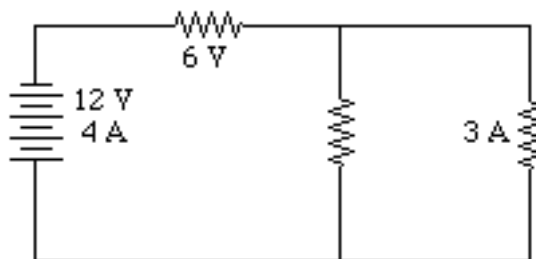


PHYSICS 12 CIRCUITRY WORKSHEET 4

1. What is the power consumption of a household heater that draws a current of 9 A when connected to a 120 V line?
2. A 75 W light bulb is used in a lamp connected to a 120 V power source.
 - a) What current flows through the bulb?
 - b) What is the resistance of the bulb under these conditions?
3. A small heating coil has a resistance of 20 Ω .
 - a) Assuming R is constant, what would an ammeter in the circuit read if the applied p.d. is 100 V?
 - b) How much heat will be generated in R in 100 s?
4. An electric iron of resistance 20 Ω takes a current of 5.0 A. Calculate the heat energy developed in 30 s.
5. A household appliance was inadvertently left on for an entire week while a family was away on vacation. A steady current of 5.0 A was drawn from the 120 V line. The cost of electricity in the area is 5 cents per kWh.
 - a) How much power is needed by the appliance?
 - b) How much energy (in Joules) was used?
 - c) How much did it cost to run the appliance?
6. A well-groomed physics student blows his hair dry every morning using a 1200 W hair dryer. On average, it takes him 5 minutes each time he uses it. The cost of electricity in his area is 5 cents per kWh. What is the annual cost for running the hair dryer?
7. A 20 V lamp designed to dissipate 80 W is placed in series with a resistor **R** and a 60 V dc source. What value should **R** be for the lamp to operate properly?
8. A 25 W, 120 V bulb has a cold resistance of 45 Ω and a hot resistance of 575 Ω . When the voltage is switched on,
 - a) what is the instantaneous current?
 - b) what is the current after a few minutes of normal operation?
9. A light bulb is designed for use in a 120 V circuit. If by mistake it is plugged into a 240 V circuit,
 - a) what will happen to the current through it?
 - b) what will happen to the power of the light bulb? Explain.

10. For the diagram to the right, determine the power consumed in each resistor.



1. 1.08×10^3 W
2. a) 0.625 A b) 192 Ω
3. a) 5 A b) 5.0×10^4 J
4. 1.5×10^4 J
5. a) 600 W b) 3.63×10^8 J
- c) \$5.00
6. \$1.83
7. 10 Ω
8. a) 2.67 A b) 0.209 A
9. a) doubles b) quadruples
10. 24 W, 6 W, 18 W