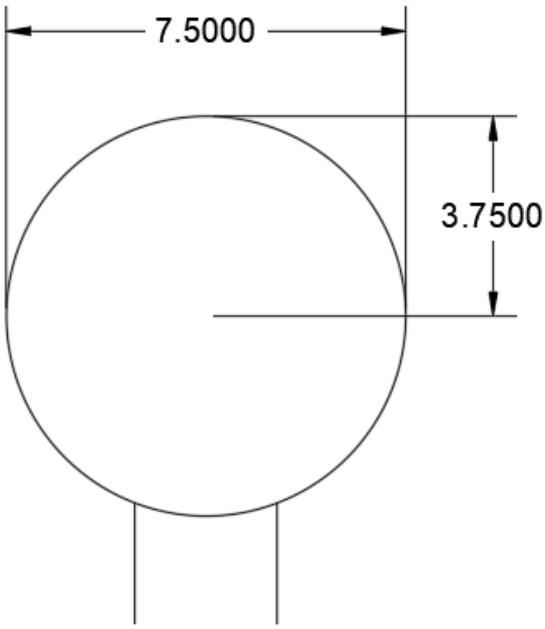
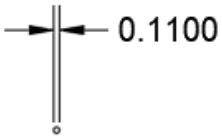
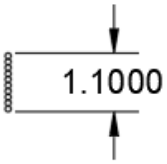


COIL RADIUS AND DIAMETER (CM)



WIRE DIAMETER (CM)



COIL CROSS SECTION (CM)

$$L_{coil} \approx N^2 \mu_0 \mu_r \left(\frac{D}{2}\right) \left[ln\left(\frac{8D}{d}\right) - 2\right]$$

Where:

L_{coil} = inductance of the coil in henries (H)

N^2 = number of turns

μ_0 = permeability of free space = $4\pi \times 10^{-7}$

μ_r = relative permeability

D = loop diameter

d = wire diameter

```
Final Inductance =
50.469 uH
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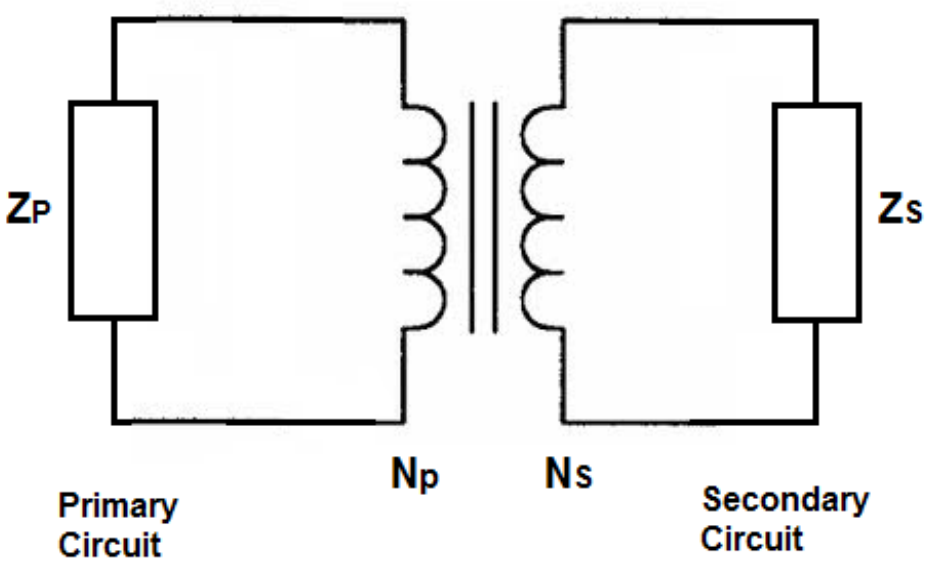
Frequency(Hz)	Inductive Reactance (Ohms)	Angular Freq (rad/s)
1	0.00031711	6.283
10	0.003171	62.832
100	0.03171061	628.319
1000	0.31710608	6283.185
10000	3.17106	62831.853
100000	31.71061	628318.531
1000000	317.10608	6.283 × 10+6
10000000	3171.06	6.283 × 10+7



Impedance Matching Formula

$$\frac{\text{Primary Turns}}{\text{Secondary Turns}} = \sqrt{\frac{\text{Primary Impedance}}{\text{Secondary Impedance}}}$$

$$\frac{N_P}{N_S} = \sqrt{\frac{Z_P}{Z_S}}$$

Frequency(Hz)	Turn Ratio	Secondary Turns, Ns (Assuming 10 primary turns)
1	397.082 : 1	0.025
10	125.57 : 1	0.079
100	39.709 : 1	0.251
1000	12.557 : 1	1
10000	3.971 : 1	3
100000	1.256 : 1	8
1000000	1 : 2.518	25
10000000	1 : 7.964	80