EE 201 — HW 1-15 Name_____

The owner of a house would like to unhook from the electric company and use only solar cell modules to generate electricity along with batteries to store enough energy for night-time use. The house uses 40 kW-hr of energy on a typical day. We can assume that on a typical day, there is enough sunlight to power the solar cells for 4 hours. If each solar module generates 225 W of power when the sun is shining, how many are needed to provide the total daily energy for the house. If each battery can store 5 kW-hours, how many are needed to store energy and provide power when the there is not enough sunlight to power the solar modules? If each solar cell module costs $200 and each battery costs $1000, what is the material cost of the system? If the power company charges $0.15/kW-hour, how long would it take to achieve "pay-back", where the cost of the solar/battery system is less that the corresponding cost of buying energy continuously from the power company?

For purposes of this problem, assume that power flow needed by the house is constant, i.e. it uses the same amount of energy every hour during the day.

solar panels = _____ batteries = _____

cost = _____ pay back time = _____

Write your answers — and whatever work will fit — on this sheet. Staple any sheets with additional work behind.