> **Answer all question on the back of this page (or on a separate sheet). Please be as neat as you can. Show all work, including units. Circle your final answer clearly.**

PLANNING AN EVA

The Portable Life Support System (PLSS) worn by the moon-walking Apollo astronauts did many things including: regulating suit pressure, providing breathable oxygen, removing carbon dioxide and humidity, regulating temperature, and providing communication between the astronauts and Earth.

One way to measure the capacity of the PLSS is in how much work it allows an astronaut to do. During the Apollo era, the amount of work was measured in BTUs (British thermal units). It is the amount of energy needed to heat one pound of water by one degree Fahrenheit.

The Apollo 11-14 PLSS had **4350 BTUs** available to use.
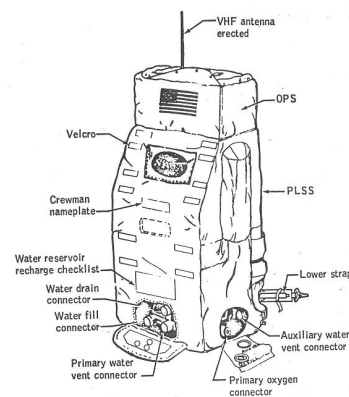
The table on the right shows the energy cost for walking, collecting samples, and resting on the lunar surface. The energy cost is expressed in BTUs per hour of activity.

Activity	Energy Cost
Walking (4 km/hr)	1625 BTU/hr
Science / Rock Collection	1100 BTU/hr
Resting	700 BTU/hr

1 (5 pts) Calculate how much energy an astronaut uses to walk **0.5 km**.

2 (10 pts) Calculate the longest amount time available to the astronauts to collect rocks if the collection site is **0.5 km** from the lunar module (LM). Remember they have to get back to the LM as well.

3 (10 pts) Calculate the longest amount time available to the astronauts to collect rocks if the collection site is **5 km** from the lunar module (LM). Remember they have to get back to the LM as well.

4 (10 pts) Calculate the longest amount time available to the astronauts to collect rocks if the collection site is **5 km** from the lunar module (LM). *But this time assume that walking at 4 km/hr takes the same amount of energy per hour as resting.* Remember they have to get back to the LM as well.