



Learning Project 2 Rates

Inquiry Activity 2-2: More Multi-step Problems and Rates

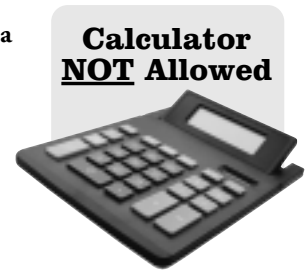
(Note: *Italicized portions should be directed to students.*)

1. Identifying the Problem (PA Test item #16) Calculator not allowed Instructor directed.

Read the question carefully, as you would if taking the actual test.

16. A company charges \$60 per day plus \$0.50 per mile for truck rentals. If Greg rents a truck for 3 days and drives it a total of 150 miles, what will the company charge?

- (1) \$110
- (2) \$135
- (3) \$230
- (4) \$255
- (5) \$300



Here are some problem clarification questions you may want to consider when reading test questions.

What words and/or symbols might be important to understand to answer this problem and what are they telling you?

What words and/or symbols are unfamiliar and what do you think they mean?

2. Becoming Familiar with the Problem (Instructor directed.)

Ask yourself questions like these about the problem. Take note of the ones that were especially helpful so that you can remember to use similar thinking questions when you take the test.

Reread the question. What is the question really asking?

Which information in the problem is relevant to what you need to find?

What do you already know about renting cars, trucks or other equipment?

3. Planning, Assigning and Performing Tasks

Try to answer the test question any way you can, even if you have to guess, but become aware of the reasoning and operations that you are using. The following directions and questions can be helpful as strategies to use solve test questions.

Planning

What is the problem asking you to do in terms of mathematics...bringing things together, separating things, or comparing things?

This is a bringing things together problem.

How many steps will it take to find the answer, what is the order of the steps, and what math will you perform at each step?

A multiple step problem, in which it is important that the cost of each service is brought together with the appropriate cost of that particular service: 1) The \$60.00 per day must be multiplied by the number of days (3) to get the total cost of that part of the transaction (per day is a key term); 2) the \$0.50 per mile must be multiplied by the number of miles driven (150) to get the total cost of that part of the transaction; and 3) add the two totals to get the final answer.

Doing the Work

Represent this problem as a mathematical expression or equation that includes the steps and the math required at each step.

Estimate an answer – tolerate some fuzziness, but be aware of the steps you took to make the estimate, even if you guessed.

Review the multiple-choice answers and eliminate some answers that seem unreasonable. Remember your reasoning so you can share it later.

Knowing that 3 days of rental will cost \$60 per day, or \$180 by itself, indicates that the first two multiple-choice answers can be eliminated.

Find the answer.

Compare your answer to the estimate.

Is the answer reasonable?

Be ready to defend your answer (whether you worked individually or with someone else) and the way you found it.

4. Sharing with Others

Telling other people what you know helps you to understand the material better. So take this opportunity not only to share the knowledge, but also to learn it more completely.

Small Groups: *Compare your answer to others in the group and explain why and how you found it and why you think yours is correct.*

Without looking it up, tell what you think the meaning of the word, ‘per’ is in this problem.

Come to an agreement in your group as to the steps you would recommend for solving this problem. Write them as step 1, step 2, etc.

Share your estimation strategies with the others in the group. Choose one strategy to report to the whole class.

Write a mathematical expression that shows what your group did to find the correct answer.

Write your answer in sentence form.

Whole Class: *Report to the class the steps you decided on to answer this question, the mathematical expression that summarizes them, and the estimation strategy that you would recommend.*

Take notes on any different ways that others used to find the answer.

5. Reflecting, Extending and Evaluating

This activity can be an instructor-led discussion or done in pairs or small groups, whatever the learners feel more comfortable with.

Reflecting: *Think about what you learned.* (group activity or instructor led.)

Here are some questions to start you thinking about the experience you just had. Thinking about what you have learned and experienced is part of the learning process. When the focus is only on the answer, you don’t get much time to think about what was learned.

This item was NOT in the calculator section of the test. Analyze your work in setting up and solving this problem, noting those steps where the calculator would have been helpful to you and where it was not.

Explain why multiplication was suitable for the first two steps and addition for the last.

From the last item, many should remember that multiplication brings together a number of numbers that are the same while addition brings together numbers that are different.



How would you have figured the total amount if you were actually renting a truck?

Most would wait for the bill to be presented to them by the clerk. Others could point out that you need to have an estimate in your mind, so that you can tell whether the total is reasonable.

Which factors, other than price, are important considerations for you when renting a vehicle?

Extending: Extend what you learned to new situations.

In extending, you are being asked to transfer the information presented in the Practice Test question to other information or situations you already know and maybe make new connections to other information.

What if the question had told you that Greg had traveled 150 miles and that he was charged \$75 for mileage. How would you have found the rate per mile?

This question is an example of how division undoes multiplication and can also serve as a warning to those who are used to finding key words, like 'per' and thinking that it will always mean that they will multiply.

What did you learn in the last Inquiry Activity that helped you solve this problem?

How is this problem different from the problem in the last Inquiry Activity? How is it the same?

Make up at least one test question on providing and charging for services that are similar to this problem. Pass out your question for others in the class to solve.

Evaluating: Assess what you learned and how you learned it.

In this last step, you get a chance to review the content of what you learned and the methods used to learn. There are no right or wrong answers to these questions; it is your chance to look more closely at your learning style and the opportunity to state how you benefited or didn't benefit from the content and/or the methods to help you pass the GED test.

Make a note of any computation difficulties that this item exposed and arrange to practice if you need it.

How were you able to keep sets of related numbers together so that you can do the proper calculations with them? What were the clues that you used?

It is important that the amount of each service is brought together with the appropriate cost of that particular service: 1) The \$60.00 per day must be multiplied by the number of days (3) to get the total cost of that part of the transaction; 2) the \$0.50 per mile must be multiplied by the number of miles driven (150) to get the total cost of that part of the transaction. The word 'per' is key to keeping them straight.

Think back on how you figured out how to solve this problem. If a friend asked you what was the most important thing to remember while problem solving, what would you say?