

TCAP/CRA 2012-2013



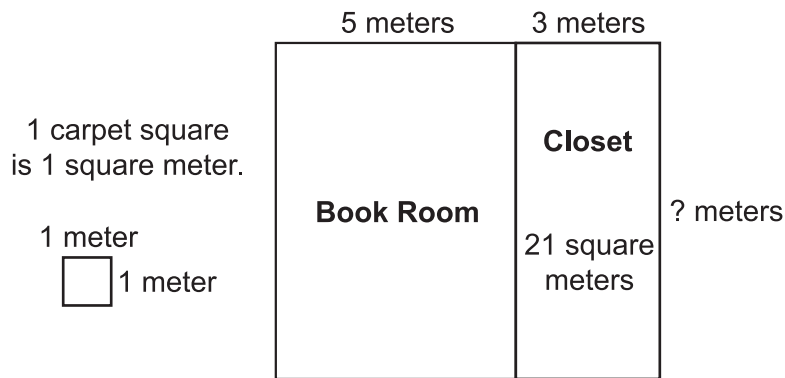
Task 1: Carpet Squares Task

NOTE: This is the universally scored task for Grade 3. Please visit www.tncore.org for more information on Phase II updates and changes.

Full Scoring Guide

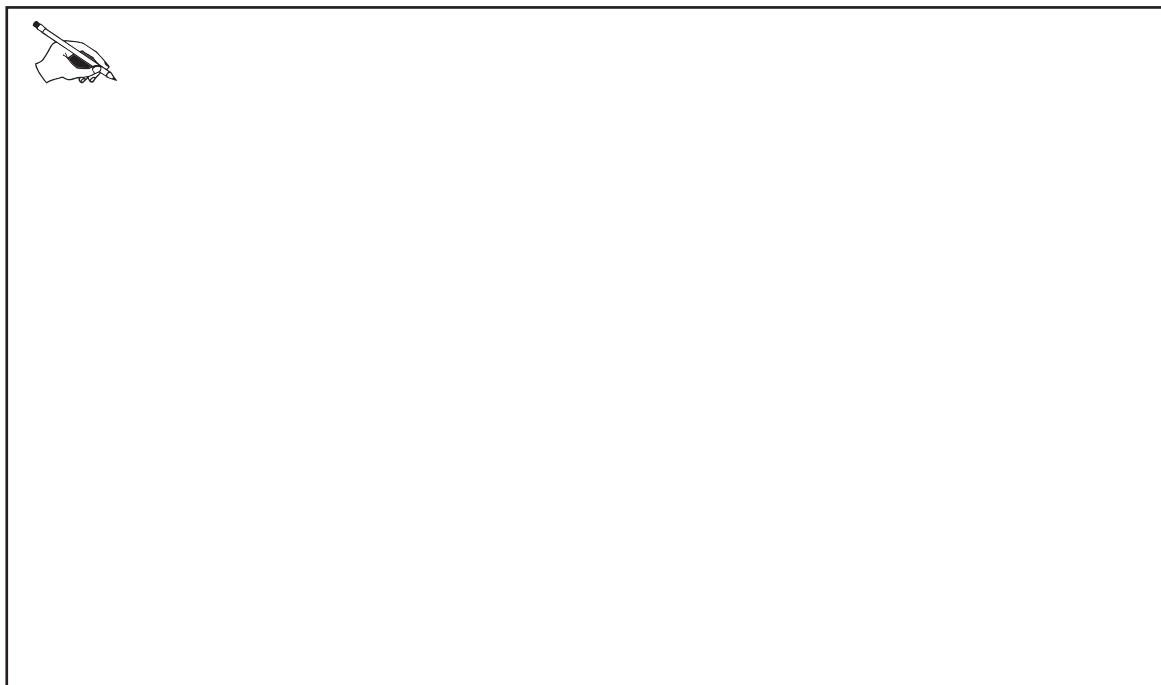
Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:

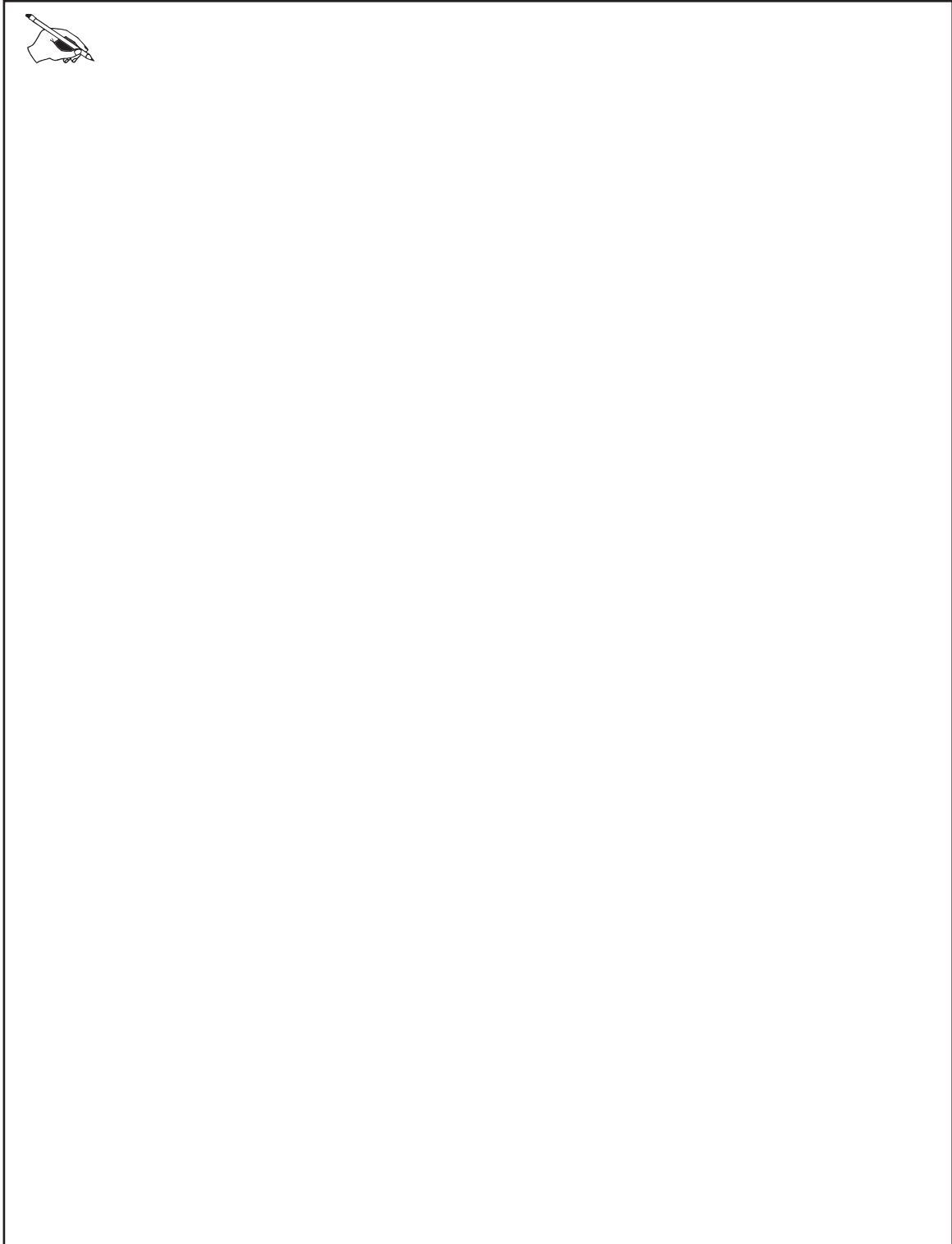


Jake says: "The width is missing from the diagram. I only see ' ? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.



- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.



1. Carpet Squares Task Scoring Guide

The CCSS for Mathematical Content (3 points)

3.OA.1 The student recognizes that multiplication can be used as a means of finding the missing side length and writes an appropriate multiplication equation or expression to find the side length of the closet. The student receives credit for 3.OA.1 or 3.OA.2, but not both. Credit is given for the content standard that best indicates the process the student used to find the side length of the closet. _____

OR

3.OA.2 The student recognizes that division can be used as a means of finding the missing side length and writes an appropriate division equation or expression to find the side length of the closet. The student receives credit for 3.OA.1 or 3.OA.2, but not both. Credit is given for the content standard that best indicates the process the student used to find the side length of the closet. _____

3.OA.3(a) The student determines the missing side length of the closet using multiplication or division. _____

3.OA.3(b) The student determines how many carpet squares Jake will need to cover the floor of the book room using multiplication or division. _____

Total Content Points _____

The CCSS for Mathematical Practice (5 points)

MP1 The student uses known information about the closet to determine the unknown dimension and then makes use of the side length of the closet to determine the number of carpet squares needed to cover the floor of the book room. The student completes all parts of the task. _____

(MP1: Make sense of problems and persevere in solving them.)

MP2 The student determines the unknown side length of the closet and the area of the book room using equations and makes reference to the square units of carpet needed. _____

(MP2: Reason abstractly and quantitatively.)

MP3 The student provides an explanation for how the number of carpet squares needed to cover the floor of the book room can be determined. _____

(MP3: Construct viable arguments and critique the reasoning of others.)

MP4 The student provides an accurate multiplication or division equation that is used to find the side length of the closet and/or provides an accurate multiplication equation that is used to determine the area of the book room. _____

(MP4: Model with mathematics.)

MP6 The student correctly determines the side length of the closet and the number of carpet squares needed to cover the floor of the book room, and labels quantities. _____

(MP6: Attend to precision.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Represent and solve problems involving multiplication and division.

- 3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7 .*
- 3.OA.2 Interpret whole-number quotients of whole numbers; e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*
- 3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

The CCSS for Mathematical Practice*

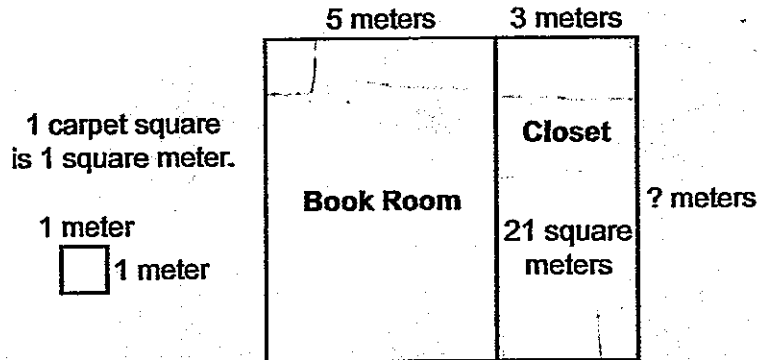
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*Gray text indicates Mathematical Practices that are not addressed in this task.

Students' responses to a mathematical task provide evidence of what they understand and are able to do in relation to the standards and practices. Across tasks, this cumulative evidence shows students' understanding and abilities within a domain. When students do not respond completely to all parts of a task, they provide insufficient evidence of their mathematical understanding and abilities and therefore do not fully demonstrate the expectations of the standards and practices aligned with that task.


Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:




Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

 $21 \div 3 = 7$ The missing side length would be 7.

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.

 $7 \times 5 = 35$ } Jake will need 35
carpet squares to cover the book
room. I know because if the closet
was 7 meters then the book
room should be 7 meters.

Guide 1

Litho 15009

Total Content Points: 3 (3.OA.2, 3.OA.3(a), 3.OA.3(b))

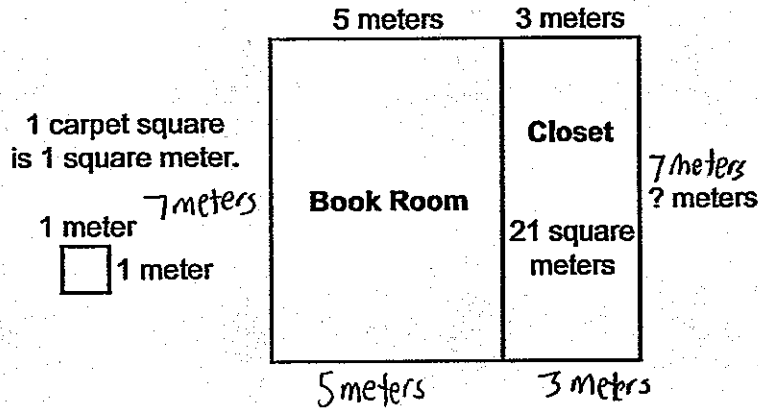
Total Practice Points: 5 (MP1, MP2, MP3, MP4, MP6)

The student recognizes that division can be used as a means of finding the side length of the closet and uses the equation $21 \div 3 = 7$ to determine 7 as the missing side length (3.OA.2, 3.OA.3(a)). The student uses the equation $7 \times 5 = 35$ to calculate how many carpet squares are needed to cover the book room floor (3.OA.3(b)). The student uses information about the closet to determine the unknown dimension of the closet and then uses that dimension to determine the number of carpet squares needed to cover the book room floor, completing all parts of the task (MP1). The student correctly determines the side length of the closet, the area of the book room, and the number of carpet squares needed to cover the floor of the book room, and labels the answer in Part B as carpet squares needed (MP2, MP6). The explanation in Part B stating that “if the closet has $\times 7$ meters then the book room should be $\times 7$ meters” is clear (MP3). An accurate division equation and a correct multiplication equation are used to model both of the problems (MP4).

Total Awarded Points: 8 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:



Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

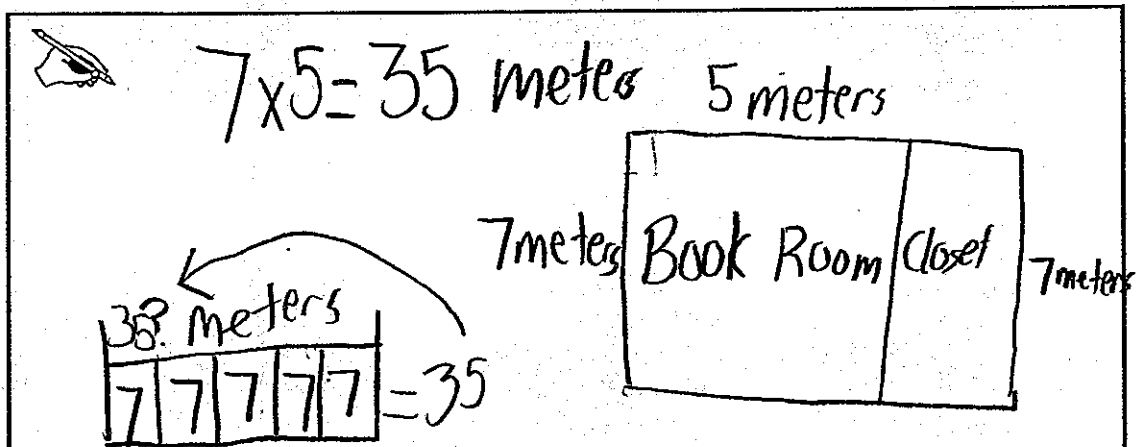
$21 \div 3 = 7$

$3 \overline{) 21}$
 $\underline{- 21}$
 00

$7 \times 3 = 21$

The side length of the closet is 7 meters.

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.



I discovered that you need 35 carpet squares to cover the book room because the side of the closet is 7 meters so they side of the book room is 7 meters and the top of the book room is 5 meters so I multiplied 7×5 to get 35 meter and

there is 1 square meter in a carpet square so there is 35 carpet squares

Guide 2

Litho 15013

Total Content Points: 3 (3.OA.2, 3.OA.3(a), 3.OA.3(b))

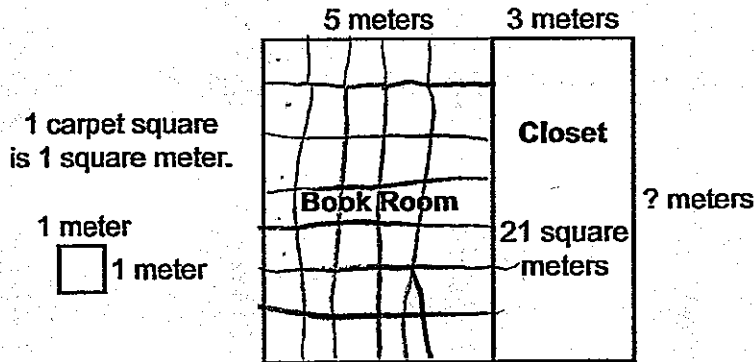
Total Practice Points: 5 (MP1, MP2, MP3, MP4, MP6)

The student recognizes that division can be used as a means of finding the side length of the closet and uses the equation $21 \div 3 = 7$ to determine 7 as the missing side length (3.OA.2, 3.OA.3(a)). The student uses the multiplication equation $7 \times 5 = 35$ to calculate how many carpet squares are needed to cover the book room floor (3.OA.3(b)). The student uses information about the closet to determine the unknown dimension, and then uses that dimension to determine the number of carpet squares needed to cover the book room floor, completing all parts of the task (MP1). The student finds the length of the unknown side of the closet and the area of the book room and refers to the square units of the book room floor as 35 meters (MP2). In Part B, the student clearly explains how 35 meters was calculated and provides an accurate equation, $7 \times 5 = 35$ (MP3). An accurate division equation, $21 \div 3 = 7$, for the missing side length of the closet is provided in addition to the correct multiplication equation, $7 \times 5 = 35$, for determining the number of carpet squares needed for the book room (MP4). The student correctly determines the side length of the closet and the number of carpet squares needed to cover the floor of the book room and labels the carpet squares in meters (MP6).

Total Awarded Points: 8 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:



Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

5 meters 3 meters

Book Room Closet


3 meters

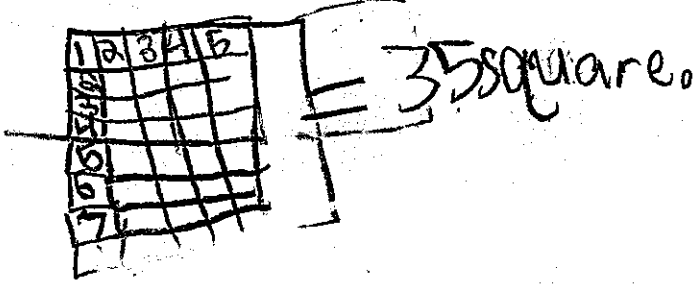
The closet is 15 meters

15 meters

15 meters

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.

 Jake's book room looks like it will take 35 square. I know this because $7 \times 5 = 35$.



Guide 3 Litho 15019

Total Content Points: 1 (3.OA.3(b))

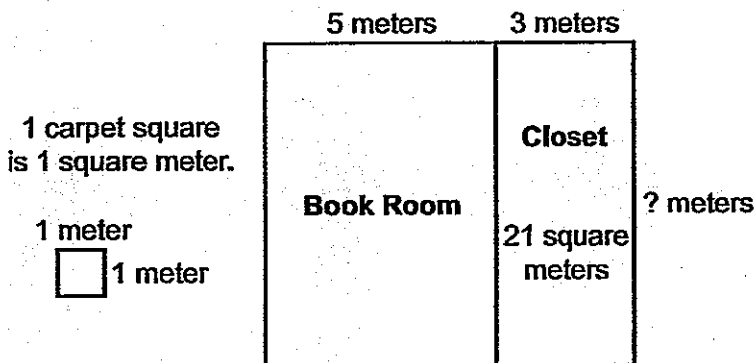
Total Practice Points: 2 (MP3, MP4)

The student correctly calculates in Part B how many carpet squares are needed to cover the book room floor using the multiplication equation $7 \times 5 = 35$ (3.OA.3(b)). However, in Part A neither multiplication nor division equations are used to determine the missing side length of the closet (no credit for 3.OA.1 or 3.OA.2). The student incorrectly identifies in Part A that 15 is the missing side length of the closet (no credit for 3.OA.3(a), no credit for MP2). The diagram provided in Part B clearly shows the lengths of the book room floor to be 5 and 7, and the student multiplies $5 \times 7 = 35$ and states that the book room “will take 35 square” (MP3, MP4). The task is not completed because the student does not provide multiplication or division equations in Part A and incorrectly gives the missing side length of the closet as 15 (no credit for MP1). The incorrect answers in Part A make the problem inaccurate (no credit for MP6).

Total Awarded Points: 3 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:



Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

$21 \div 3 = 7$

The missing number is 7

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.



$$5 \times 5 = 25$$

It is 25 because if you see on the front 5 on the top of the book room and the bottom could also be 5, $5 \times 5 = 25$ then

Guide 4

Litho 15003

Total Content Points: 2 (3.OA.2, 3.OA.3(a))

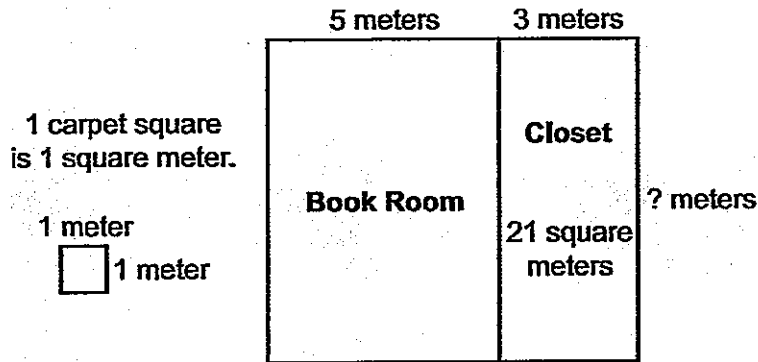
Total Practice Points: 1 (MP4)

The student recognizes that division can be used as a means of finding the missing side length of the closet by using the equation $21 \div 3 = 7$ and states the quotient, 7, as the missing length (3.OA.2, 3.OA.3(a)). The student uses an incorrect multiplication equation to find the area of the book room and gives an incorrect answer (no credit for 3.OA.3(b)). An accurate division equation for the missing side length of the closet, $21 \div 3 = 7$, is provided (MP4). The student has not correctly completed all parts of the task and shows an incorrect understanding of how to use multiplication to find the area of a rectangle (no credit for MP1, no credit for MP2). The explanation given for determining the number of carpet squares to cover the book room floor is not logical (no credit for MP3). The unclear explanation for finding the area of the book room, coupled with the incorrect answer, shows a lack of precision in the response (no credit for MP6).

Total Awarded Points: 3 out of 8

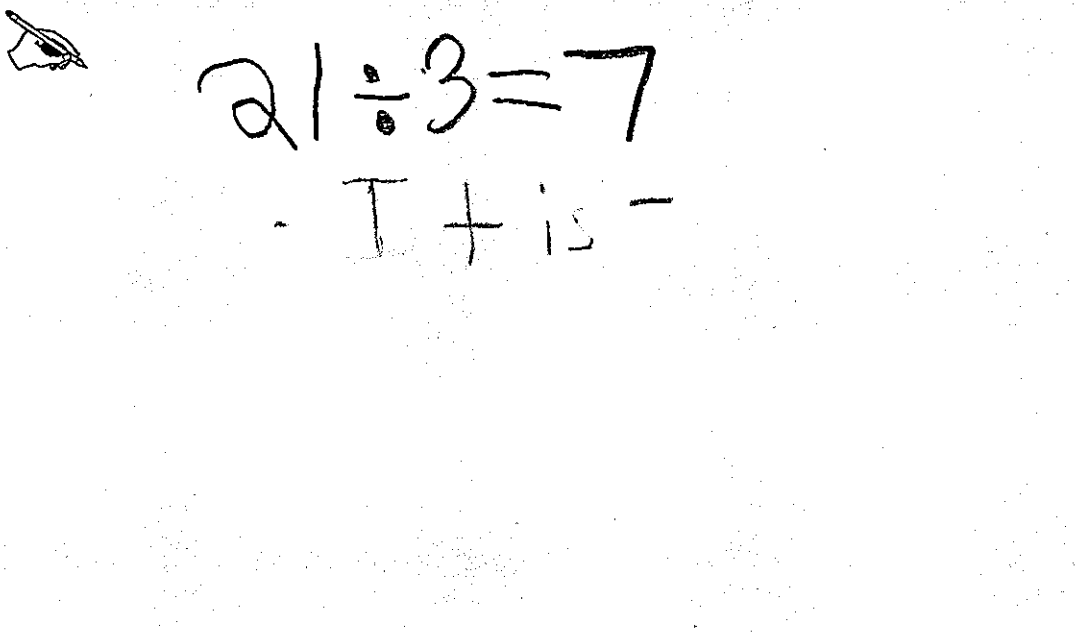
Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:



Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

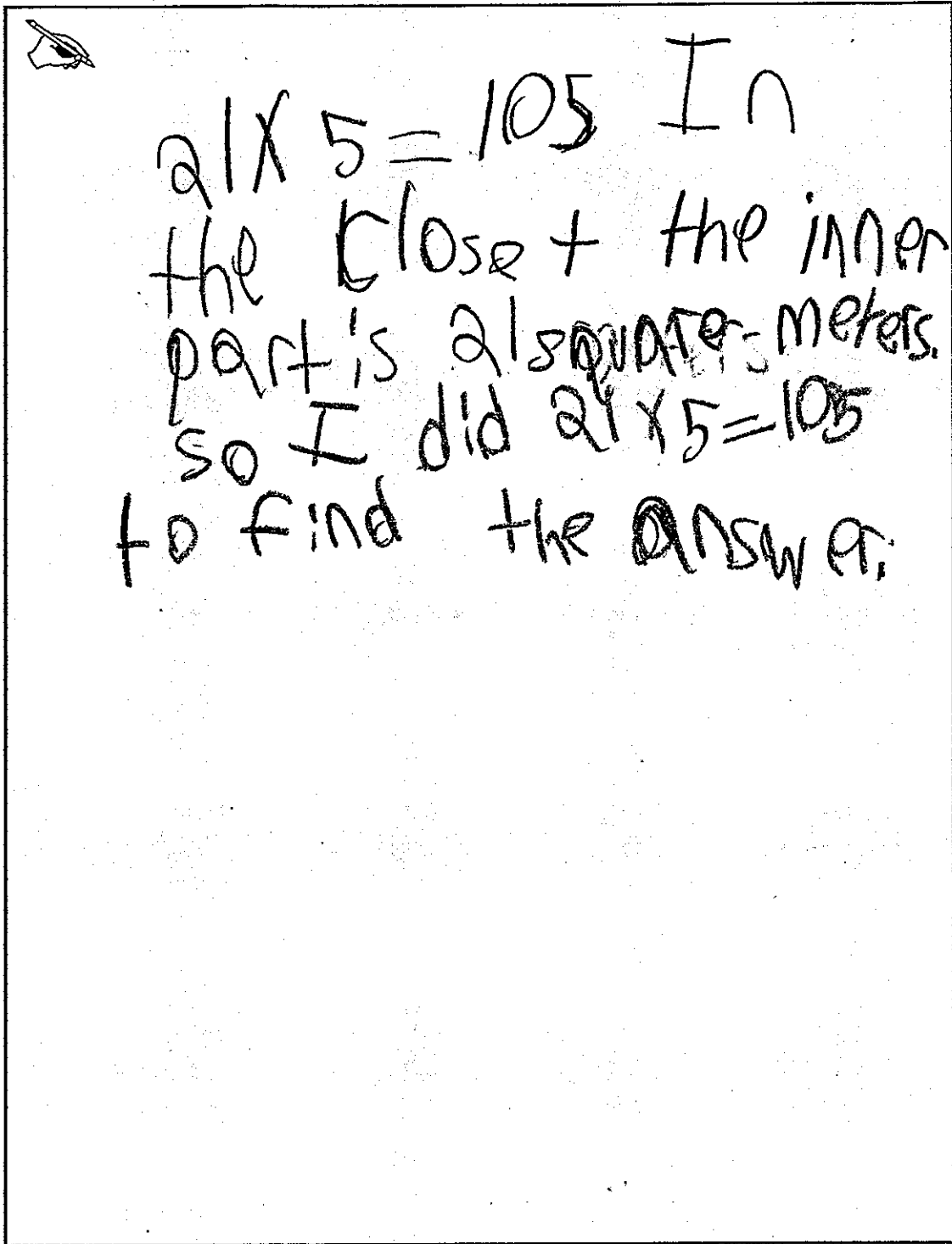
- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.



$21 \div 3 = 7$

- I + is -

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.



A handwritten student response is shown in a rectangular box. In the top left corner of the box is a small drawing of a hand holding a pencil. The text is written in cursive and reads: "21 x 5 = 105 In the closet + the inner part is 21 square meters. So I did 21 x 5 = 105 to find the answer."

Guide 5

Litho 15001

Total Content Points: 2 (3.OA.2, 3.OA.3(a))

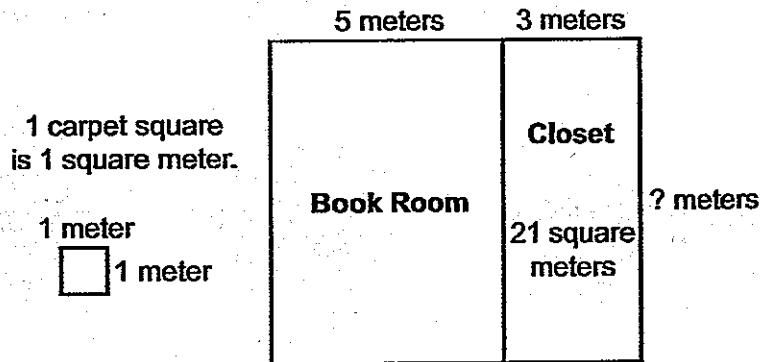
Total Practice Points: 1 (MP4)

The student recognizes that division can be used as a means of finding the missing side length of the closet and uses the equation $21 \div 3 = 7$ to determine 7 as the missing length (3.OA.2, 3.OA.3(a)). An incorrect equation, $21 \times 5 = 105$, is provided for finding how many carpet squares are needed to cover the book room floor (no credit for 3.OA.3(b)). An accurate division equation, $21 \div 3 = 7$, for the missing side length of the closet is provided (MP4). The explanation given for finding the number of carpet squares needed to cover the floor of the book room is incorrect, meaning all parts of the task are not completed correctly (no credit for MP1, no credit for MP3). An incorrect equation, $21 \times 5 = 105$, is provided for determining the size of the book room floor (no credit for MP2, no credit for MP6).

Total Awarded Points: 3 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:



Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

$21 \div 3 = 7$

Length of the carpet is 7 meters.

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.



He will need to have
7 meters of carpet because
The closet length is
as long as the book
room.

Guide 6

Litho: 15000

Total Content Points: 2 (3.OA.2, 3.OA.3(a))

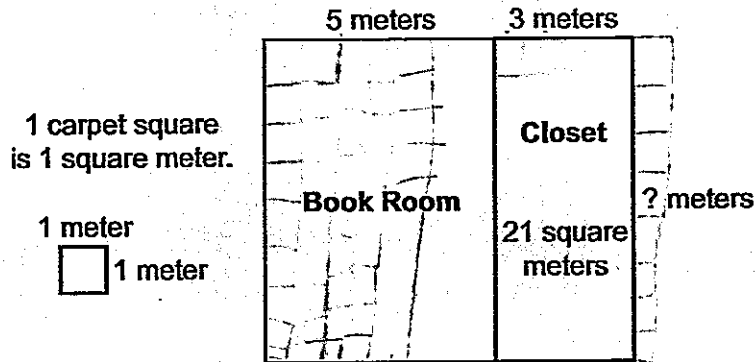
Total Practice Points: 1 (MP4)

The student recognizes that division can be used as a means of finding the missing side length of the closet with the equation and uses an appropriate equation, $21 \div 3 = 7$, to determine the correct length (3.OA.2, 3.OA.3(a)). The student provides an accurate division equation to find the missing side length of the closet (MP4). The student does not address how to determine how many carpet squares Jake will need to cover the floor of the book room in Part B (no credit for 3.OA.3(b), no credit for MP3); therefore, the student does not complete all parts of the task (no credit for MP1). The student never makes reference to the square units of carpet needed for the book room floor (no credit for MP2, no credit for MP6).

Total Awarded Points: 3 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:




Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

Jake could do $21 \div 3$ and get 7 so there could be seven meters and that could mean that there are 7 meters on each side.

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.

 I think he will need 34 squares because it is 5 meters at the top and bottom and I think it's 7 on the side so $5+5+7=17$ and if you add 17 plus 17 you get 34.

$$\begin{array}{r} 17 \\ \times 2 \\ \hline 34 \end{array}$$

Guide 7

Litho 15008

Total Content Points: 2 (3.OA.2, 3.OA.3(a))

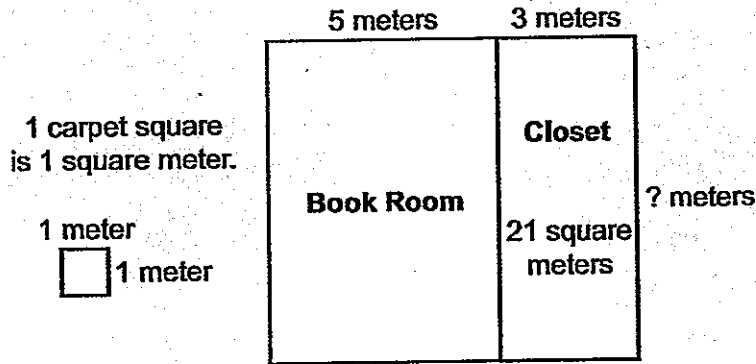
Total Practice Points: 0

The student recognizes that division can be used as a means of finding the missing side length of the closet with the expression $21 \div 3 = 7$ (3.OA.2). The student uses this division expression to determine 7 as the missing length and states that the length is 7 meters (3.OA.3(a)). The student is unable to create an acceptable equation for finding the area of the book room floor; even though he knows the dimensions are 5 and 7, the student uses $17 \times 2 = 34$ to attempt to find the area (no credit for 3.OA.3(b)). In Part B, the explanation provided states that Jake will need 34 squares of carpet because $5 + 5 + 7 = 17$, which is an incorrect approach to the problem (no credit for MP2, no credit for MP3). The student does not complete all parts of the task, as an accurate equation was not provided to solve either problem (no credit for MP1, no credit for MP4). Although both answers are labeled, and the expressions shown are calculated correctly, the student does not find the correct number of squares needed to cover the book room floor (no credit for MP6).

Total Awarded Points: 2 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:




Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

21 square meters - 3 meters = 18 meters

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.

 The closet equals half of the book room, and the closet needs 21 carpet squares. So, if you multiply 21×2 and get 42 carpet squares you get your answer.

Total Content Points: 0

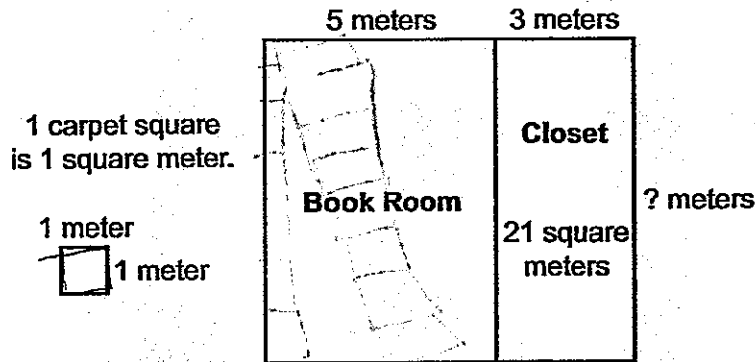
Total Practice Points: 0

This student incorrectly uses subtraction to solve for the missing side length of the closet in Part A. The student does not recognize that multiplication or division should be used to find the missing side length of the closet (no credit for 3.OA.1 or 3.OA.2). The student does not correctly find the missing length of the closet (no credit for 3.OA.3(a)). In the explanation given for Part B, the student incorrectly states that the closet equals half of the book room and then multiplies $21 \times 2 = 42$, demonstrating a lack of understanding of the correct process for finding the area of the book room (no credit for 3.OA.3(b), no credit for MP2). The student provides an explanation in Part B, but it is incorrectly reasoned and not viable (no credit for MP3). The student does not complete all parts of the task accurately (no credit for MP1, no credit for MP6). The student does not use a multiplication or division equation in the response (no credit for MP4).

Total Awarded Points: 0 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:



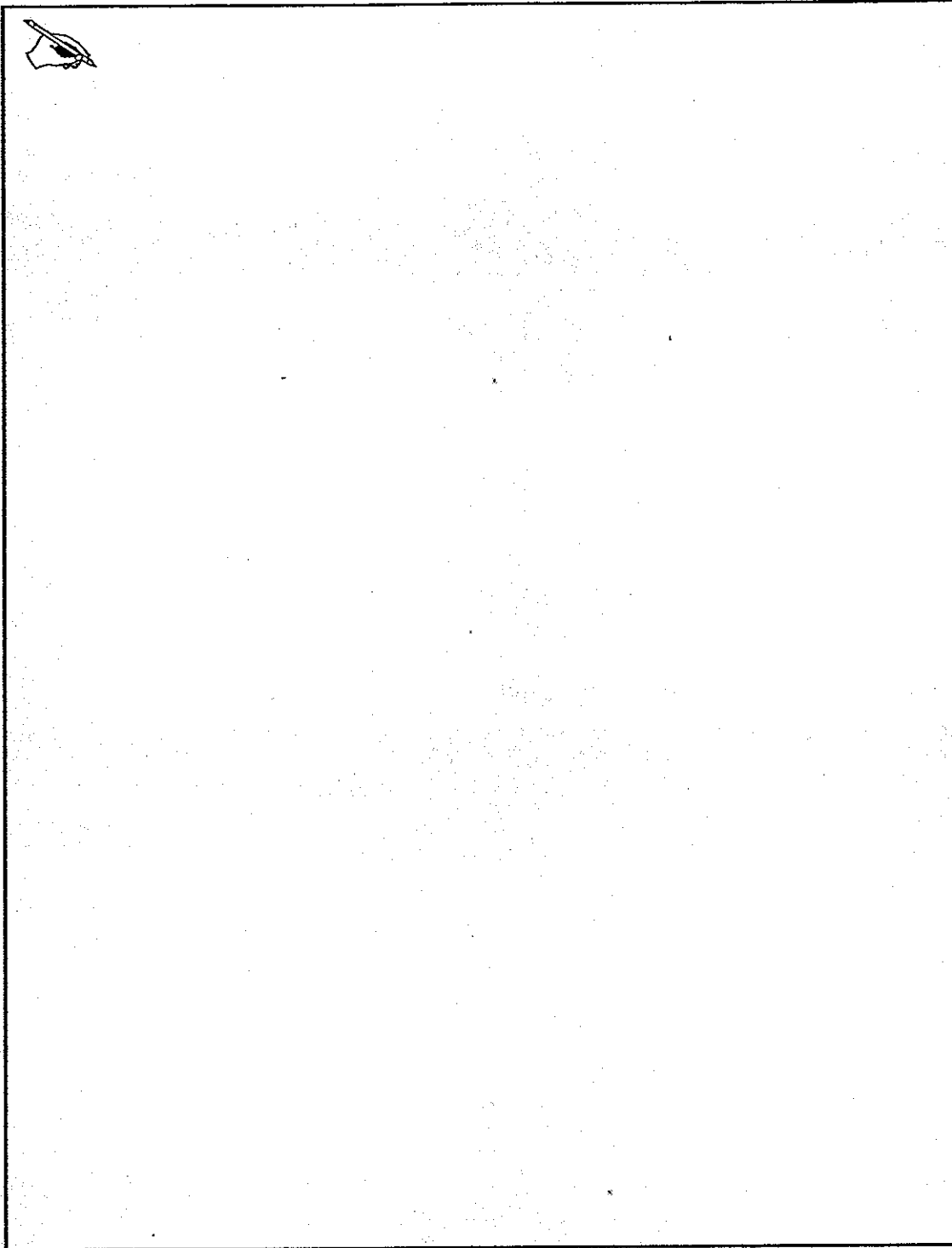
Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

It would take 42 squares because the closet is half of the book room

$$\begin{array}{r} 21 \\ + 21 \\ \hline 42 \end{array}$$

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.



Total Content Points: 0

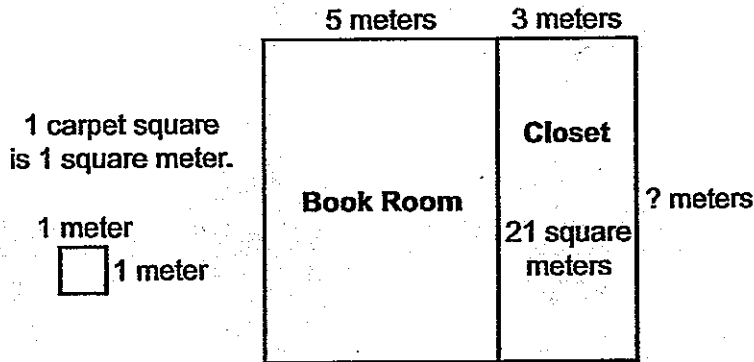
Total Practice Points: 0

No multiplication or division is used in this response (no credit for 3.OA.1 or 3.OA.2). The student does not attempt to find the missing side length of the closet and therefore has not responded to all parts of the task (no credit for 3.OA.3(a), no credit for MP1). The student incorrectly finds the number of squares needed to cover the book room floor (no credit for 3.OA.3(b), no credit for MP6), and the explanation given is incomplete and incorrect (no credit for MP3). The student does not model either problem with a division or multiplication equation (no credit for MP4), and the reasoning demonstrated in finding the number of squares needed to cover the book room floor is incorrect (no credit for MP2).

Total Awarded Points: 0 out of 8

Task 1. Carpet Squares Task

Jake wants to cover the floor of his book room and closet with carpet squares. Each carpet square is 1 square meter. Here is a diagram of the area he wants to cover with carpet squares:



Jake says: "The width is missing from the diagram. I only see '? meters' where the width should be. I will have to lay carpet squares in the closet so I can figure out how many carpet squares I need to cover the floor of the closet and the book room."

- a. Help Jake understand how to determine the missing side length of the closet without laying carpet squares. Write a multiplication or division equation and use it to find the side length of the closet.

$21 \times 4 = 84$

$$\begin{array}{r} \times 21 \\ 4 \\ \hline 84 \end{array}$$

84

The side Closet is 84 meters.

- b. Determine how many carpet squares Jake will need to cover the floor of the book room. Explain using words and a multiplication equation how you determined the number of carpet squares needed to cover the floor of the book room.

$$\begin{array}{r} 21 \\ \times 5 \\ \hline 105 \end{array}$$

105

21 | 21 | 21 | 21 | 21

It I did 21×5 because it said 21 met. and 5 met.

5 met. 3 meters
 1 meter BR C ? meters
 □

Guide 10

Litho 15011

Total Content Points: 0

Total Practice Points: 0

Although they are correctly calculated, the multiplication equations and diagrams provided do not model the content of the problem (no credit for 3.OA.1 or 3.OA.2, no credit for MP4). The answers the student finds for the missing side length of the closet and the number of carpet squares needed to cover the floor of the book room are both incorrect (no credit for 3.OA.3(a), no credit for 3.OA.3(b), no credit for MP6). Lacking an acceptable multiplication equation or explanation, the student does not address any parts of the task (no credit for MP1, no credit for MP3). The incorrect use of equations shows a lack of understanding of how to use equations to solve problems (no credit MP2).

Total Awarded Points: 0 out of 8