



Ain Shams University
Faculty of Engineering

Electronics Laboratory Report

E5

Submitted by :

SECTION (3)

G10

باسم اسامه وديع شفيق جرجس

باسم حسين فوزي ياقوت

باهر عبدالفتاح عطيه عبدالفتاح

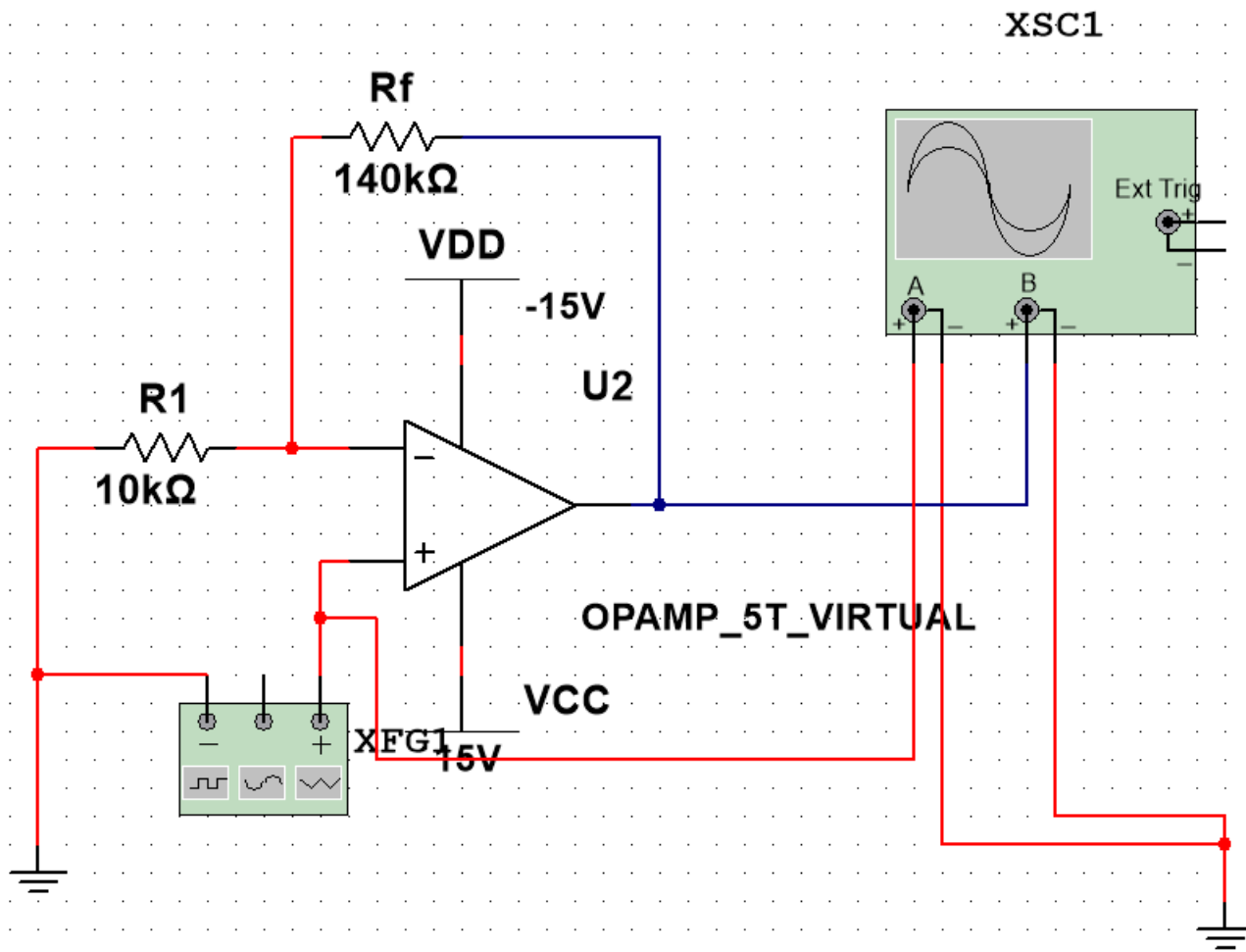
بسمة حسن محمد خليل

بسمة غريب عدلي علي

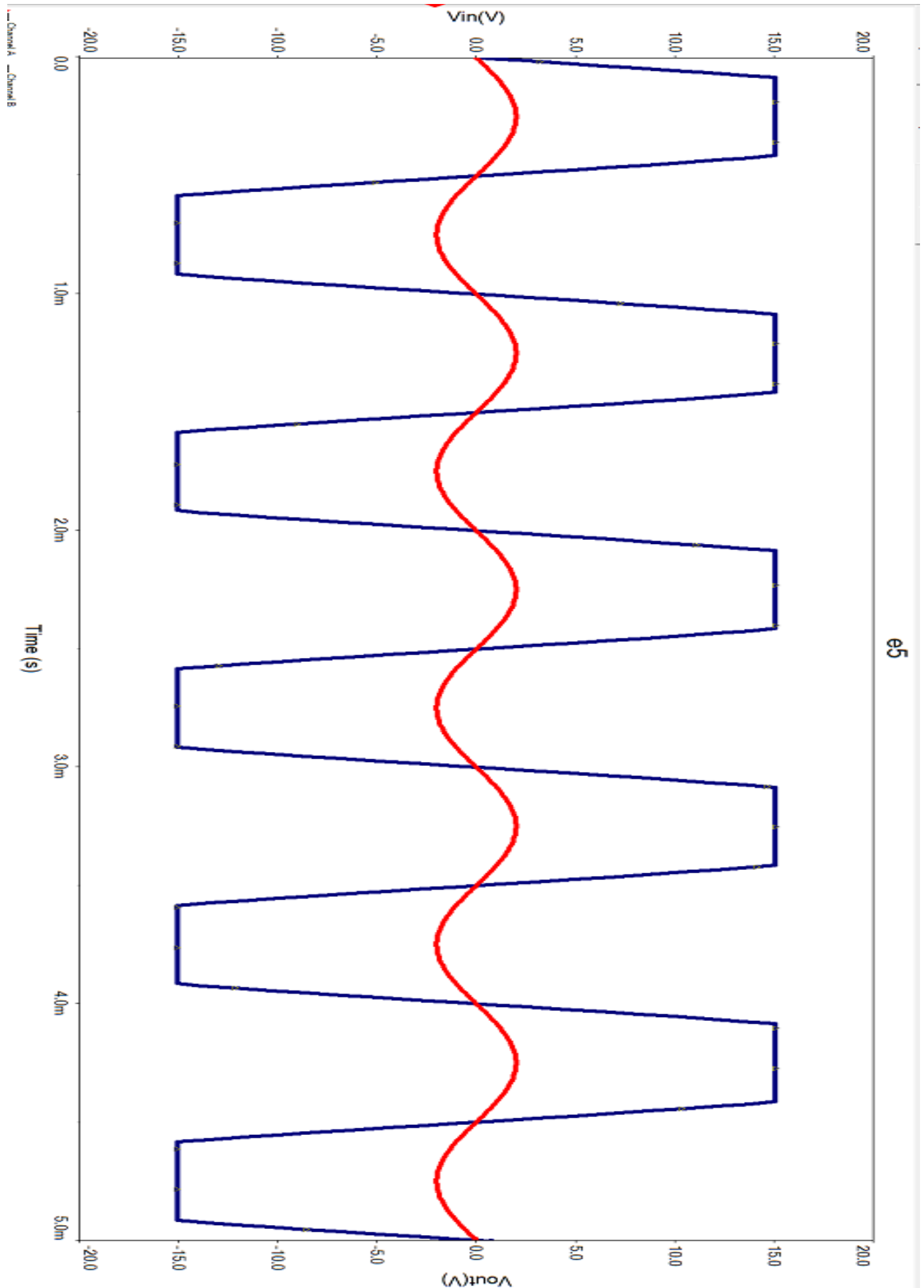
Report Code : **B140**

**Faculty of engineering ainshams university
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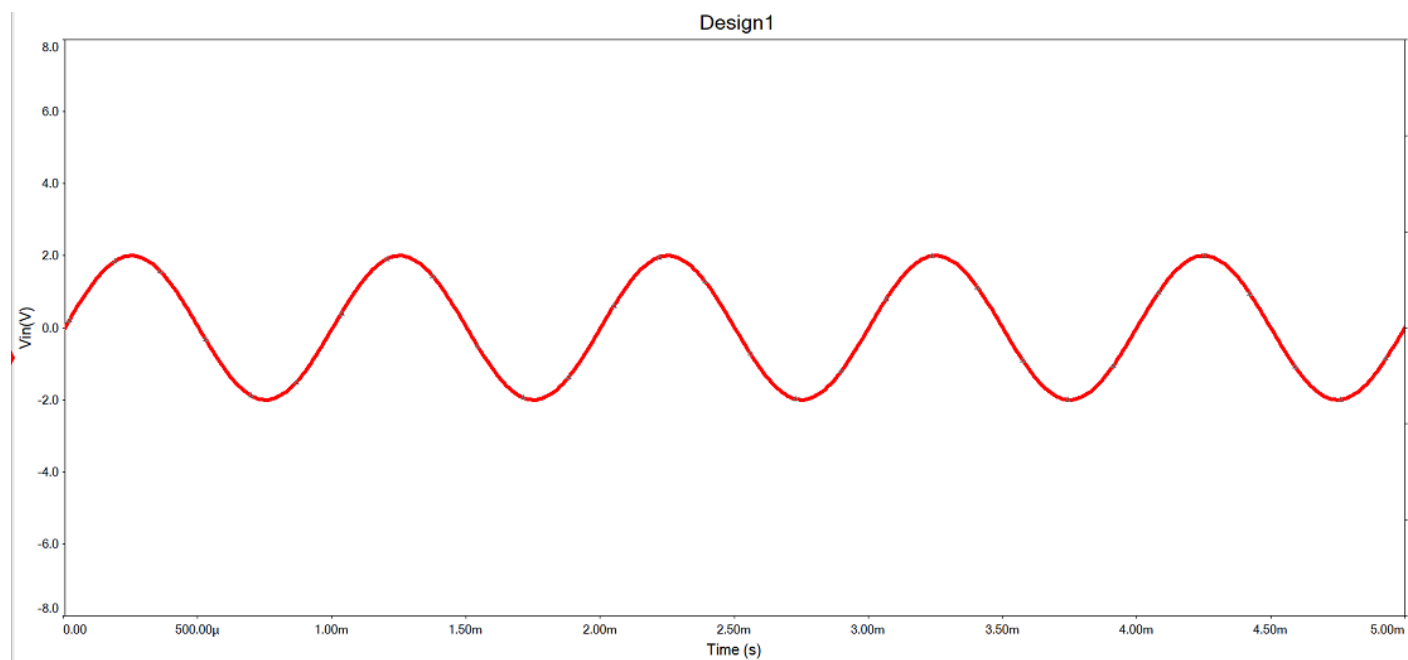
1-Circuit Diagram :



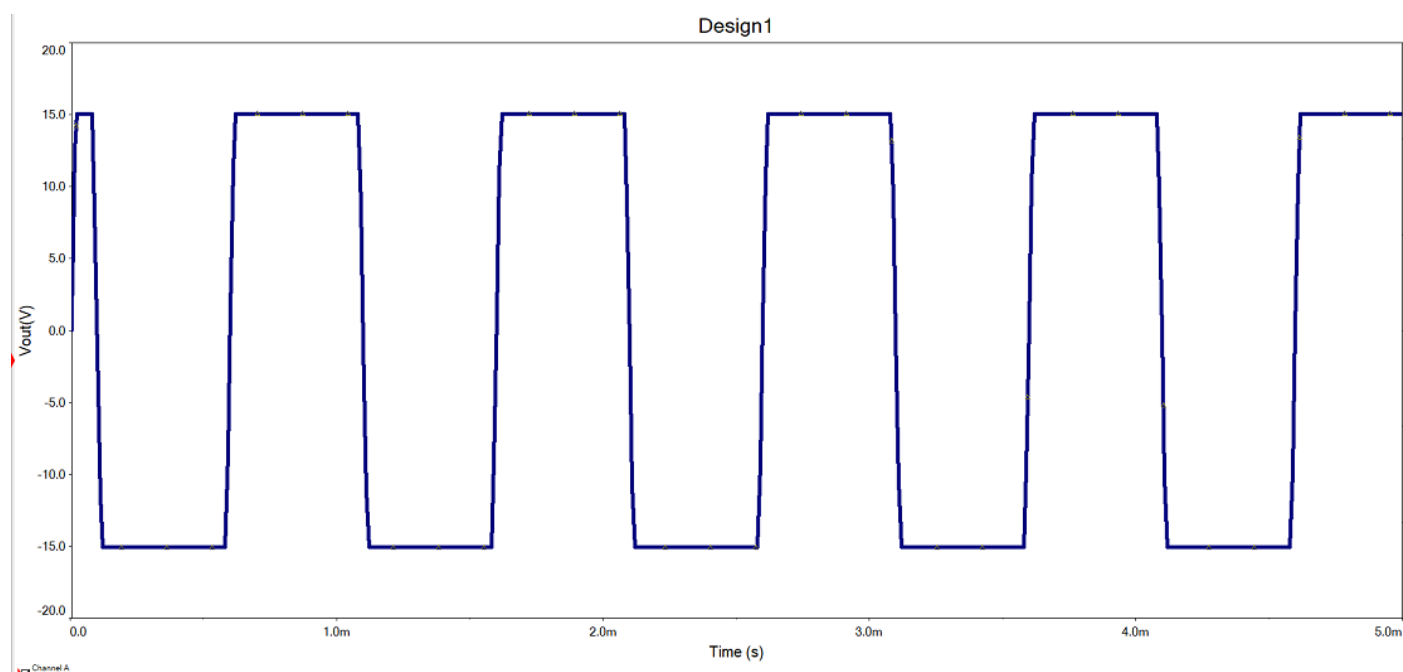
2)CRO snapshot displaying Vin & Vout:



Vin:



Vout:



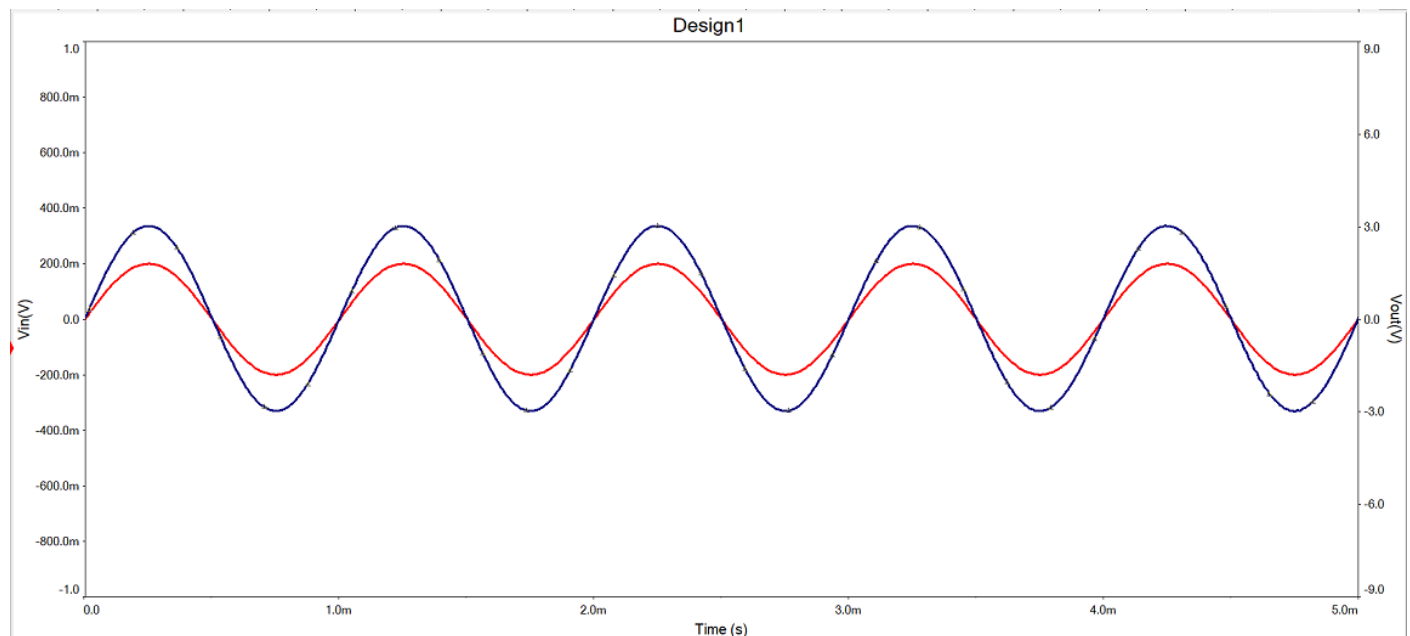
3) Calculate the voltage gain from simulation and compare it with the theoretical value using the equations :-

a) The voltage gain from simulation:

$$A_v = (V_{out}/V_{in}) = 15\text{V}/2\text{V} = 7.5$$

b) using equation $A_v = 1 + (R_f/R_1) = 1 + 140/10 = 15$

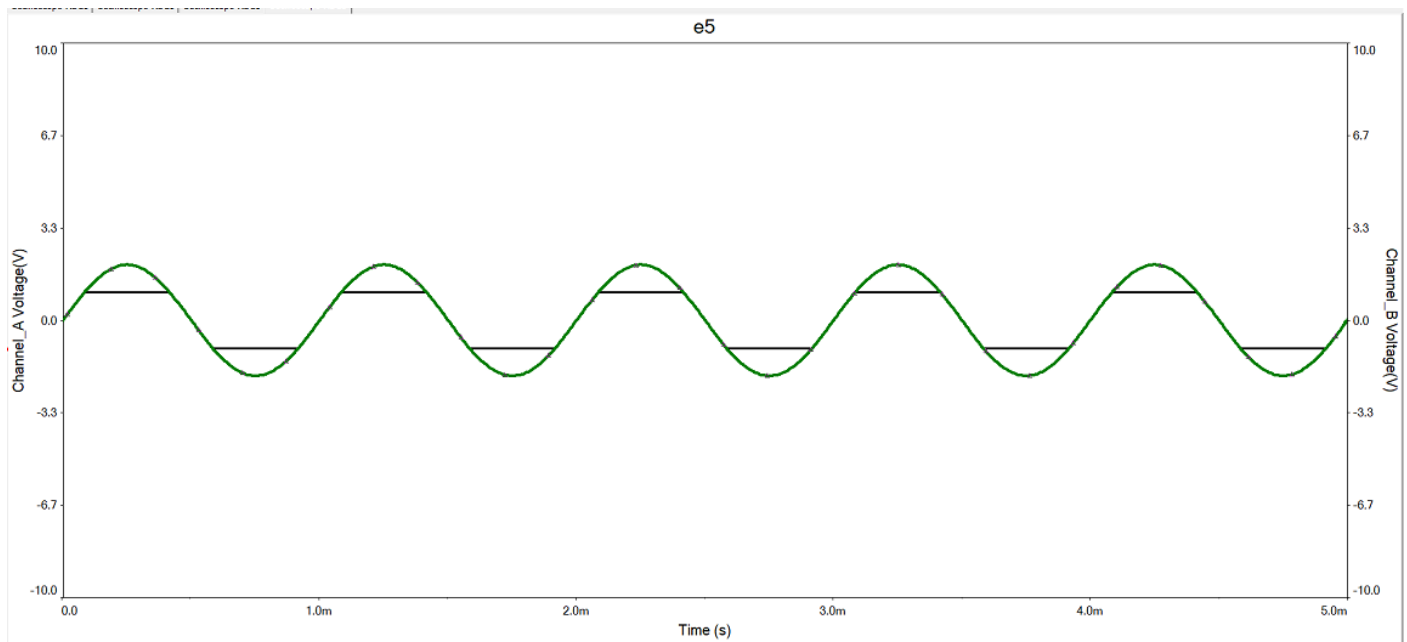
They are different due to the clipping that happens to the output voltage if we decrease the amplitude of the input voltage (for e.x $V_{in} = 200\text{mV}$)



Now $A_v = 3\text{V}/200\text{mV} = 15$

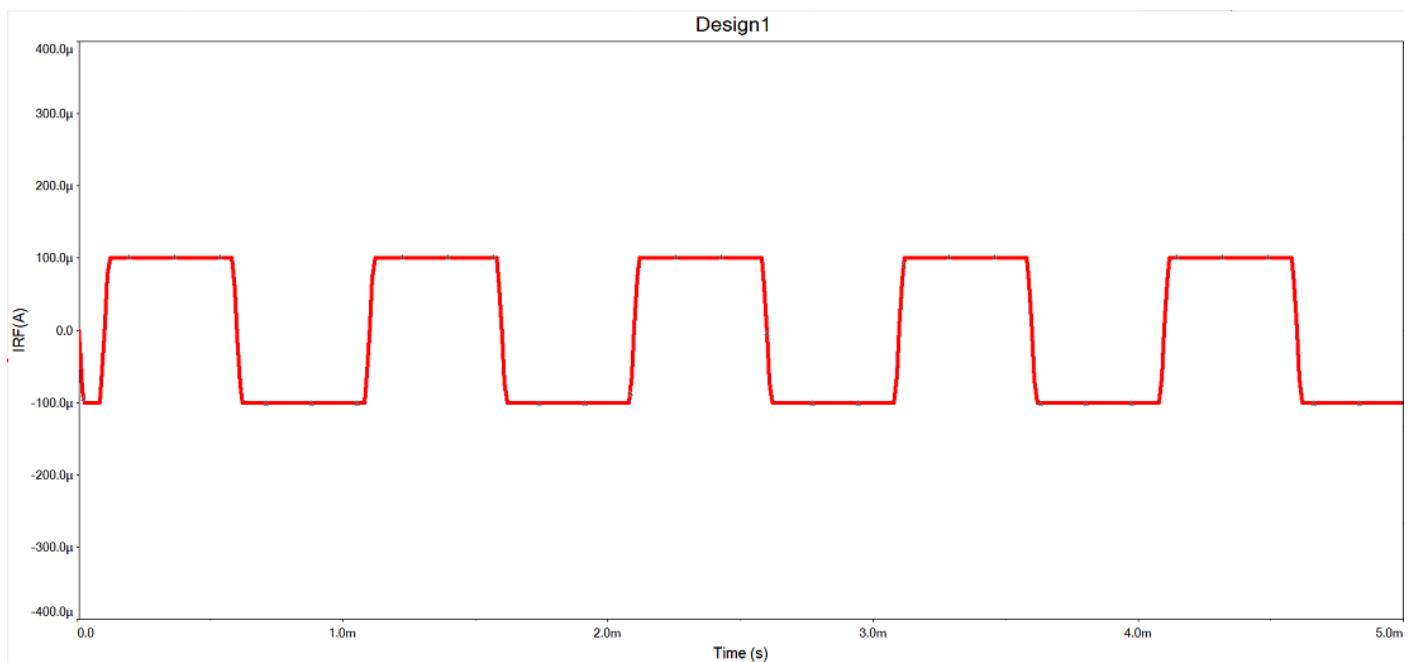
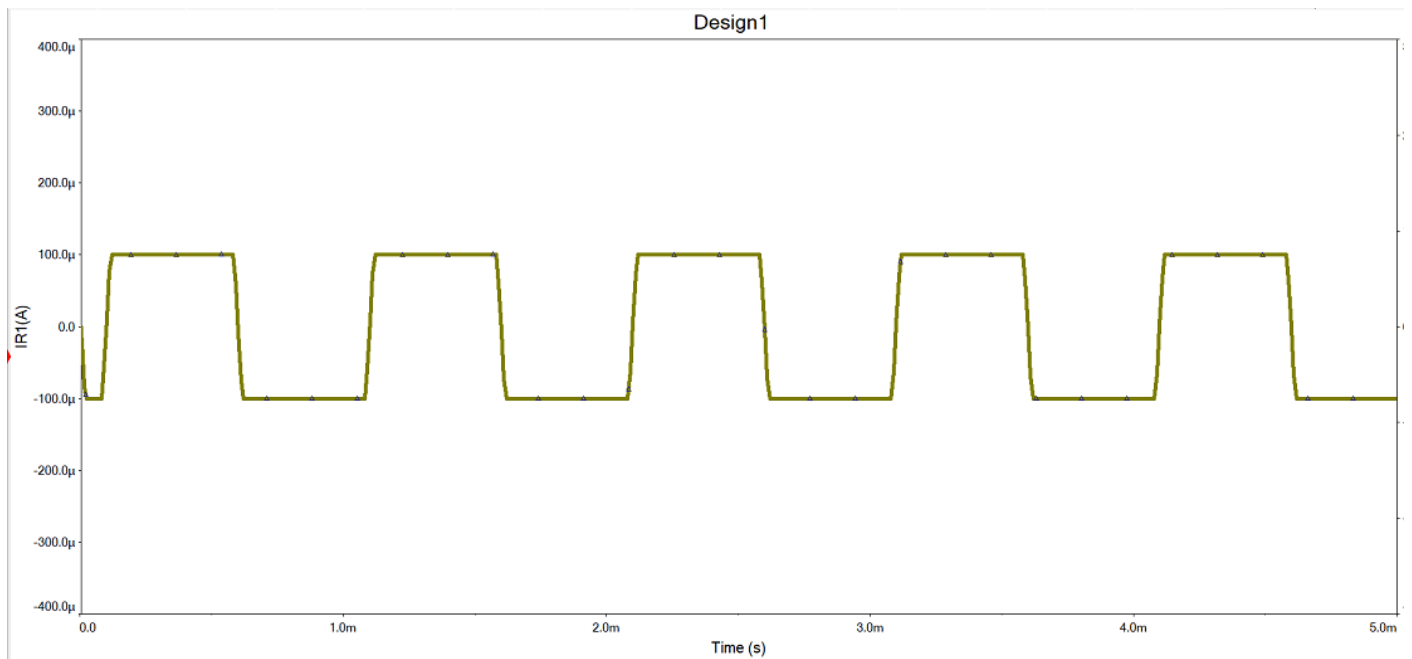
Same result as from Equations.

4)CRO snapshot displaying the voltage of negative and positive terminals of the Op-Amp:



Comment: Ideally, they should be the same as we assume that the differential voltage between the two terminals is equal to zero but practically there is a small differential voltage which causes this difference in the snapshot

5)CRO snapshot displaying current waveforms in the resistors R1 and Rf and then calculate and compare the simulation results to the theoretical values:



Both are the same as there is no current passes inside the Op-amp

Calculate the current:e

$$IR1=IRF=(V_{(+)}-0)/R1=(1-0)V/10Kohm=100microA$$

The same result