**How much gasoline would it take to charge an iPhone?**

**Strategy:**

What you really want to know is how does the total energy in an iPhone battery compare to the energy in gasoline. Fill in the blanks below either with information you find on the Internet or with the results of calculations and you will arrive at an answer at the end. Be careful to use consistent units (milli vs kilo, etc).

The battery in an iPhone has a power rating of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mAHr. This means it can deliver \_\_\_\_\_\_\_\_\_\_\_\_\_\_ milli amps of current at its rated voltage (\_\_\_\_\_\_\_\_\_\_\_\_ V) for an hour before running out. This is not energy though. You need to convert this much power into an equivalent amount of energy, preferably in Joules.

So, how much power is in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ milliamps at \_\_\_\_\_\_\_\_\_\_\_\_\_ volts?

A current of 1 amp at 1 volt delivers 1 Joule of energy per second (this is one way amps and volts are defined). Therefore, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ milliamps at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ volts delivers \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Joules per second. One Joule/sec is defined as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the most common unit of electrical power.

The battery can keep up this rate of energy usage for 1 hour or \_\_\_\_\_\_\_\_\_\_\_\_ seconds. Therefore, the total energy in the battery is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Joules per second times \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ seconds for a total of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Joules.

Gasoline contains approximately 36,000 kiloJoules of energy per liter. Therefore, the amount of gasoline equivalent to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Joules of energy in the iPhone battery is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (units).