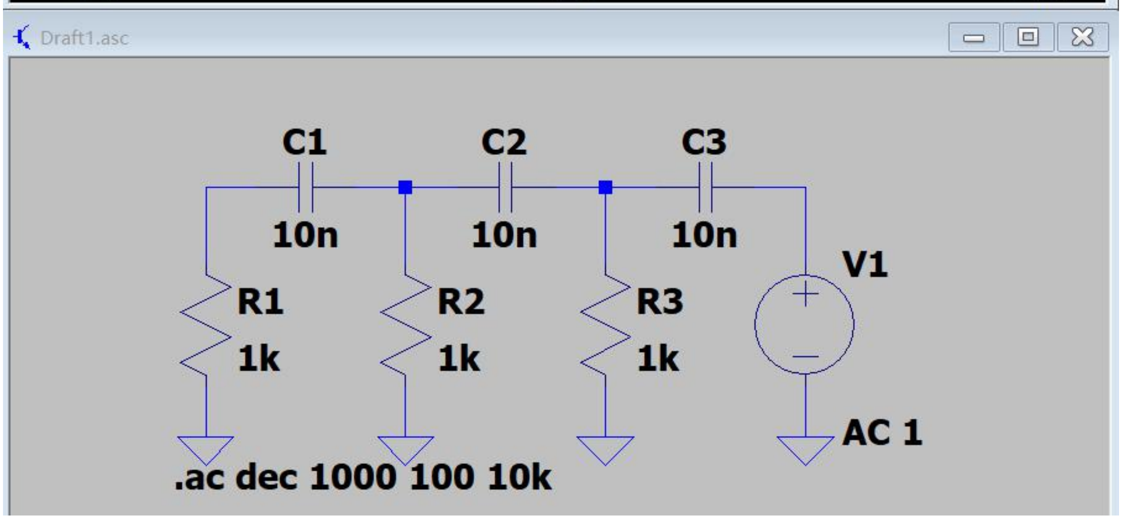
Q1



Q2





Q3

On sait que $f_0 = \dfrac{1}{2\pi\sqrt{6}RC} = 6497.47\text{Hz}$, $A = -\dfrac{1}{|\beta(jw)|} = -29$

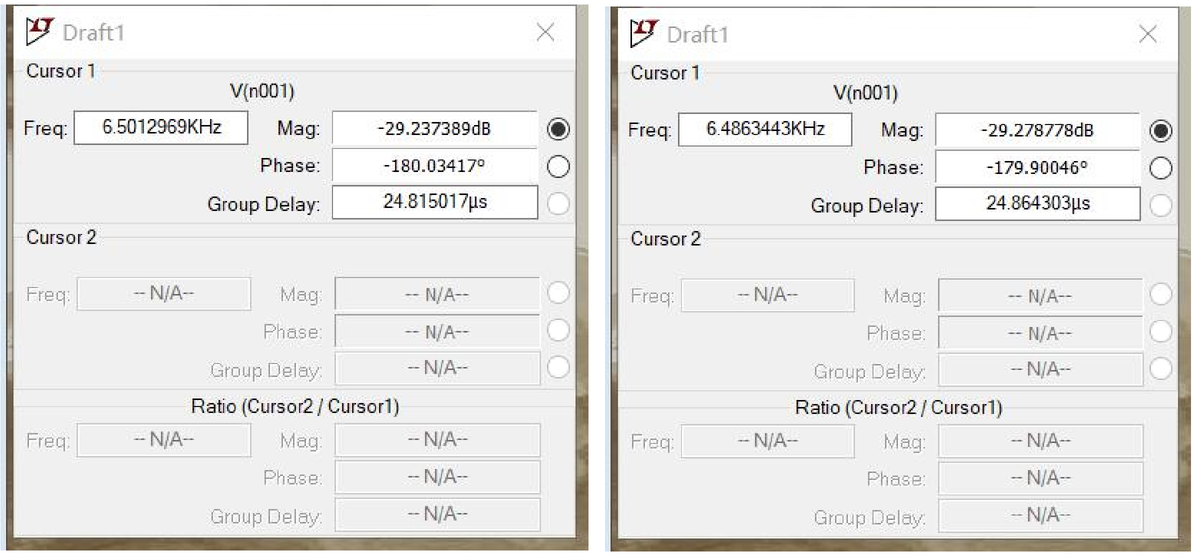
Dans la simulation :

En -180.03° , f0=6501.30Hz, A=-29.24

Q4

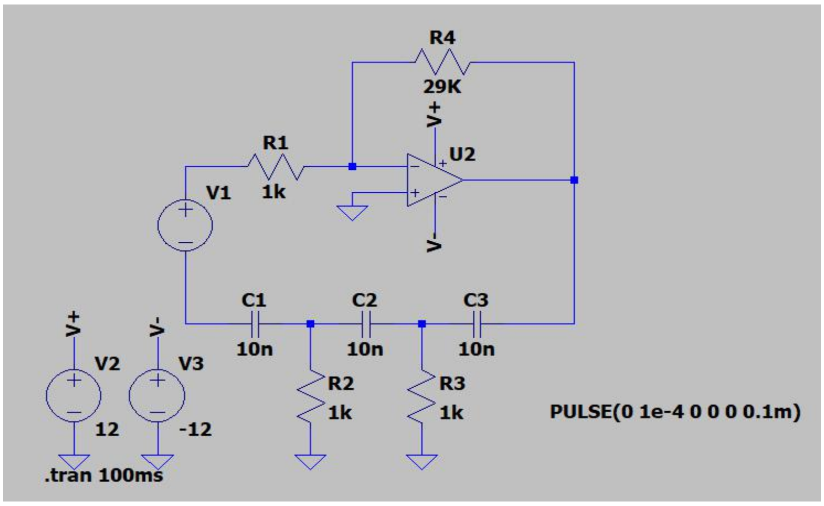
Dans le cours, $S(w_0)\dfrac{12}{29}\sqrt{6} \approx 1.01$

Dans la simulation, on prend deux points proche de -180°



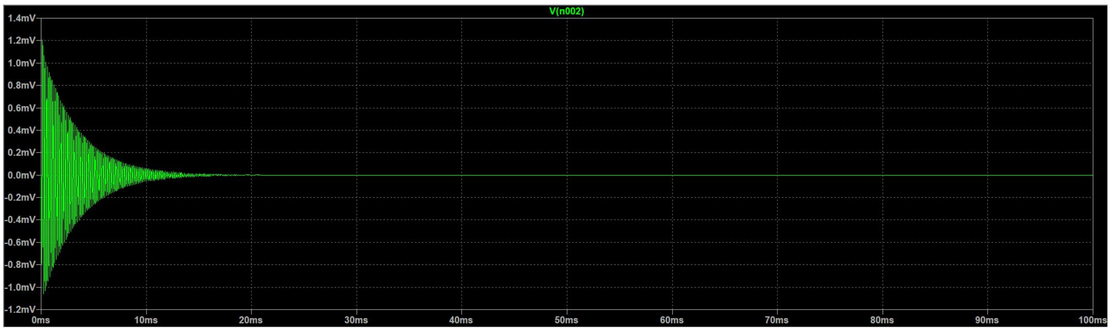
$$S(w_0) = \left|\frac{d\varphi(\beta(jw))}{d(w/w_0)}\right|_{w=w_0} = \left|\frac{w_0}{2\pi}\frac{d\varphi}{df}\right|_{f=f_0} = \left|\frac{w_0}{2\pi}\frac{-180.03+179.90}{6501.30-6486.34}\frac{\pi}{180}\right| = 0.98$$

Q5

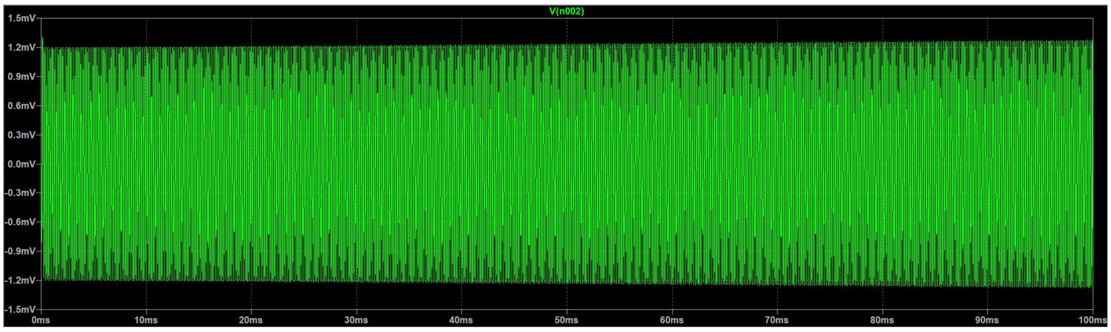


Q6

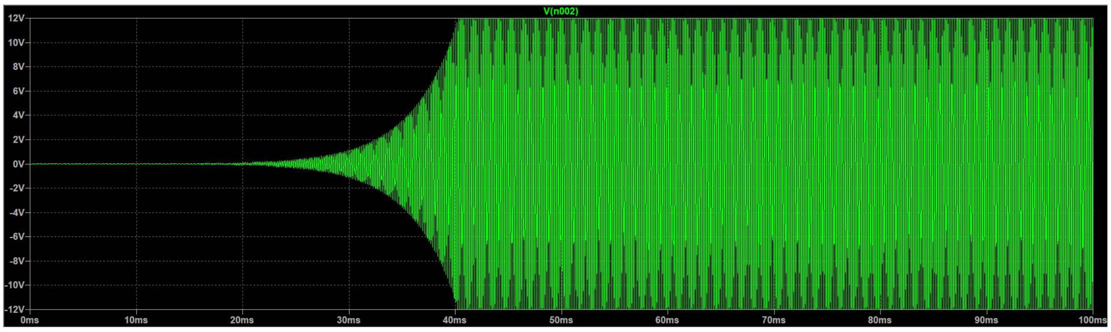
R4=28KΩ, $A\beta < 1$



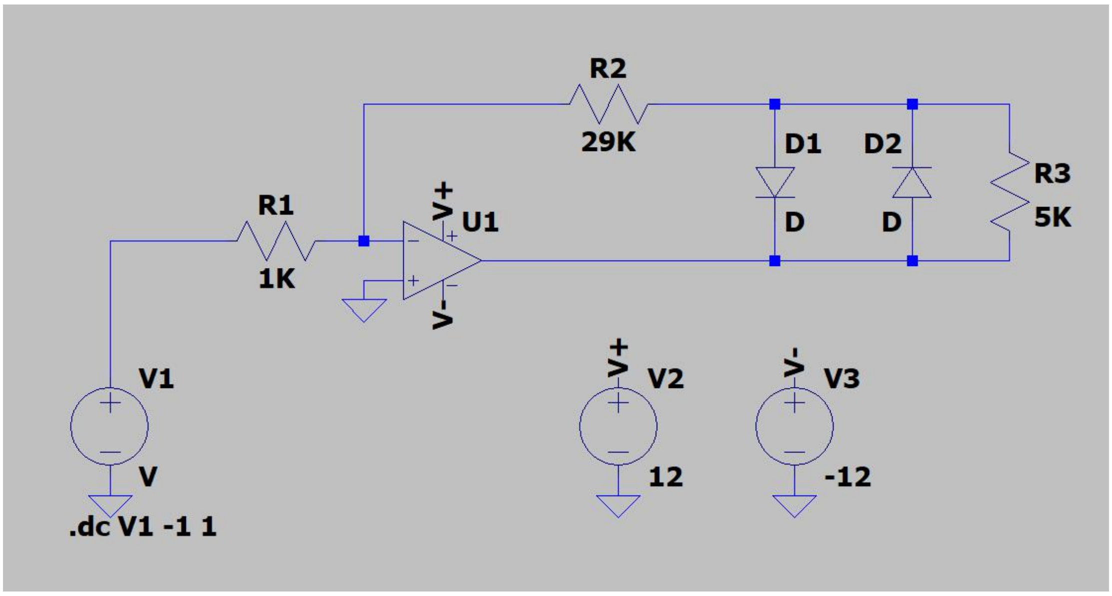
R4=29.095KΩ, $A\beta = 1$



R4=30KΩ, $A\beta > 1$

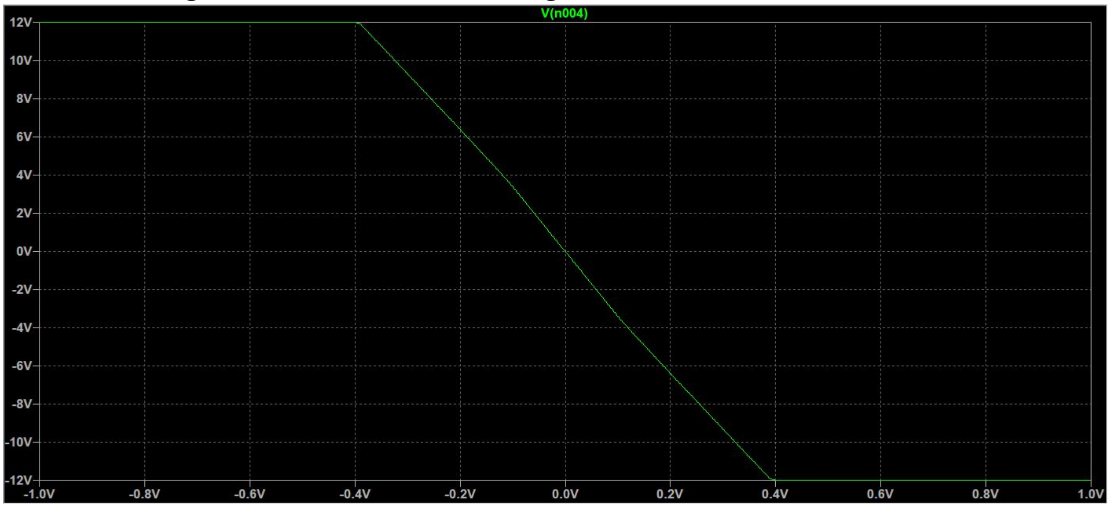


Q7



Q8

Quand R2 est grand, comme R2=29KΩ, le gain est linéaire



Quand R2 est petit, comme R2=3KΩ, le gain est non-linéaire