7 BASIC QUESTIONS

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1) COMBING RESISTORS IN SERIES & PARALLEL

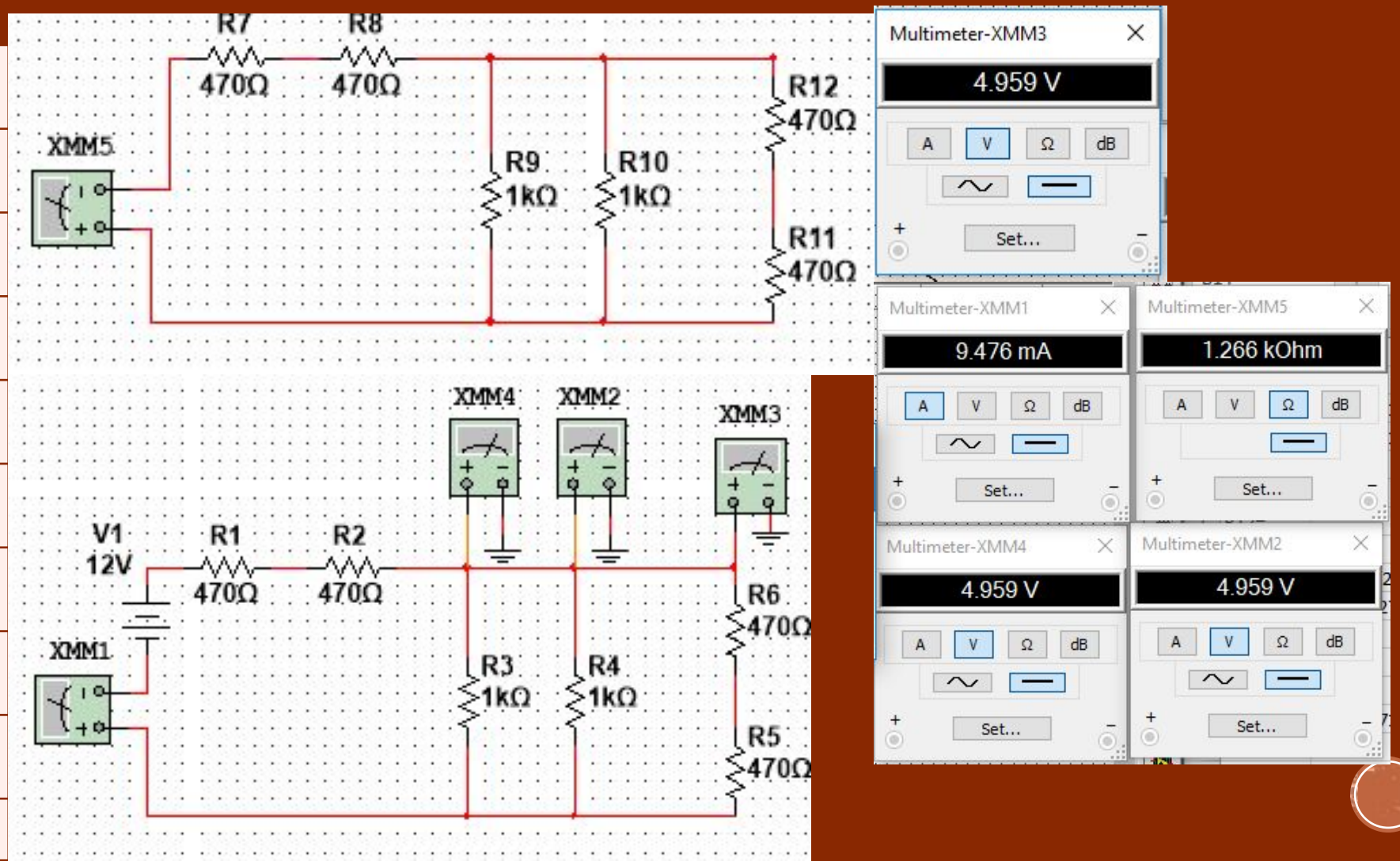
- Resistance in series is added together so if you have 4.7ohm, 2.2 ohm and 3.3 ohm resistors the total resistance would then be 4.7+2.2+3.3=10.2 ohms of resistance for the entire circuit

- Resistance in parallel can be calculated by dividing 1 by the sum of the inverse of each resistance so if you have the same three resistors it would look like this:

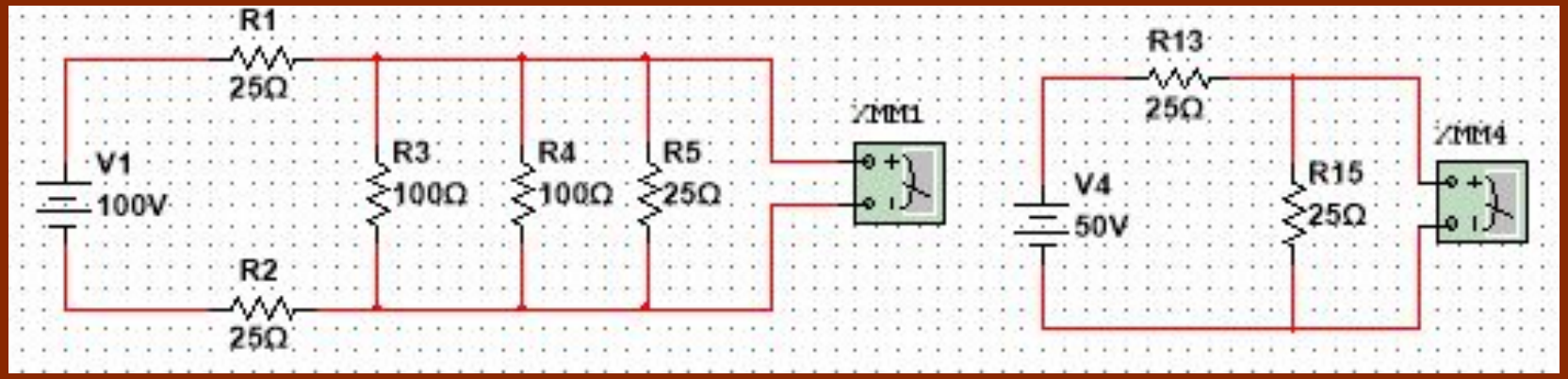
$$RT=\frac{1}{\frac{1}{4.7}+\frac{1}{2.2}+\frac{1}{3.3}}=1.01\text{ohm}$$

2) VALUES OF A CIRCUIT

R1=	470	Ω
R2=	470	Ω
R3=	1E+3	Ω
R4=	1E+3	Ω
R5=	470	Ω
R6=	470	Ω
R12=	940	Ω
R56=	940	Ω
R3456=	326.39	Ω
RT	1.27E+3	Ω



3) THEVENIN'S RESISTANCE



- Used to simplify circuits by removing the load resistors and measuring resistance where that resistor would be, then shorting out the power to measure the resistance. Then using those values to create a new circuit.

4) COMBINING CAPACITORS IN SERIES & PARALLEL

- To combine capacitors in series you divide 1 by the inverse of each capacitors in the series.
- To combine capacitors in parallel each branch of capacitance must be summed together
- Each of these exampled in the table
- Capacitance works a lot like resistance but it works vise versa for series and parallel so B4 show product over sum which can also be used for resistance.

	A	B
1	series	
2	C1=	0.00001
3	C2=	0.000022
4	C12=	=(B2*B3)/(B2+B3)
5	C3=	0.000047
6	CT=	=1/((1/B2)+(1/B3)+(1/B5))
7		=(B5*B4)/(B5+B4)
8		
9	parallel	
10	C1=	0.00001
11	C2=	0.000022
12	C3=	0.000047
13	CT=	=SUM(B10:B12)
14		0.000079

5) COMBINING INDUCTORS IN SERIES & PARALLEL

- When combining inductors are done exactly the same as resistors within calculations as shown in the figures and is represented by Lt.
- During simulation the single frequency and equation must be used to obtain the total inductance which depends on the frequency.

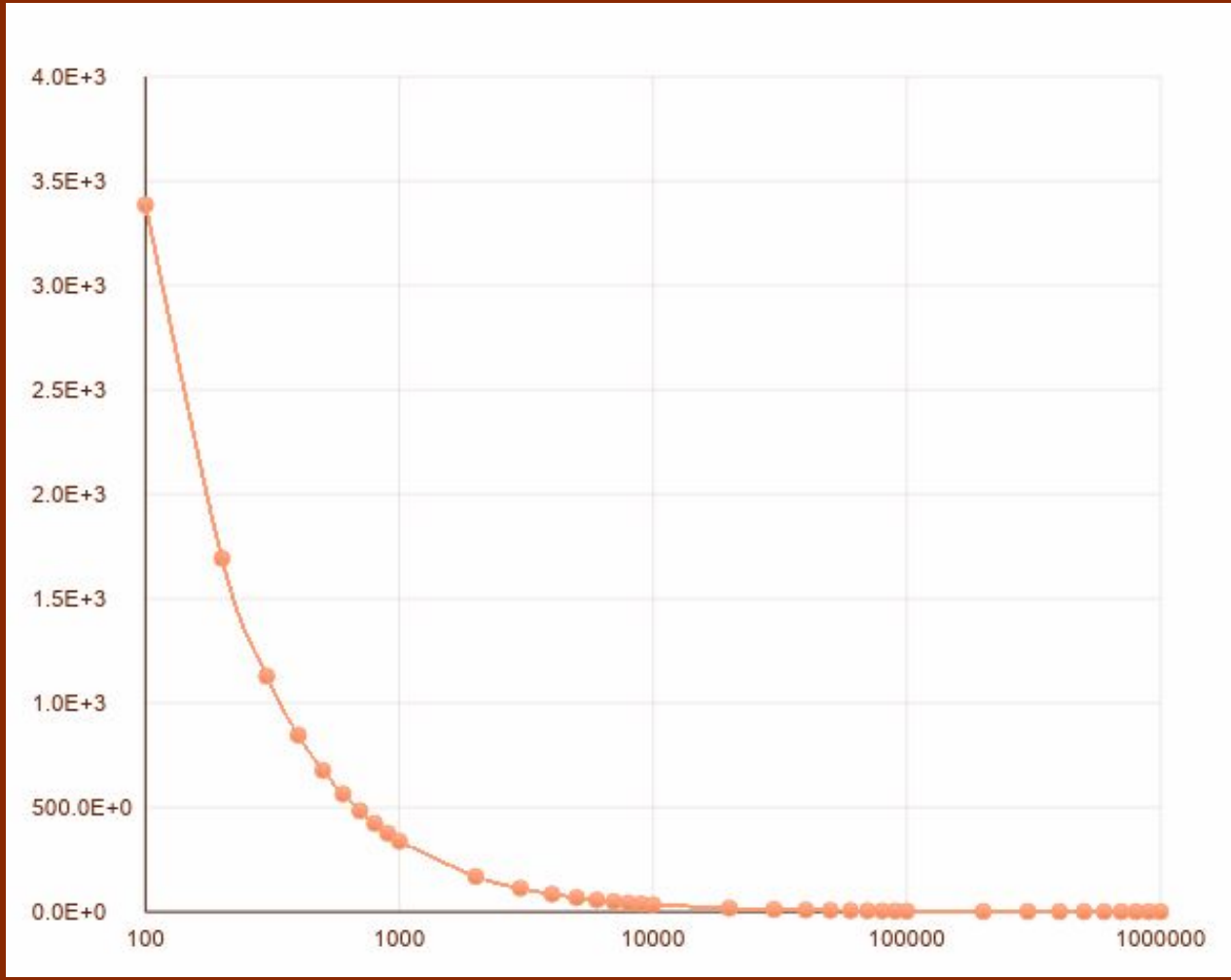
$$L_T = \frac{1}{\frac{1}{L_1} + \frac{1}{L_2} + \frac{1}{L_3} \cdots + \frac{1}{L_n}}$$

Parallel Circuits

$$L_T = \frac{L_1 \times L_2}{L_1 + L_2}$$

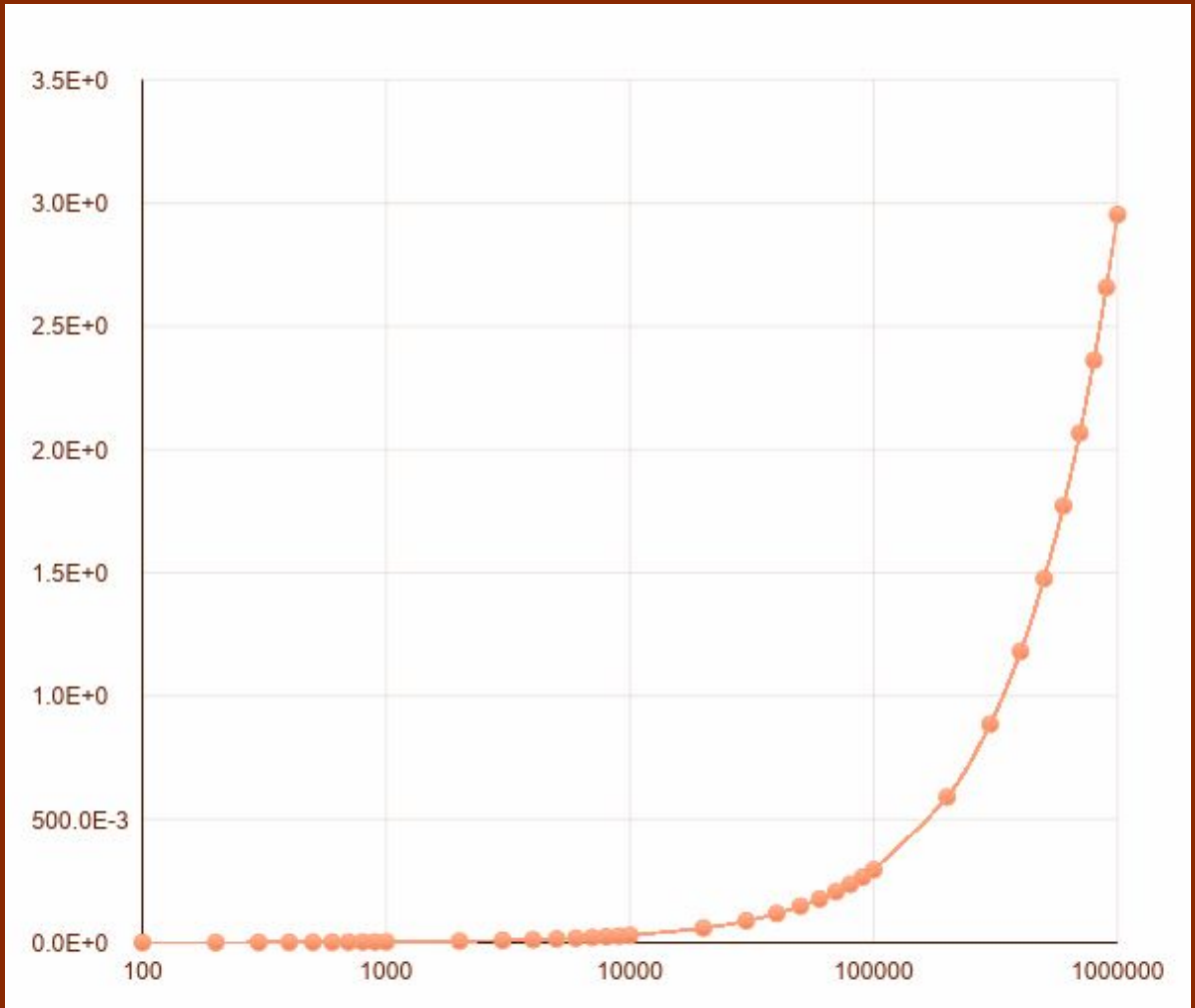
$$L_T = L_1 + L_2 + \ldots L_n$$

6) RC CIRCUIT



C =	470.0E-9	8.0E+3	42.33
f	Xc	9.0E+3	37.63
100	3.4E+3	10.0E+3	33.86
200	1.7E+3	20.0E+3	16.93
300	1.1E+3	30.0E+3	11.29
400	846.57	40.0E+3	8.47
500	677.26	50.0E+3	6.77
600	564.38	60.0E+3	5.64
700	483.75	70.0E+3	4.84
800	423.28	80.0E+3	4.23
900	376.25	90.0E+3	3.76
1.0E+3	338.63	100.0E+3	3.39
2.0E+3	169.31	200.0E+3	1.69
3.0E+3	112.88	300.0E+3	1.13
4.0E+3	84.66	400.0E+3	846.6E-3
5.0E+3	67.73	500.0E+3	677.3E-3
6.0E+3	56.44	600.0E+3	564.4E-3
7.0E+3	48.38	700.0E+3	483.8E-3
		800.0E+3	423.3E-3
		900.0E+3	376.3E-3
		1.0E+6	338.6E-3

7) RL CIRCUIT



L=	470.0E-9
f	Xl
100	295.3E-6
200	590.6E-6
300	885.9E-6
400	1.2E-3
500	1.5E-3
600	1.8E-3
700	2.1E-3
800	2.4E-3
900	2.7E-3
1.0E+3	3.0E-3
2.0E+3	5.9E-3
3.0E+3	8.9E-3
4.0E+3	11.8E-3
5.0E+3	14.8E-3
6.0E+3	17.7E-3
7.0E+3	20.7E-3
8.0E+3	23.6E-3
9.0E+3	26.6E-3
10.0E+3	29.5E-3
20.0E+3	59.1E-3
30.0E+3	88.6E-3
40.0E+3	118.1E-3
50.0E+3	147.7E-3
60.0E+3	177.2E-3
70.0E+3	206.7E-3
80.0E+3	236.2E-3
90.0E+3	265.8E-3
100.0E+3	295.3E-3
200.0E+3	590.6E-3
300.0E+3	885.9E-3
400.0E+3	1.2E+0
500.0E+3	1.5E+0
600.0E+3	1.8E+0
700.0E+3	2.1E+0
800.0E+3	2.4E+0
900.0E+3	2.7E+0
1.0E+6	3.0E+0