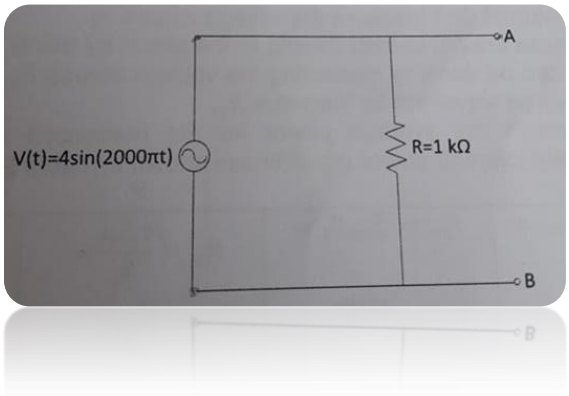
❖ Introduction

1. **We Studying the basic properties of the alternating current (AC) .**
2. **We learned how to use the oscilloscope ,In the first circuit we used it to measure the voltage , in the second we use it to measure the current.**
3. **The basic parameters of AC waveform that we studied in this experiment are the peak amplitude , frequency and period.**

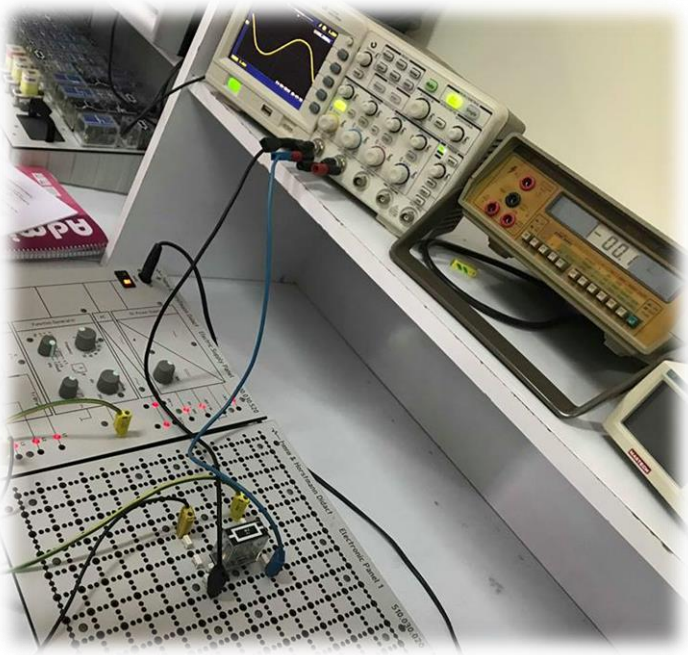
❖ Procedure

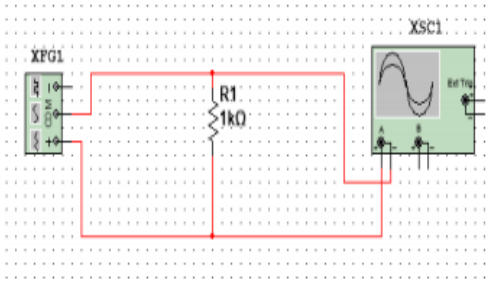
✓ Part one (using oscilloscope to measure the voltage)

1. **We connect the circuit as shown.**

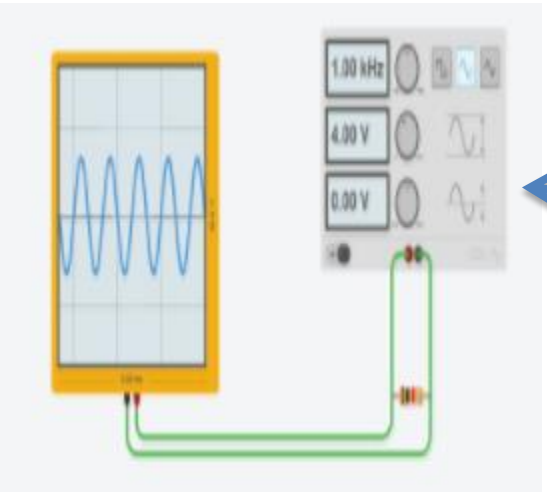


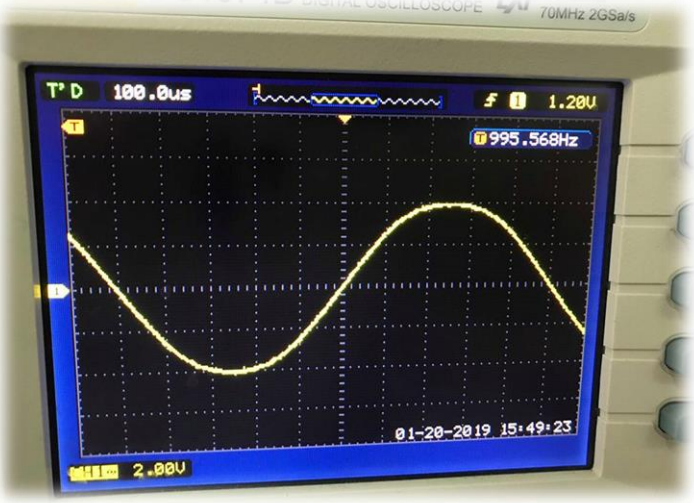
2. **We connect channel one of the oscilloscope to point A, adjust the voltage and time scales of the oscilloscope to display one cycle of sinusoidal waveform.**





✓ **From the screen that show the signal we can determine the basic parameters of AC waveform.(see Table 1)**



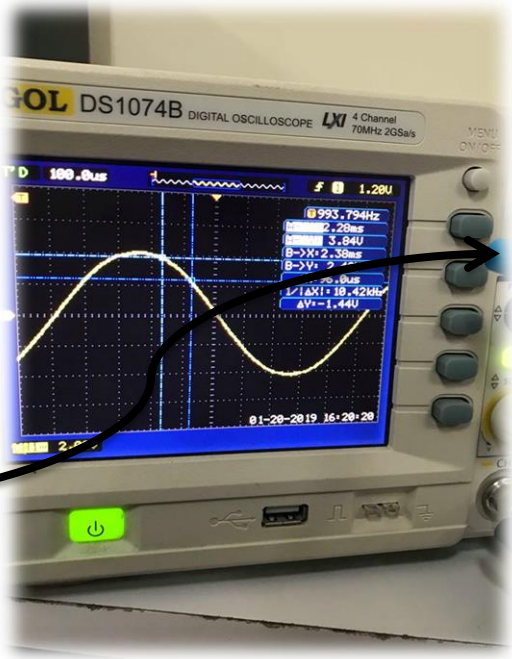


Vp=3.92volt	Vpp=8volt	Ip=Vp\R=0.00392A	Vrms=2.77 volt
I rms=2.77*10^-3	T= 1 ms	ƒ=1000HZ	ω=6280 rad
ʎ=C\ ƒ =3*10^5	V(t=T\ 3)=3.82 volt*		

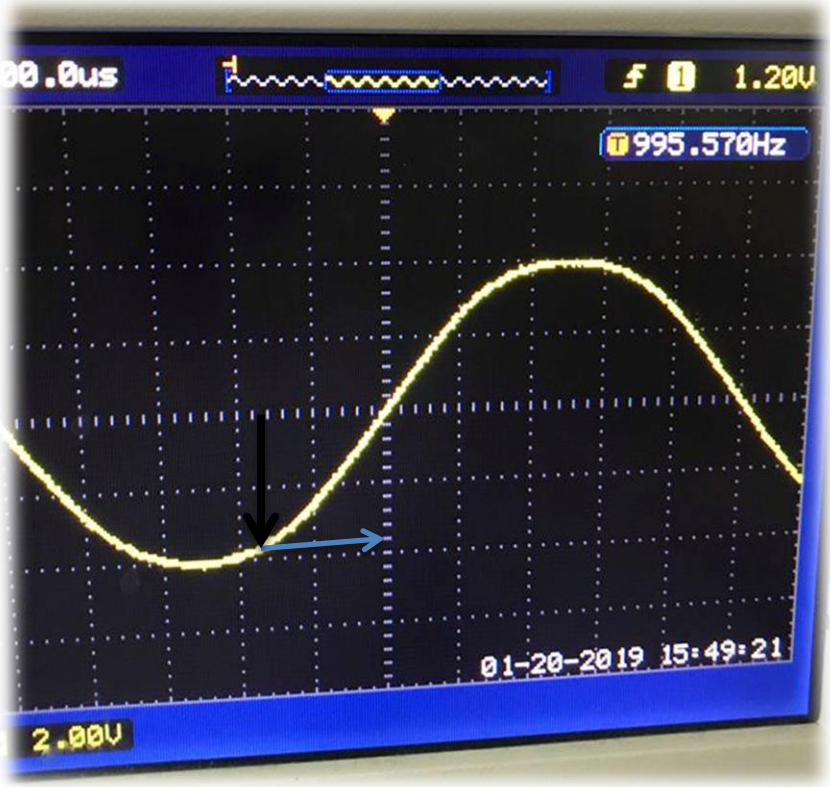
Table 1

*** Notice that we can calculated the instantaneous voltage by using two method.**

- **Firstly, by measuring (Cursor),we select cursor button and demonstrated the Indicator at one third of period and read the value.**



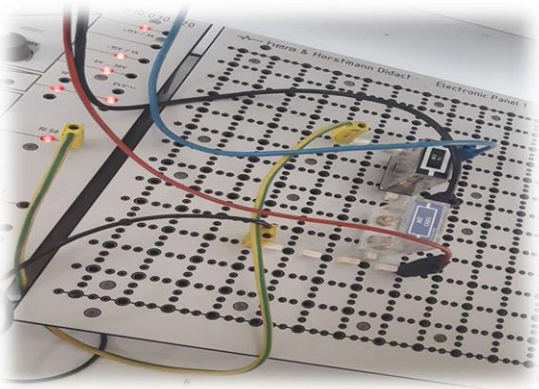
- **Secondly, by calculation. We identified one-third of the period and then we read the value in the y-axis.(The default Fig explain the process).**

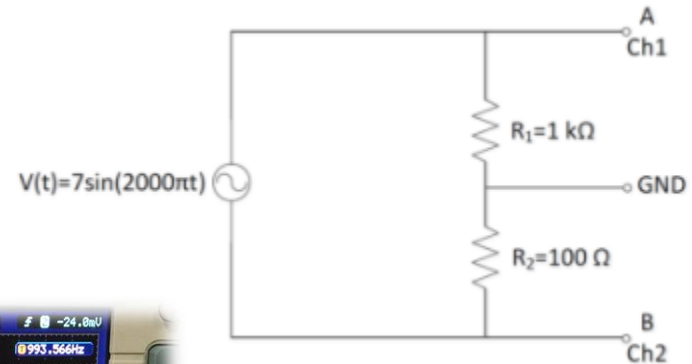


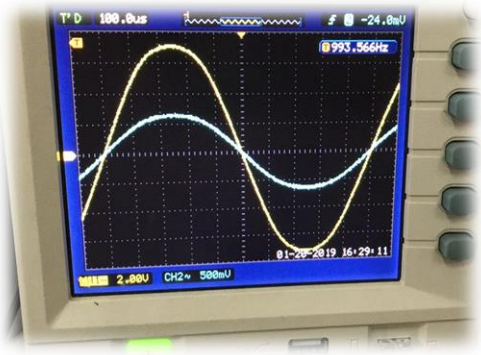
- We find that the x-axis consist of 10 square(T) so 1\3 period=10\3=3.3
- Notice that each small line represent 0.2 volt
- From the Fig v=1.8*2=3.6 volt

✓ Part Two (using oscilloscope to measure the current)

1. **We connect the circuit as shown, on channel one we measure the voltage across R1 and channel two to measure V_{R2}**







2. **We determine the Avg power for the measured signals by using different power equations.**

   Vp(ch1) =7 volt

   V rms(ch1) =7\1.4=4.94 volt

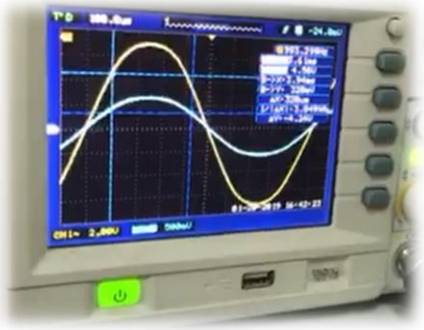
   V rms(Ch2)=600 mV\1.4=424.26 mV volt

   I rms=424.26 mV\100=0.00424 A

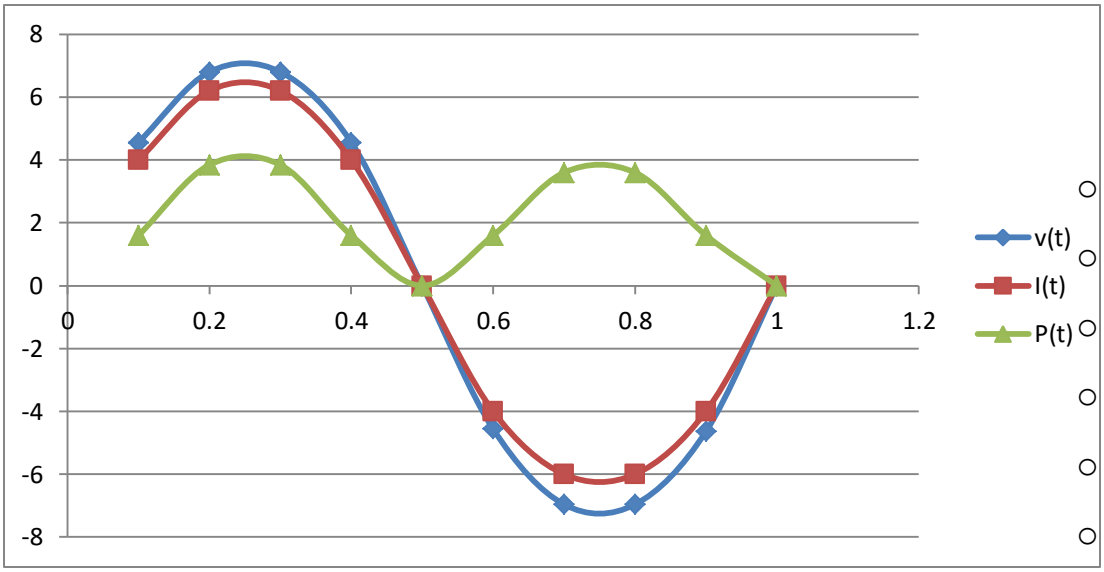
   Ip=600mV\100=0.006 A

P_{av} = Vrms*I rms =4.94*0.0042=0.021watt	**P_{av}=I^2 *R1 0.0042^2*1000= 0.0179 watt**	**P_{av}= v^2\R1 =0.0244 watt**	**Pav= 0.5*Vp*Ip = 0.006*7*0.5 =0.021 watt**

3. **We Compute the instantaneous power at different time instants.**



Time (ms)	Instantaneous Voltage (V)	Instantaneous Current (mA)		Instantaneous P (mW)
		V100Ω mV	I=v\100 mA	P= vi
0.1	4.56	400	4	1.6
0.2	6.8	620	6.2	3.844
0.3	6.8	620	6.2	3.844
0.4	4.56	400	4	1.6
0.5	0	0	0	0
0.6	-4.56	-400	-4	1.6
0.7	-6.96	-600	-6	3.6
0.8	-6.96	-600	-6	3.6
0.9	-4.64	-400	-4	1.6
1	0	0	0	0



- **The previous plots show the relationship between v,i and p with versus time**

❖ Conclusion

At this experiment we learned about AC Current & voltage .
We used Oscilloscope to measure the voltage and current by the signal which it gave , it give us the voltage signal , then we can find the current by Ohm Law. Moreover , we measured the Instantaneous voltage and current cross circuit , we plot the result on a graph , we can noticed that the power must be positive in any time .