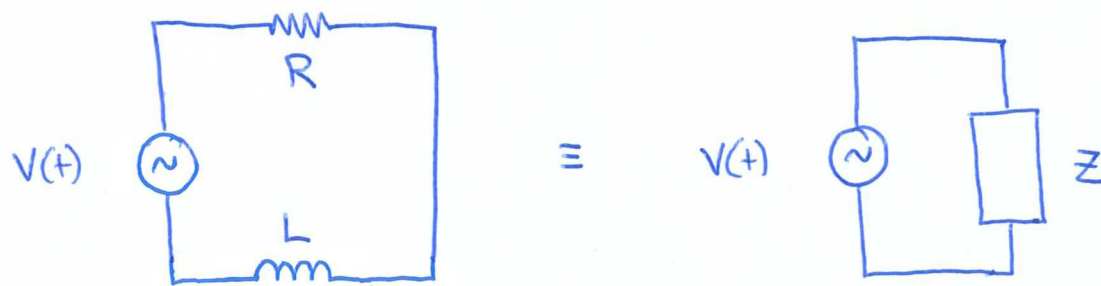


RL Steady State



Phasor Ohm's Law:

$$\tilde{V} = Z \tilde{I} \quad \text{where} \quad Z = R + iX \quad \text{and} \quad X = \omega L$$

Current Magnitude:

$$I_p = \frac{1}{|Z|} \quad \text{where} \quad |Z| = \sqrt{R^2 + X^2}$$

Current Phase Shift:

$$\phi_I = -\phi_Z \quad \text{where} \quad \phi_Z = \tan^{-1}\left(\frac{X}{R}\right)$$

Resonance:

$$X = 0 = \omega L$$

A curved arrow points from the equation $X = 0 = \omega L$ to a rectangular box containing the equation $\omega_0 = 0$.

R series L series C Steady State Numerical Solution

Variables
R 50 ohm
L 0.1 Henry = ohm s

Voltage Source
phi_V 0 degrees

Resonance
omega_o = 0.0 rads/s
freq_o = 0.0 Hz

Steady-State Solution

omega order	omega [rads/s]	frequency [Hz]	X [ohms]	Z [ohms]	phi_Z [rads]	I_p [amps]	I_p [dB]	phi_I [degrees]
0.0000	1.0000	0.15915	0.1000	50.0001	0.00200	0.020000	-33.979	-0.115
0.0100	1.0233	0.16286	0.1023	50.0001	0.00205	0.020000	-33.979	-0.117
0.0200	1.0471	0.16666	0.1047	50.0001	0.00209	0.020000	-33.979	-0.120
0.0300	1.0715	0.17054	0.1072	50.0001	0.00214	0.020000	-33.979	-0.123
0.0400	1.0965	0.17451	0.1096	50.0001	0.00219	0.020000	-33.979	-0.126
0.0500	1.1220	0.17857	0.1122	50.0001	0.00224	0.020000	-33.979	-0.129
0.0600	1.1482	0.18273	0.1148	50.0001	0.00230	0.020000	-33.979	-0.132
0.0700	1.1749	0.18699	0.1175	50.0001	0.00235	0.020000	-33.979	-0.135
0.0800	1.2023	0.19135	0.1202	50.0001	0.00240	0.020000	-33.979	-0.138
0.0900	1.2303	0.19580	0.1230	50.0002	0.00246	0.020000	-33.979	-0.141
0.1000	1.2589	0.20036	0.1259	50.0002	0.00252	0.020000	-33.979	-0.144
0.1100	1.2882	0.20503	0.1288	50.0002	0.00258	0.020000	-33.979	-0.148
0.1200	1.3183	0.20981	0.1318	50.0002	0.00264	0.020000	-33.979	-0.151
0.1300	1.3490	0.21469	0.1349	50.0002	0.00270	0.020000	-33.979	-0.155
0.1400	1.3804	0.21969	0.1380	50.0002	0.00276	0.020000	-33.979	-0.158
0.1500	1.4125	0.22481	0.1413	50.0002	0.00283	0.020000	-33.979	-0.162
0.1600	1.4454	0.23005	0.1445	50.0002	0.00289	0.020000	-33.979	-0.166
0.1700	1.4791	0.23541	0.1479	50.0002	0.00296	0.020000	-33.979	-0.169
0.1800	1.5136	0.24089	0.1514	50.0002	0.00303	0.020000	-33.979	-0.173
0.1900	1.5488	0.24650	0.1549	50.0002	0.00310	0.020000	-33.979	-0.177
0.2000	1.5849	0.25224	0.1585	50.0003	0.00317	0.020000	-33.979	-0.182
0.2100	1.6218	0.25812	0.1622	50.0003	0.00324	0.020000	-33.979	-0.186
0.2200	1.6596	0.26413	0.1660	50.0003	0.00332	0.020000	-33.979	-0.190
0.2300	1.6982	0.27028	0.1698	50.0003	0.00340	0.020000	-33.979	-0.195
0.2400	1.7378	0.27658	0.1738	50.0003	0.00348	0.020000	-33.979	-0.199
0.2500	1.7783	0.28302	0.1778	50.0003	0.00356	0.020000	-33.979	-0.204
0.2600	1.8197	0.28961	0.1820	50.0003	0.00364	0.020000	-33.979	-0.209
0.2700	1.8621	0.29636	0.1862	50.0003	0.00372	0.020000	-33.979	-0.213
0.2800	1.9055	0.30326	0.1905	50.0004	0.00381	0.020000	-33.979	-0.218
0.2900	1.9498	0.31033	0.1950	50.0004	0.00390	0.020000	-33.979	-0.223
0.3000	1.9953	0.31756	0.1995	50.0004	0.00399	0.020000	-33.979	-0.229
0.3100	2.0417	0.32495	0.2042	50.0004	0.00408	0.020000	-33.979	-0.234
0.3200	2.0893	0.33252	0.2089	50.0004	0.00418	0.020000	-33.979	-0.239
0.3300	2.1380	0.34027	0.2138	50.0005	0.00428	0.020000	-33.979	-0.245
0.3400	2.1878	0.34819	0.2188	50.0005	0.00438	0.020000	-33.979	-0.251
0.3500	2.2387	0.35630	0.2239	50.0005	0.00448	0.020000	-33.979	-0.257
0.3600	2.2909	0.36460	0.2291	50.0005	0.00458	0.020000	-33.979	-0.263
0.3700	2.3442	0.37310	0.2344	50.0005	0.00469	0.020000	-33.979	-0.269
0.3800	2.3988	0.38179	0.2399	50.0006	0.00480	0.020000	-33.980	-0.275
0.3900	2.4547	0.39068	0.2455	50.0006	0.00491	0.020000	-33.980	-0.281
0.4000	2.5119	0.39978	0.2512	50.0006	0.00502	0.020000	-33.980	-0.288
0.4100	2.5704	0.40909	0.2570	50.0007	0.00514	0.020000	-33.980	-0.295
0.4200	2.6303	0.41862	0.2630	50.0007	0.00526	0.020000	-33.980	-0.301
0.4300	2.6915	0.42837	0.2692	50.0007	0.00538	0.020000	-33.980	-0.308
0.4400	2.7542	0.43835	0.2754	50.0008	0.00551	0.020000	-33.980	-0.316
0.4500	2.8184	0.44856	0.2818	50.0008	0.00564	0.020000	-33.980	-0.323

dB = 20 log(I_p)

