

$$\begin{aligned}E &= 10 \text{ V}_p \\R &= 560 \text{ m}\Omega \\C &= 100 \text{ nF} \\L &= 220 \text{ }\mu\text{H}\end{aligned}$$

53. What is the resonant frequency of this circuit?

33.9 kHz

54. What is the bandwidth?

405 Hz

55. What is the quality factor?

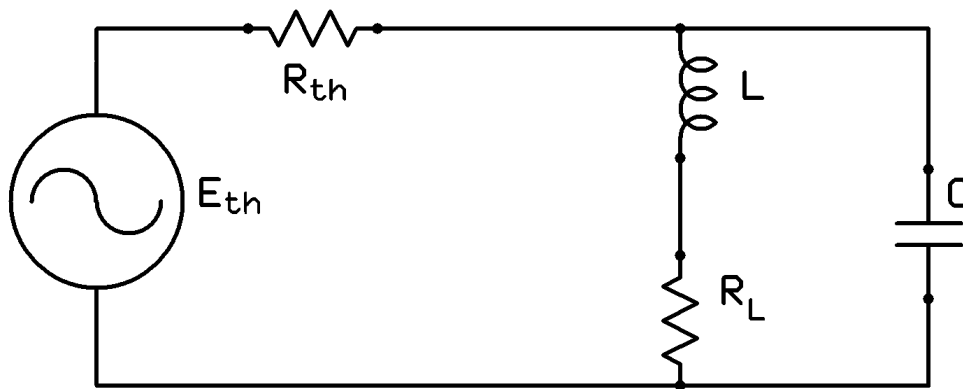
83.7

56. At resonance, what is the current?

17.9 A_p

57. At resonance, what is V_C ?

837 V_P



$$\begin{aligned}E_{th} &= 5 \text{ V}_p \\R_{th} &= 200 \, \Omega \\R_L &= 10 \, \Omega \\C &= 820 \text{ pF} \\L &= 500 \, \mu\text{H}\end{aligned}$$

58. What is f_s for this circuit?

248.558 kHz

59. What is f_p for this circuit?

248.537 kHz

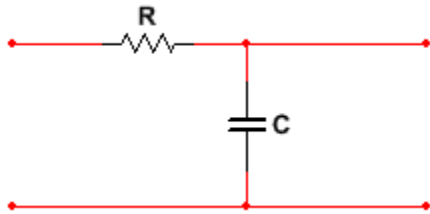
60. What is bandwidth of this circuit?

973.903 kHz

61. What is the total parallel impedance seen by the source?

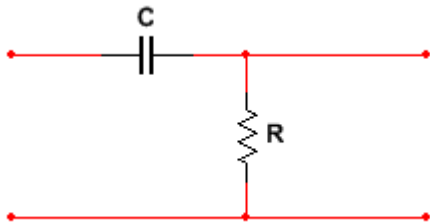
199.3 Ω

62. For voltage, a gain factor of 10 is equal to:
- a. 10 dB
 - b. 2 dB
 - c. 6 dB
 - d. **20 dB**
63. For voltage, a gain of 6 dB is equal to a gain of:
- a. 10
 - b. **2**
 - c. 20
 - d. 0.5
64. A system with a gain of 8 dB has 500 mV_p fed into it. What is the output voltage?
- a. 9.03 V_p
 - b. 4.05 V_p
 - c. 3.16 V_p
 - d. **1.26 V_p**
65. A circuit has an input of 2 V_{rms}, and an output of 220 V_{rms}. What is the gain?
- a. 20.4 dB
 - b. **40.8 dB**
 - c. 46.8 dB
 - d. 110 dB
66. A circuit outputs 3.5 W with an input power of 1.2 W. What is the gain of the system?
- a. 9.3 dB
 - b. 5.44 dB
 - c. -4.64 dB
 - d. **4.64 dB**
67. A system with a gain of 44 dB is fed 820 μW. What is the output power?
- a. 85 mW
 - b. 85 W
 - c. 130 mW
 - d. **20.6 W**



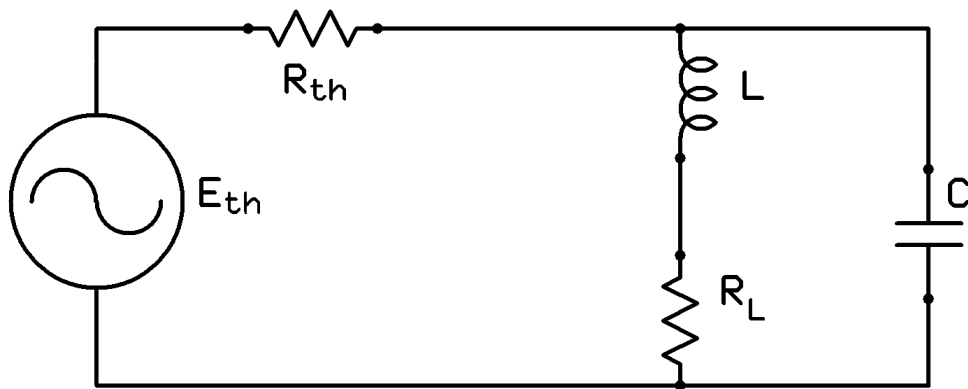
$$R = 100 \, \Omega$$
$$C = 220 \, \text{nF}$$

68. What is the break frequency of this filter?
- a. 0.722 Hz
 - b. **7.23 kHz**
 - c. 7.23 Hz
 - d. 10.7 Hz
69. For the above filter, what is the gain at $10f_c$?
- a. -3 dB
 - b. -6 dB
 - c. -10 dB
 - d. **-20 dB**



$$R = 470 \, \Omega$$
$$C = 47 \, \text{nF}$$

70. What is the cut-off frequency of this filter?
- a. 720 Hz
 - b. 1.1 Hz
 - c. 33.9 Hz
 - d. **7.2 kHz**
71. What is the gain at $10f_c$?
- a. -6 dB
 - b. -20 dB
 - c. **-0.8 dB**
 - d. -3 dB



$$\begin{aligned}E_{th} &= 2.5 \text{ V}_p \\R_{th} &= 150 \, \Omega \\R_L &= 30 \, \Omega \\C &= 47 \text{ pF} \\L &= 2.2 \text{ mH}\end{aligned}$$

72. For the above circuit, what is the center frequency?

494.948 kHz

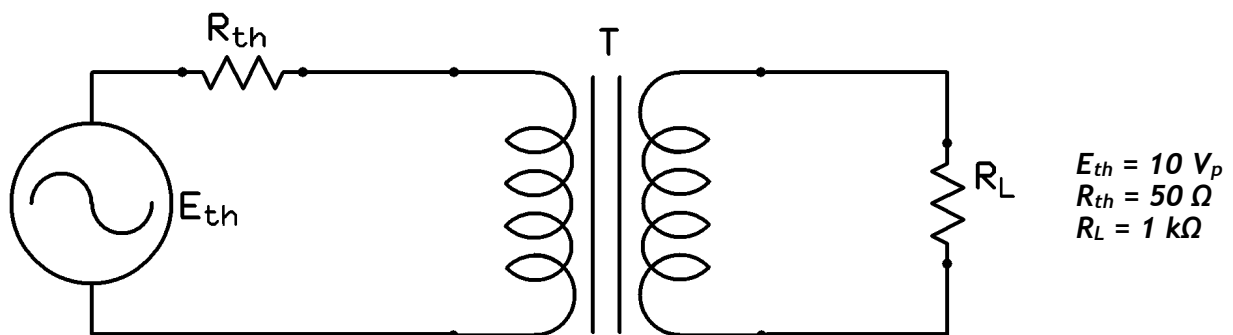
73. For the above circuit, what is the bandwidth?

22.572 MHz

74. Which is better?

- a. **Waffles**
- b. Pancakes

75. An ideal transformer has an input voltage of $120\text{ V}_{\text{rms}}$. The output voltage is 19 V_{rms} . What is the turns ratio?
- 6.316**
 - 0.1583
 - 12
 - 19
76. An ideal transformer with a turns ratio of 8:1 has a primary current of $150\text{ mA}_{\text{rms}}$. What is the secondary current?
- 18.75 mA_{rms}
 - 2.34 mA_{rms}
 - 1200 mA_{rms}**
 - 9600 mA_{rms}
77. An iron-core transformer has a primary inductance of 200 mH and a secondary inductance of 600 mH. What is the mutual inductance?
- 120 H
 - 3 mH
 - 346 mH**
 - 333 μH



78. For the circuit above, what turns ratio should be used for the transformer to achieve maximum power transfer to the load, assuming an ideal transformer?

$$a = \sqrt{\frac{1000}{50}} = 4.472$$

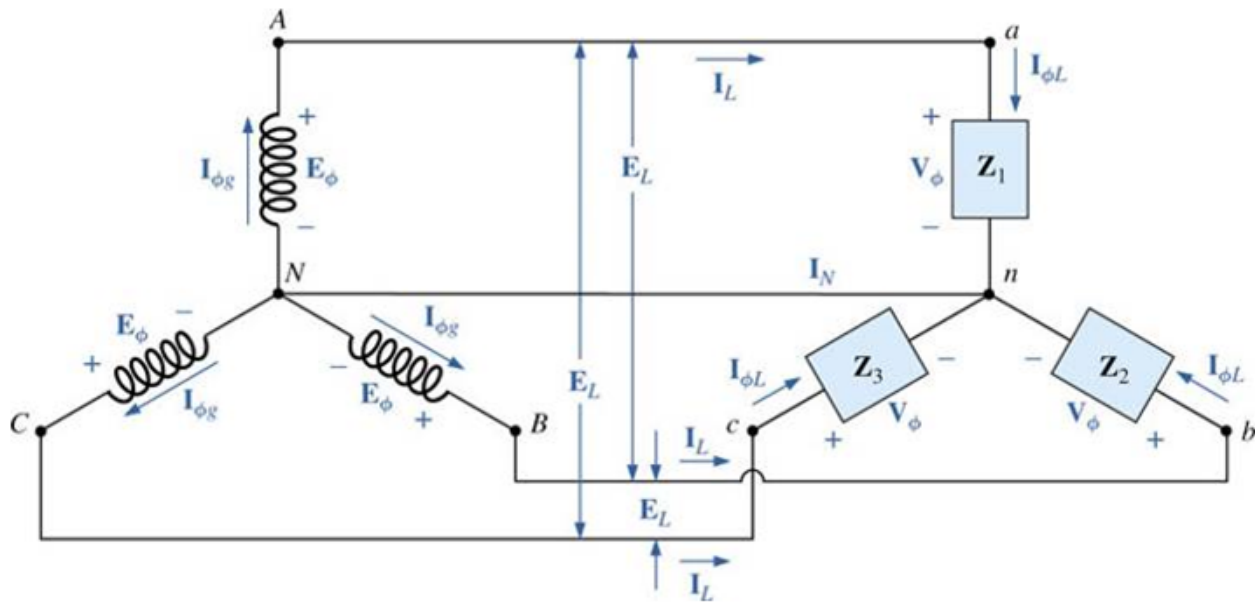


Image used courtesy of the textbook, *Introductory Circuit Analysis, 13th Edition, Robert L. Boylestad*.

79. The Y-connected generator has a phase voltage of 240 V_{rms}. If each load is 10 Ω, calculate the following:
- Phase voltage of the load
240 V_{rms}
 - Line voltage
416 V_{rms}
 - Line current
24 A_{rms}

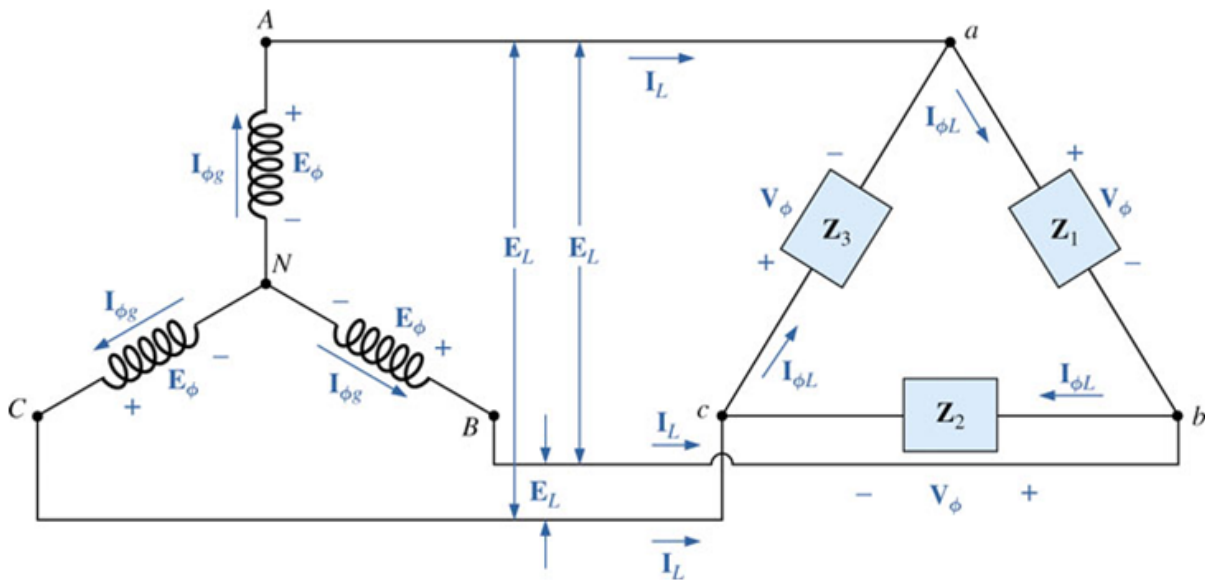


Image used courtesy of the textbook, *Introductory Circuit Analysis, 13th Edition, Robert L. Boylestad*.

80. The Y-connected generator has a phase voltage of 240 Vrms. If each load is 10Ω , calculate the following:

a. Phase voltage of the load

$$416 \text{ V}_{\text{rms}}$$

b. Line voltage

$$416 \text{ V}_{\text{rms}}$$

c. Line current

$$41.6 \text{ A}_{\text{rms}}$$

Changelog:

1. Changed component values on page 1 to make the results more reasonable.
2. Updated answers to #64 to include the actual correct answer
3. Updated answers to #67 to include the actual correct answer
4. Updated answers to #68 to include the actual correct answer