

Additional Practice 13-4 Reasoning

Another Look!

There are 37 cars parked in the school parking lot at 5:00. There are 9 more cars at 5:30. At 6:00, there are twice as many cars as at 5:30. How many cars are in the lot at 6:00?

Use expressions to represent the quantities and relationships in the problem. You can use diagrams to help.

37 cars at 5:00 9 more at 5:30



37



$37 + 9$

Twice as many at 6:00



$(37 + 9) \times 2$



$$(37 + 9) \times 2 = 46 \times 2 = 92$$

So, there are 92 cars at 6:00.

Reasoning can help you understand how the quantities in a problem are related.



Reasoning

Ms. Lang lives in St. Paul, Minnesota. Last year, she made 4 round trips to Madison, Wisconsin, and 3 round trips to Bismarck, North Dakota. How many more miles did she travel in her trips to Bismarck than in her trips to Madison?



- Write an expression to represent the difference between the total number of miles in the Bismarck trips and the total number of miles in the Madison trips. You can use a diagram to help.

Sample answer: $(3 \times 2 \times 437) - (4 \times 2 \times 260)$

- Explain how the numbers, symbols, and operations in your expression represent the problem.

(2×437) represents the number of miles in a round trip to Bismarck. This quantity is multiplied by 3 because there were 3 round trips. (2×260) represents the number of miles in a round trip to Madison. This quantity is multiplied by 4 because there were 4 round trips. The two products are subtracted to find the difference in the total distances.

- How many more miles did Mrs. Lang travel in her trips to Bismarck than in her trips to Madison? Explain how you solved the problem.

542 miles; I evaluated the expression in Exercise 1: $(3 \times 2 \times 437) - (4 \times 2 \times 260) = 2,622 - 2,080 = 542$





Performance Task

Camping Trip

Ross is planning a camping trip for 136 scouts. He has reserved 4 buses. The scouts will sleep in tents or cabins. If they fill every bed in the cabins, how many campers will sleep in tents?

4. **Make Sense and Persevere** What information in the problem do you need?

There are 136 scouts and 14 cabins with 4 beds in each cabin.

5. **Reasoning** Describe the calculations needed to solve the problem and explain the order in which you need to do them. You can use a diagram to help.

Multiply 14×4 to find the number of campers that can sleep in the cabins. Then subtract the sum from 136.

6. **Model with Math** Write an expression to represent the number of campers that will sleep in tents.

Sample answer: $136 - (14 \times 4)$

7. **Critique Reasoning** Ross says he does not need grouping symbols in the expression that represents this problem. Is he correct? Explain.

Ross is correct. He could use the expression $136 - 14 \times 4$. According to the order of operations, the multiplication would be done before the subtraction.

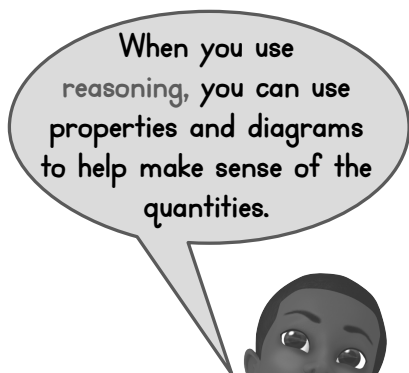
8. **Be Precise** Find the number of campers that will sleep in tents. Explain how you found the answer.

80 campers; Sample explanation: I evaluated the expression in Exercise 6: $136 - (14 \times 4) = 136 - 56 = 80$

State Park

14 cabins

Each cabin has 4 single beds.



When you use reasoning, you can use properties and diagrams to help make sense of the quantities.

