DATE: NAME: CLASS:

GENERAL

Problem Solving Using GRASP

BLM G-23

Goal • Learn how to solve problems using GRASP.

Introduction

Solving any problem is easier when you establish a logical, step-by-step procedure. One useful method for solving numerical problems includes five basic steps: Given, Required, Analysis, Solution, and Paraphrase. You can easily remember these steps because the first letter of each word spells the word GRASP.

What to Do

- Learn about the GRASP method of problem solving using the example.
- Answer the questions that follow.

Example

Ruby can afford to spend $45.00 this month on electricity. The company that supplies her home with electrical energy charges 10.9¢/kWh. Based on her budget, how many kilowatt hours of electrical energy can she use in a month?

Given

Organize the given data.
budget = $45.00
cost of electrical energy = 10.9¢/kWh

Required

Identify what information the problem requires you to find.
Need to find the amount of electrical energy that can be used (kWh).

Analysis

Decide how to solve the problem.

The units given for Ruby's budget (dollars) do not match the units given for the cost of 1 kWh of electrical energy (cents). Both units must be the same, so you need to convert cents into dollars. Then you need to calculate the number of kilowatt hours Ruby can afford to use. You know that total cost = (amount of energy used)(cost per unit of energy).

Solution

1. Convert units.
$1.00 = 100¢

$$10.9¢ \times \left(\frac{\$1.00}{100¢} \right) = \$0.109$$

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2. Use the total cost equation.

$$\text{total cost} = (\text{amount of energy used})(\text{cost per unit of energy})$$

$$\text{amount of energy used} = \frac{\text{total cost}}{\text{cost per unit of energy}}$$

$$= \frac{\$45.00}{\$0.109/\text{kWh}}$$

$$= 413 \text{ kWh}$$

Paraphrase

Restate the solution and check your answer.

Ruby has a budget of $45.00 and electrical energy costs 10.9¢/kWh, so she can afford to use 413 kWh of electrical energy this month.

Check: Multiply the cost of electrical energy by the answer, and you should get $45.00. Round off the numbers to do a quick estimate. If you multiply $0.11 by 400 kWh, you get $44.00, so you know that your answer is reasonable.

Questions

Use the GRASP method to solve the following questions.

1. Ruby's electricity company raises the price to 11.1¢/kWh. Calculate Ruby's energy bill if she uses 375 kWh in one month.

2. Frank's electricity bill is $62.00 this month. His electricity company charges 11.3¢/kWh. How many kilowatt hours of electrical energy did he use in the month?

3. Alyssa has an electricity bill for $57.50. She used 480 KWh of electricity. How much did her electricity company charge her in cents per kilowatt hour?

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