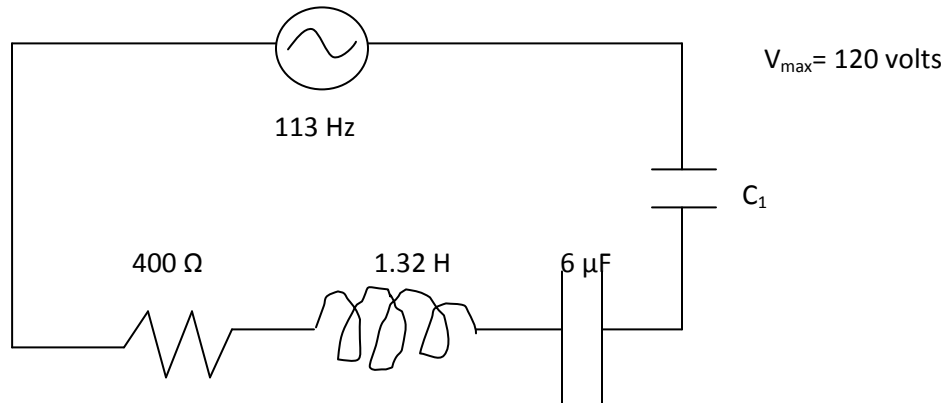
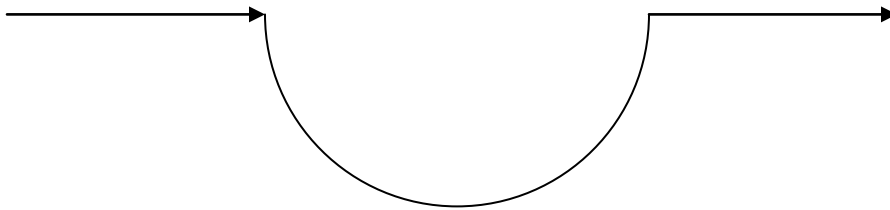


1. An atom of chlorine with an extra electron (17 protons, 18 neutrons, 18 electrons) is moving north at .072 m/s. What is the strength and direction of the magnetic field it is moving through if the atom stays at a constant distance above the earth's surface?
- 2.



- 1) What is the value of C_1 which allows the maximum current in the circuit?
- 2) What is that max current?
- 3) What would be the average power using that current?
3. An open LR circuit has an EMF of 3 mV, a resistor of $4.4 \text{ m}\Omega$, and an air core solenoid with 350 turns, a 35 cm length, and a 5 cm^2 cross-sectional area. How long after the circuit closes does the current reach 0.6 amps?
4. A capacitor has its parallel plates separated by a distance of 0.25 cm. The magnitude of the electric field between the plates is 3600 N/C when $6.75 \text{ }\mu\text{C}$ of charge accumulate on the plates. Find the capacitance.
5. A current carrying wire is bent in such a way that it has a semicircular portion 5.8 cm in diameter. 3 mA of current runs through the wire as shown below. Find the magnetic field at the center of the semicircle.



6. A screen has a double slit separated 0.05 mm. The distance between the central bright fringe and the first dark fringe is 5 cm. Find the wavelength of the light. The distance between the source and screen is 1.5 meters.
7. An electron microscope accelerates electrons to $5 \times 10^6 \text{ m/s}$. Find the limiting angle if the effective diameter of the aperture is 1mm.
8. Describe Maxwell's laws.