ESM 102

 Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Home Energy Problems

**SHOW EVERY STEP OF YOUR WORK!!!**

The goal of this exercise is to determine how much it would cost to heat a typical Portland house with various sources of energy: electricity, natural gas, wood, heating oil, gasoline, and big macs.

Use the following information to assist in the math that follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Energy Source** | **Unit** | **BTU Equivalence** | **Cost per Unit** |
| Electricity | Kilowatt hours (kWh) | 3412 BTU | $0.07 |
| Heating Oil | Gallon | 138,700 BTU | $2.50 |
| Gasoline | Gallon | 124,238 BTU | $3.43 |
| Natural Gas | Therm | 100,000 BTU | $0.99 |
| Wood (Oregon White Oak) | Cord | 18,000,000 BTU | $200 |
| Calorie | Cal | 3.968 BTU |  |
| Electric Wall Heater | 3000 watts |  |  |
| Big Mac Sandwich | 540 calories |  | $3.85 |

Assume you have a house in southeast Portland that is approximately 1,500 square feet. During the winter, your typical energy use to heat your house is 8,000,000 BTU. Determine how much of each equivalent energy source you would need and how much it would cost.

**Electricity (kWh):**

**Heating Oil (gallons):**

**Gasoline (gallons):**

**Natural Gas (therms):**

**Wood (cords):**

**Calories (Big Macs):**

*Bonus Question:*

Using the formula to convert watts to kilowatt hours, how much would it cost to run an electric wall heater (3000 watts) for 4 hours?