Tennessee Comprehensive Assessment Program

TCAP/CRA 2013

4

Task 1 Scoring Guide

Orange Juice Task

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.

b. Write one or more subtraction expressions that match your diagram.

1. Orange Juice Task Scoring Guide

The CCSS for Mathematical Content (2 points)

4.NF.B.3a Indicates an understanding of addition and subtraction of fractions by: _____

- subtracting $\frac{3}{4}$ gallon at least once.
- adding $\frac{3}{4}$ gallon at least twice to find the total amount consumed.
- showing the equation $5\frac{1}{4} - 4 = 1\frac{1}{4}$.

(1 Point)

4.NF.B.3d Determines that the 4 gallons is not enough to last through the week. Reasoning may be explained by: _____

- showing through a diagram the amount of orange juice consumed each day. It should be evident from the diagram that there will not be enough orange juice for the week.
- using repeated subtraction of $\frac{3}{4}$ from 4 gallons to show that the family will not have a sufficient amount of juice.
- using a multiplication equation to show that the family will not have a sufficient amount of juice.

(1 Point)

Total Content Points _____

The CCSS for Mathematical Practice (2 points)

MP1 Indicates a correct solution path using any mathematical operation for determining whether or not Mrs. Martinez's son is correct. Also includes a subtraction equation related to the context. (*Note*: the student can subtract/add incorrectly and still receive this point as long as the student's critique is based on a comparison to 7 days.) _____

(1 Point)

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

MP4 Models with a diagram and one or more expressions and/or equations to show that $\frac{3}{4}$ gallon of orange juice is being consumed each day. _____

(1 Point)

(MP4: Model with mathematics.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

4.NF.B.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations 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. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.

Days	How Much Orange Juice is left
Monday	3 1/4 gallons left
Tuesday	2 1/2 gallons left
Wednesday	1 3/4 gallons left
Thursday	1 gallon left
Friday	1/4 gallons left
Saturday	0 1/2 gallons left
Sunday	0 gallons

Yes, Mrs. Martinez's son is correct because if you use a chart you take away $\frac{3}{4}$ every time you subtract, and they wouldn't have enough for Saturday & Sunday.

Litho#: 467438

b. Write one or more subtraction expressions that match your diagram.

$4 - \frac{3}{4}$

$3\frac{1}{4} - \frac{3}{4}$

$2\frac{1}{2} - \frac{3}{4}$

$1\frac{3}{4} - \frac{3}{4}$

$1 - \frac{3}{4}$

Anchor 1 Litho 467438

Total Content Points: 2 (4.NF.B.3a, 4.NF.B.3d)

Total Practice Points: 2 (MP1, MP4)

The student indicates an understanding of the subtraction of fractions by providing expressions in Part B that show subtraction by $\frac{3}{4}$ gallon $\left(4-\frac{3}{4}, 3\frac{1}{4}-\frac{3}{4}, 2\frac{1}{2}-\frac{3}{4}, \ ...\right)$ (4.NF.B.3a). In Part A, the student determines that 4 gallons is not enough to last through the week by producing a chart showing the amount of orange juice consumed each day and explaining "if you use a chart you take away $\frac{3}{4}$ every time you subtract" (4.NF.B.3d). The student provides a correct solution path through the 7-day chart and shows subtraction expressions to prove that Mrs. Martinez's son is correct (MP1). The diagram and expressions appropriately model the consumption of $\frac{3}{4}$ gallon of orange juice per day (MP4).

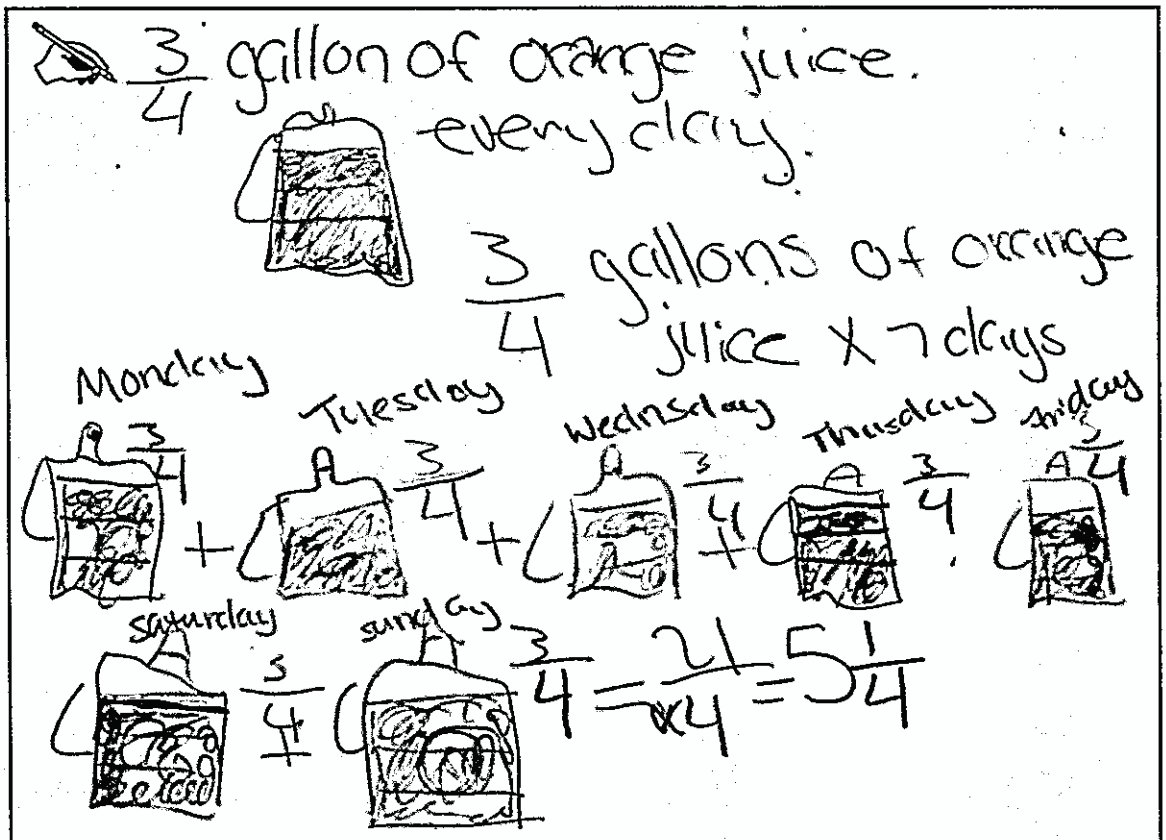
Total Awarded Points: 4 out of 4

A-2a

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

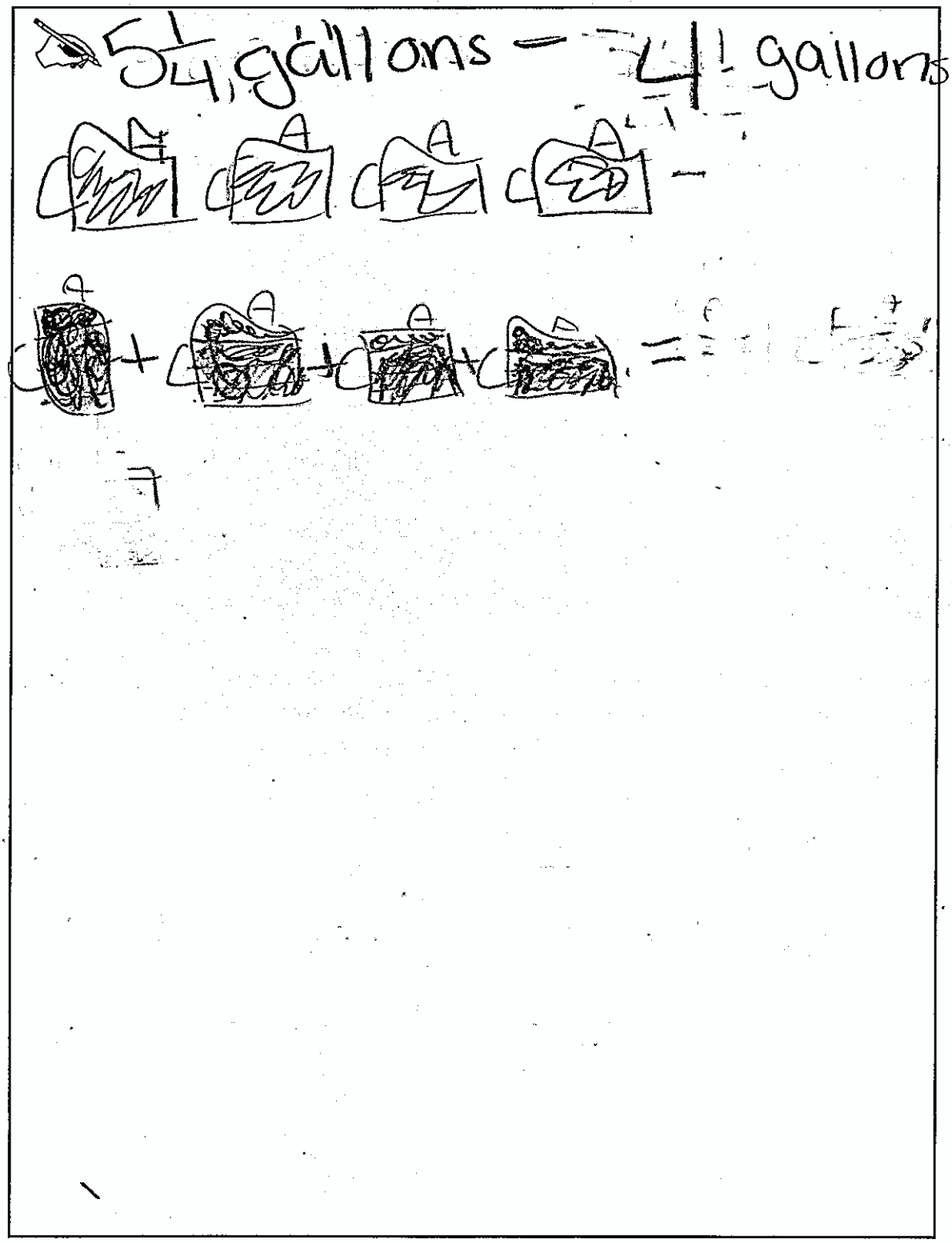
a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



Litho#: 457547

A-2b

b. Write one or more subtraction expressions that match your diagram.



Litho#: 457547

Anchor 2 Litho 457547

Total Content Points: 2 (4.NF.B.3a, 4.NF.B.3d)

Total Practice Points: 2 (MP1, MP4)

The student indicates an understanding of the addition of fractions by adding $\frac{3}{4}$ gallon 7 times to equal $5\frac{1}{4}$ (4.NF.B.3a). The student determines that 4 gallons is not enough to last through the week by producing a diagram and expressions showing that 7 days requires $5\frac{1}{4}$ gallons (4.NF.B.3d). The student indicates a correct solution path using a subtraction expression $\left(5\frac{1}{4} \text{ gallons } - \text{ 4 gallons}\right)$ based on the diagram for 7 days (MP1). The student models with a diagram and an equation to show that $\frac{3}{4}$ gallon of orange juice is being consumed each day (MP4).

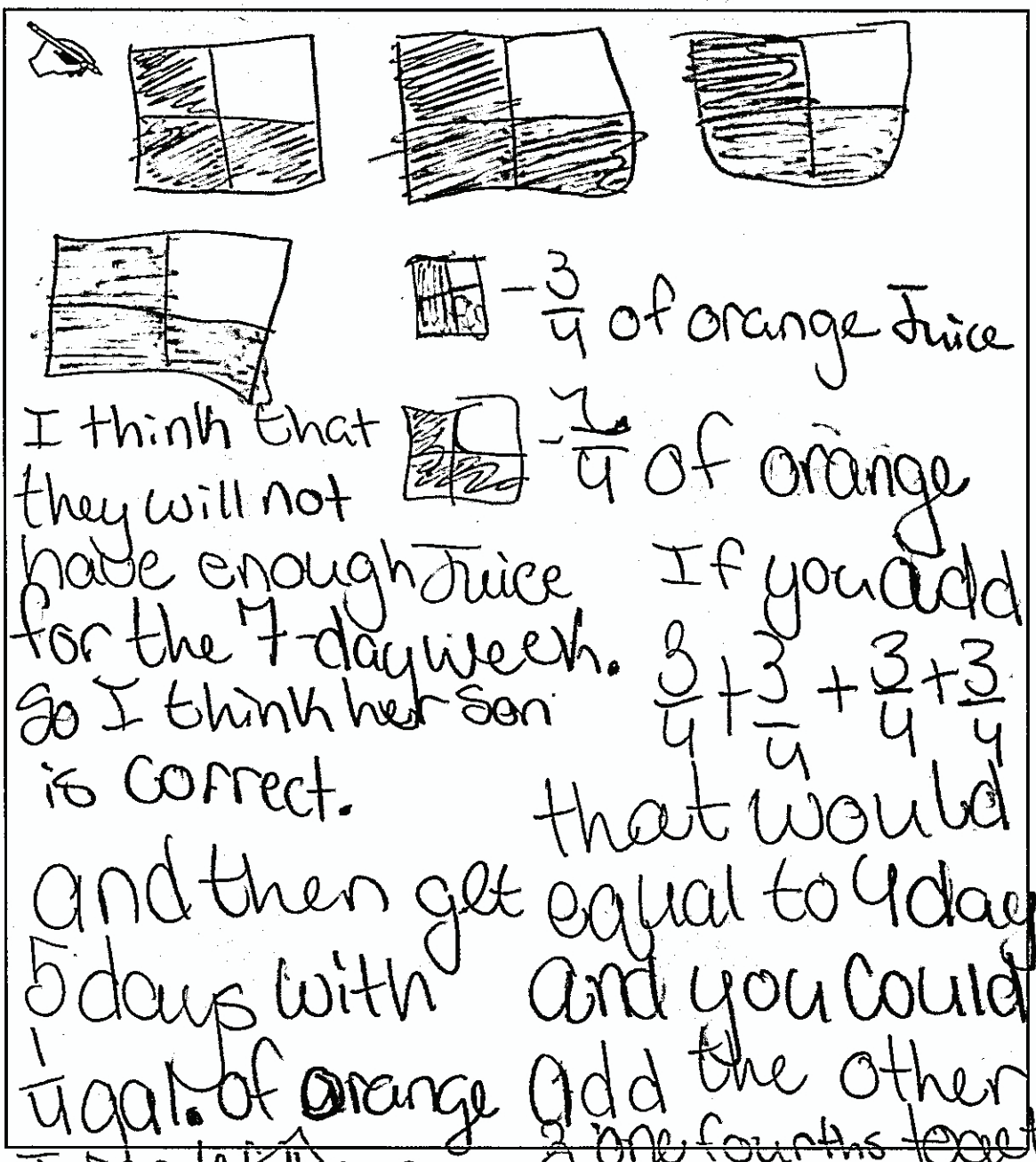
Total Awarded Points: 4 out of 4

Task 1. Orange Juice Task

A-3a

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



b. Write one or more subtraction expressions that match your diagram.

4 gal. $-\frac{3}{4}-\frac{3}{4}-\frac{3}{4}-\frac{3}{4}=$

only 4 days worth of orange juice.

Anchor 3 Litho 479759

Total Content Points: 2 (4.NF.B.3a, 4.NF.B.3d)

Total Practice Points: 2 (MP1, MP4)

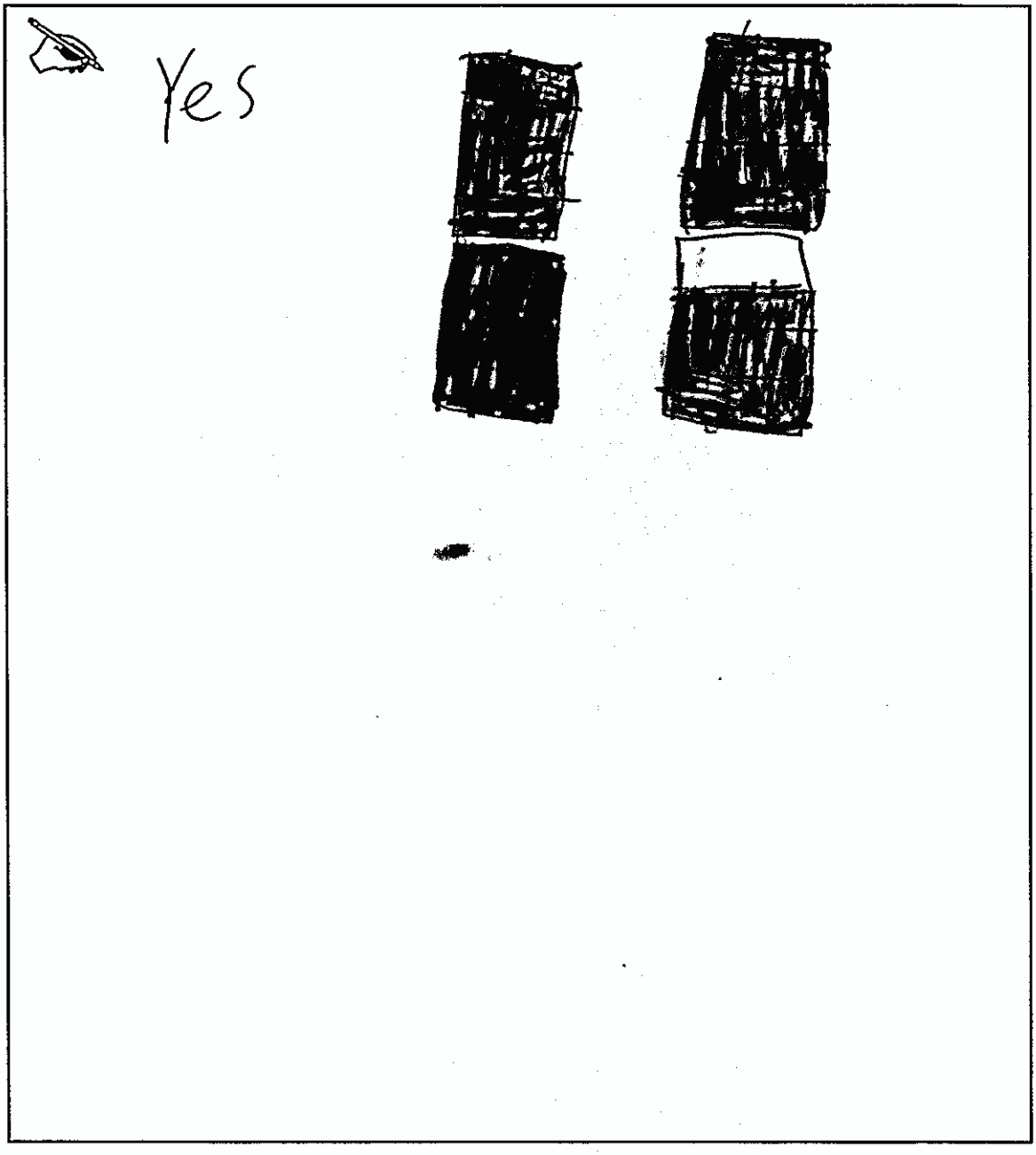
The student indicates an understanding of the addition of fractions by providing an expression $\left(\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}\right)$ in Part A that shows adding $\frac{3}{4}$ gallon to find the total amount consumed (4.NF.B.3a). The student determines that 4 gallons is not enough to last a whole week through a diagram and an explanation that the juice will only last 5 days, with $\frac{1}{4}$ gallon left over (4.NF.B.3d). The student indicates a correct solution path and uses a subtraction expression related to the context $\left(4 \text{ gal.}-\frac{3}{4}-\frac{3}{4}-\frac{3}{4}-\frac{3}{4}\right)$ in Part C to determine that Mrs. Martinez's son is correct (MP1). The student models with a correct diagram and an appropriate expression to show that $\frac{3}{4}$ gallon of orange juice is being consumed each day (MP4).

Total Awarded Points: 4 out of 4

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



A-4b

b. Write one or more subtraction expressions that match your diagram.

$4 - \frac{3}{4} = 3\frac{1}{4} - \frac{3}{4} = 2\frac{1}{2} - \frac{3}{4} = \frac{3}{4} - \frac{3}{4} = 1 - \frac{3}{4} - \frac{1}{4}$

no it will not last the entire week.

Litho#: 467459

Anchor 4 Litho 467459

Total Content Points: 2 (4.NF.B.3a, 4.NF.B.3d)

Total Practice Points: 1 (MP1)

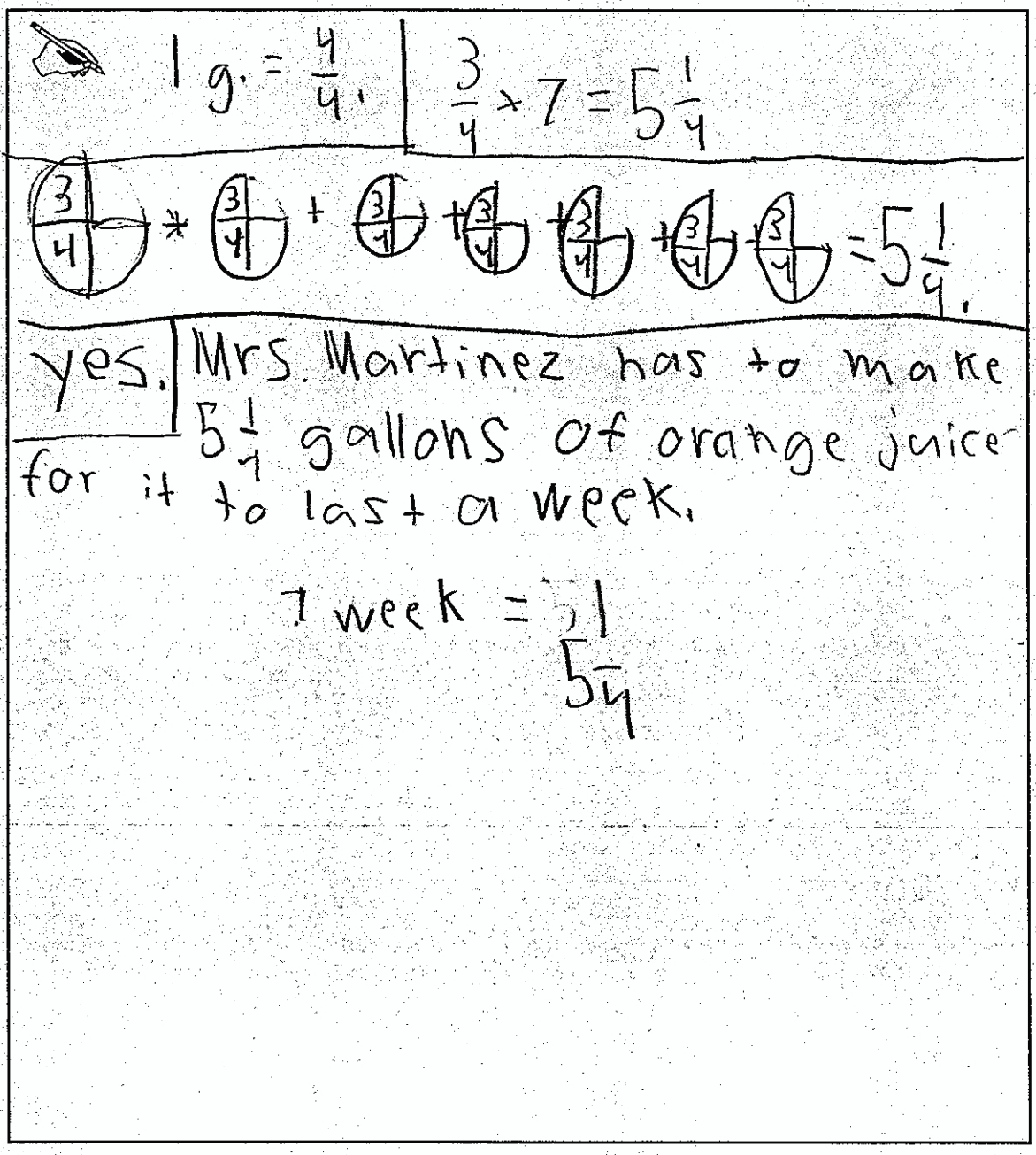
The student indicates an understanding of the subtraction of fractions in Part B by subtracting $\frac{3}{4}$ gallon from 4 gallons $\left(4-\frac{3}{4}=3\frac{1}{4}\right)$ (4.NF.B.3a). The student uses repeated subtraction of $\frac{3}{4}$ from 4 gallons in Part B to show that the family will not have enough juice $\left(4-\frac{3}{4}=3\frac{1}{4}-\frac{3}{4}=2\frac{1}{2}-\frac{3}{4}\ ...\right)$ (4.NF.B.3d). The student finds a correct solution path by using subtraction expressions to show that Mrs. Martinez's son is correct, concluding that "no it will not last the entire week" (MP1). While the expressions are appropriate, the diagram does not correctly model the consumption of $\frac{3}{4}$ gallon of orange juice per day (no credit for MP4).

Total Awarded Points: 3 out of 4

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



b. Write one or more subtraction expressions that match your diagram.

$5\frac{1}{4} - \frac{3}{4} = 4$ gallons.

Anchor 5 Litho 461109

Total Content Points: 2 (4.NF.B.3a, 4.NF.B.3d)

Total Practice Points: 1 (MP4)

The student indicates an understanding of the addition of fractions by adding $\frac{3}{4}$ gallon 7 times in Part A to find the total amount consumed in 7 days (4.NF.B.3a). The student determines that 4 gallons is not enough to last the whole week by using a multiplication equation $\left(\frac{3}{4} \times 7 = 5\frac{1}{4}\right)$ to show how much would be needed for 7 days (4.NF.B.3d). The student does indicate a correct solution path, but the subtraction expression in Part B is not correct (no credit for MP1). The student models with a diagram and an appropriate equation showing that $\frac{3}{4}$ gallon of orange juice is being consumed each day (MP4).

Total Awarded Points: 3 out of 4

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.

Litho#: 479460

b. Write one or more subtraction expressions that match your diagram.

$\frac{3}{4} \times 7 = 5\frac{1}{4} - 4 = 1\frac{1}{4}$ gallons less than they needed for a week.

Anchor 6 Litho 479460

Total Content Points: 1 (4.NF.B.3d)

Total Practice Points: 2 (MP1, MP4)

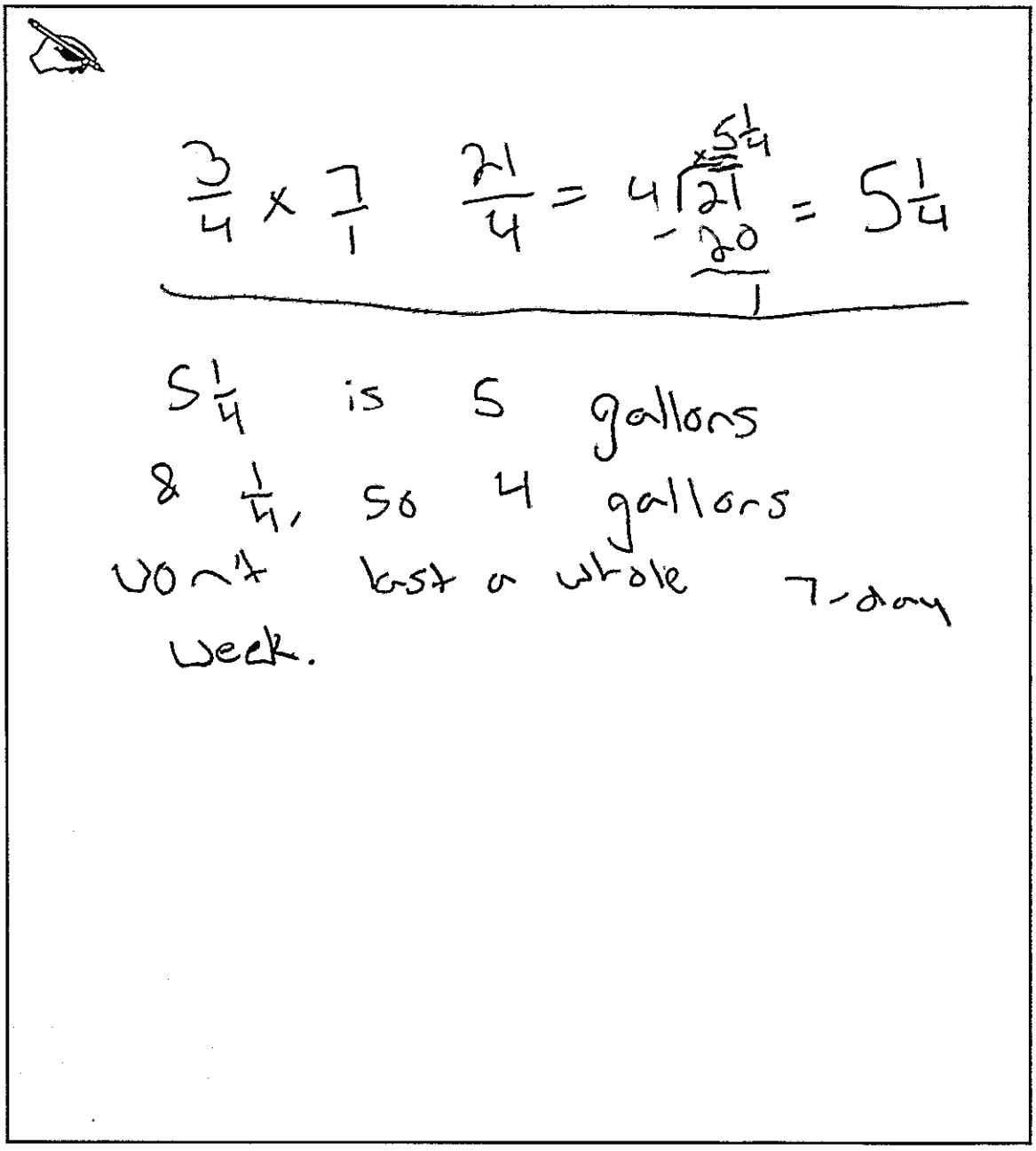
The student does not use addition or subtraction by $\frac{3}{4}$ to determine the total amount consumed (no credit for 4.NF.B.3a). The student determines that the 4 gallons is not enough to last the whole week through an equation $\left(\frac{7}{1}\times\frac{3}{4}=2\frac{1}{4}=5\frac{1}{4}\text{ for 7 days}\right)$ and a diagram illustrating the amount of orange juice consumed each day (4.NF.B.3d). The student indicates a correct solution path by providing a subtraction equation related to the diagram $\left(5\frac{1}{4}\text{g} - 4\text{ g} = 1\frac{1}{4}\text{g}\right)$ (MP1). The student models with a correct diagram and an appropriate equation to show that $\frac{3}{4}$ gallon of orange juice is being consumed each day (MP4).

Total Awarded Points: 3 out of 4

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



Litho#: 449802

b. Write one or more subtraction expressions that match your diagram.

$5\frac{1}{4} - 4 = 1\frac{1}{4}$, so they need 1 more gallon of juice

gallon of and $\frac{1}{4}$ juice.

Anchor 7 Litho 449802

Total Content Points: 1 (4.NF.B.3d)

Total Practice Points: 1 (MP1)

The student does not use addition or subtraction by $\frac{3}{4}$ to determine the total amount consumed (no credit for 4.NF.B.3a). The student determines that 4 gallons is not enough to last through the week by providing a multiplication equation $\left(\frac{3}{4}\times\frac{7}{1}=5\frac{1}{4}\right)$ to show how much juice is needed for 7 days (4.NF.B.3d). The student indicates a correct solution path by providing a subtraction equation $\left(5\frac{1}{4}-4=1\frac{1}{4}\right)$ that shows how much more orange juice would be needed (MP1). The student does not provide a diagram to model the consumption of $\frac{3}{4}$ gallon of orange juice per day (no credit for MP4).

Total Awarded Points: 2 out of 4

A-8a

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.

$\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = \frac{12}{4} = 3$ G.

4 day = 3 OR $\frac{3}{4} \times 4 =$ 3 whole Numer

Yes he is corret because there is 7 days in a week So if 4 days (=) 3 gallons then 7 day Will be way Past that because... $7 \times \frac{3}{4} = 5\frac{1}{4}$ gallon so it Would be over so she would have to get about 6 gallon of orange juce next time.

$5\frac{1}{4}$ = OOOOO

Litho#: 454185

b. Write one or more subtraction expressions that match your diagram.

4 Gallons

7 days in Week So

$\frac{3}{4} \times 7 = 5\frac{1}{4}$

$5\frac{1}{5} - 4 = 1\frac{1}{5}$

So, this means that Mrs. Martinez's Son is! Corret and She will have to buy more Next time.

Litho#: 454185

Anchor 8 Litho 454185

Total Content Points: 2 (4.NF.B.3a, 4.NF.B.3d)

Total Practice Points: 0

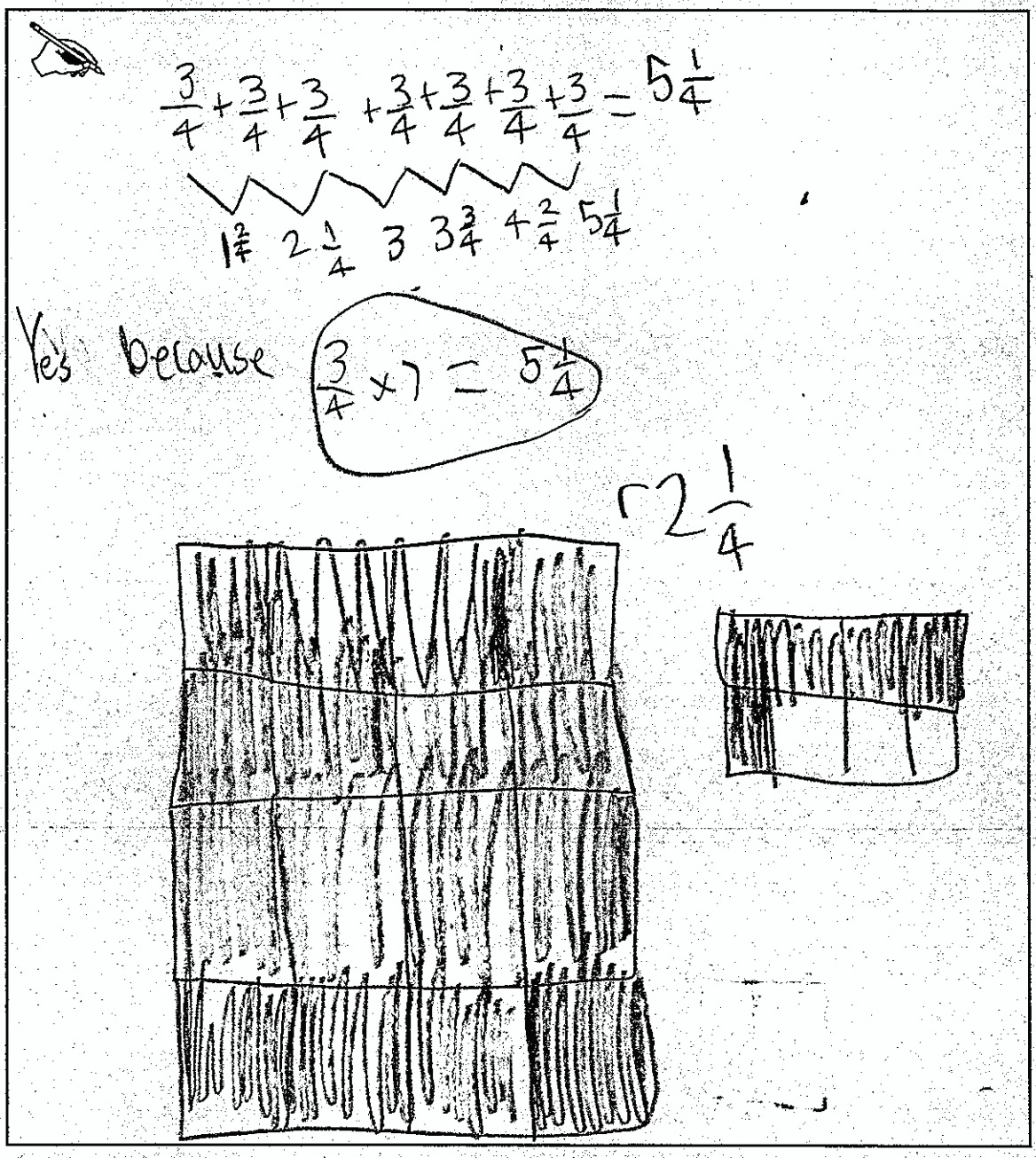
The student indicates an understanding of the addition of fractions by adding $\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}=\frac{12}{4}$ to find the amount of orange juice consumed (4.NF.B.3a). The student determines that 4 gallons is not enough to last through the week by using a multiplication equation $7\times\frac{3}{4}=5\frac{1}{4}$ to show how much orange juice is need for 7 days (4.NF.B.3d). The student does not indicate a correct solution path based on a comparison to 7 days, but rather shows that 3 gallons would be consumed in 4 days (no credit for MP1). The student does not model with a diagram to show that $\frac{3}{4}$ gallon of orange juice is being consumed each day (no credit for MP4).

Total Awarded Points: 2 out of 4

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



b. Write one or more subtraction expressions that match your diagram.

$5\frac{1}{4} - 1 = \frac{3}{4}$

$5\frac{1}{4} - 2 = 3\frac{1}{4} + \frac{3}{4} = 4$

Anchor 9 Litho 464495

Total Content Points: 2 (4.NF.B.3a, 4.NF.B.3d)

Total Practice Points: 0

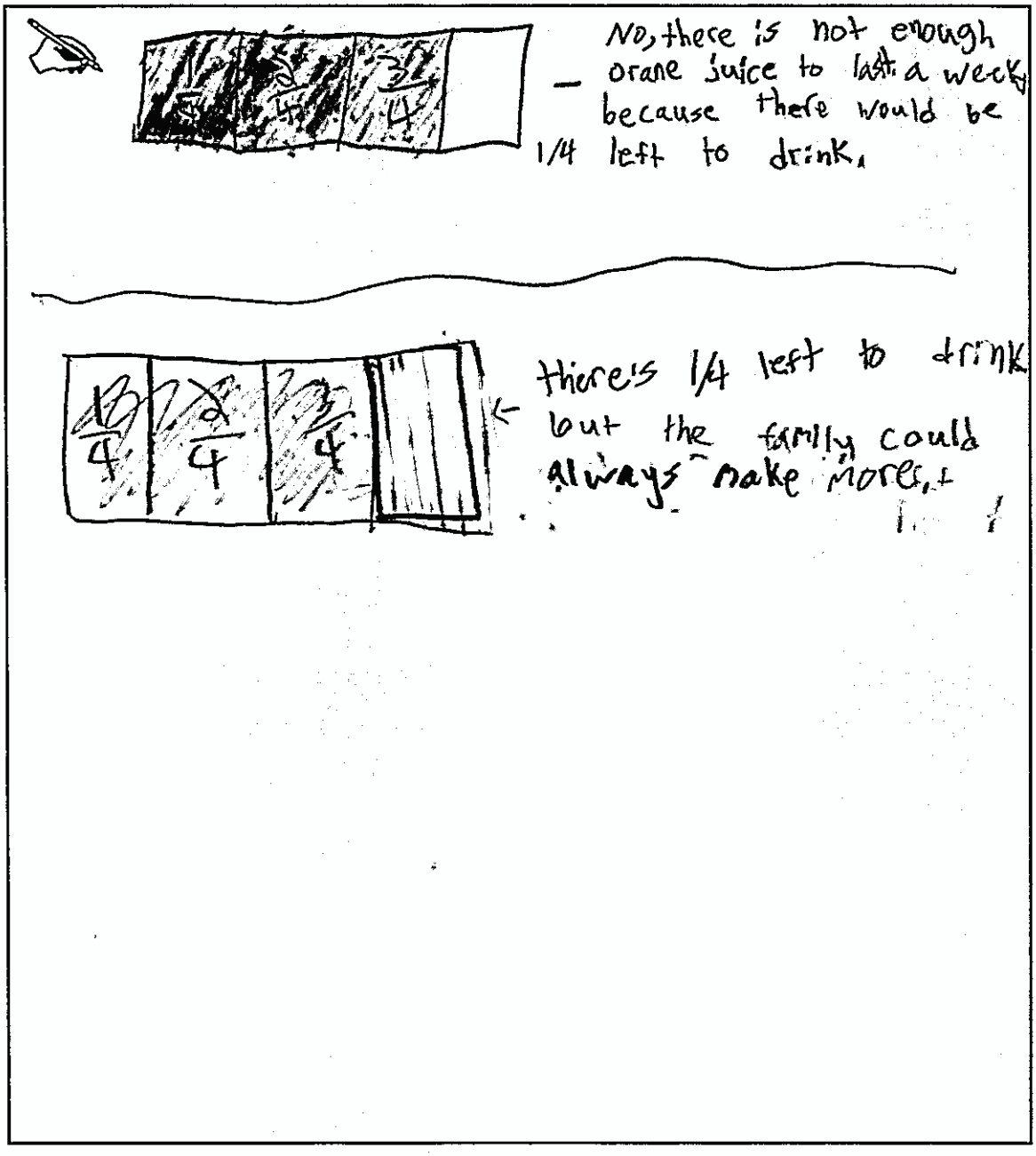
The student shows understanding of the addition of fractions through the equation $\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+...=5\frac{1}{4}$, used to find the amount of orange juice consumed (4.NF.B.3a). The student determines that 4 gallons is not enough for a whole week by using addition equations and a multiplication equation $\left(\frac{3}{4}\times 7=5\frac{1}{4}\right)$ to show how much orange juice is needed for 7 days (4.NF.B.3d). The student does indicate a correct solution path based on a comparison to 7 days, but does not include a correct subtraction equation related to the context (no credit for MP1). The diagram provided by the student does not clearly model the consumption of $\frac{3}{4}$ gallon of orange juice per day (no credit for MP4).

Total Awarded Points: 2 out of 4

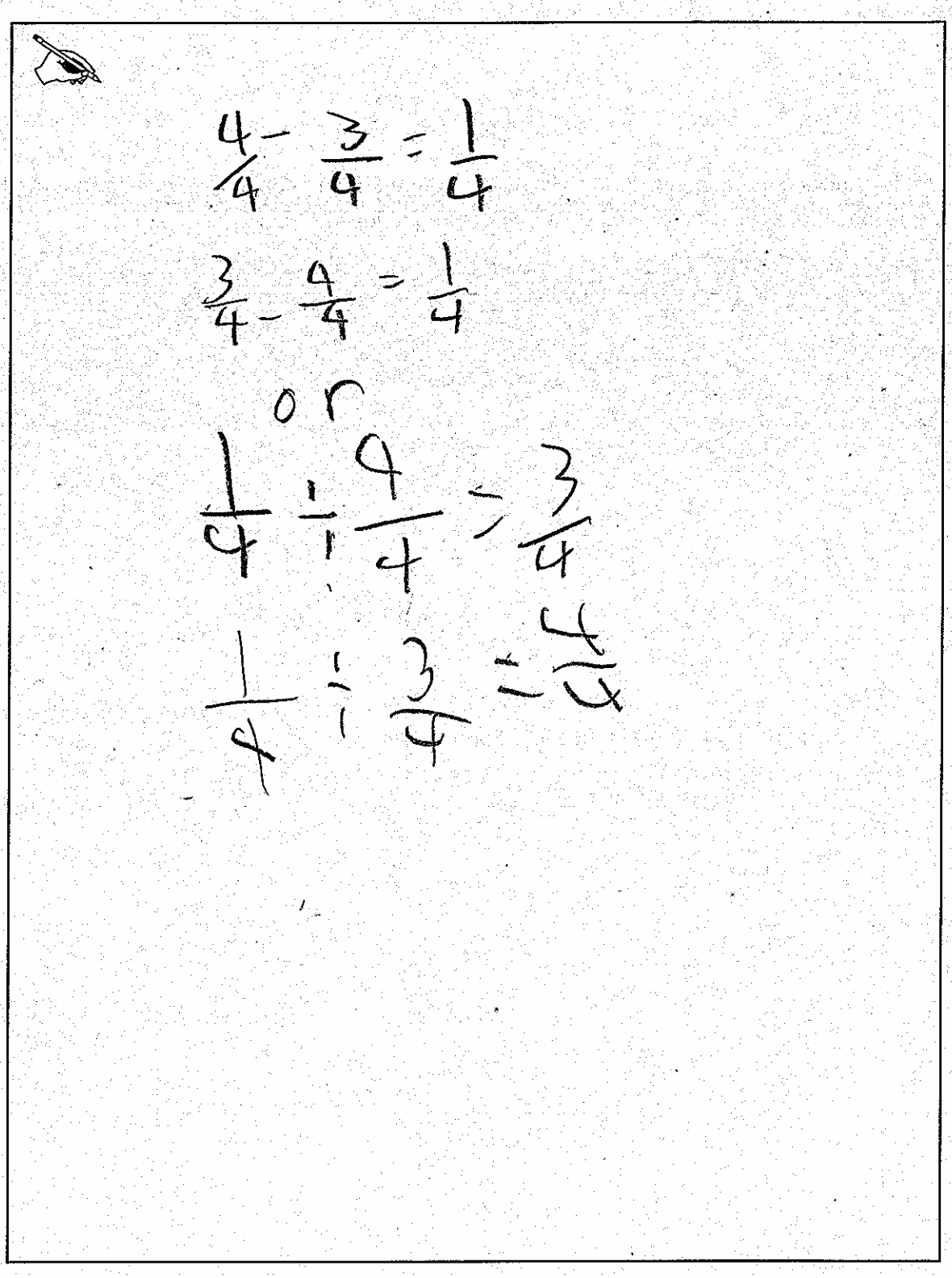
Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



b. Write one or more subtraction expressions that match your diagram.



Litho#: 450810

Anchor 10 Litho 450810

Total Content Points: 1 (4.NF.B.3a)

Total Practice Points: 0

The student indicates an understanding of subtraction of fractions by correctly subtracting $\frac{3}{4}$ gallon at least once $\left(\frac{4}{4}-\frac{3}{4}=\frac{1}{4}\right)$ (4.NF.B.3a). The student produces an incorrect diagram, an incorrect subtraction equation $\left(\frac{3}{4}-\frac{4}{4}=\frac{1}{4}\right)$, and incorrect division equations $\left(\frac{1}{4}\div\frac{4}{4}=\frac{3}{4},\ \frac{1}{4}\div\frac{3}{4}=\frac{4}{4}\right)$. Also, the student does not use any mathematical method to prove that the family will not have enough juice (no credit for 4.NF.B.3d). The student does not indicate a correct solution path based on a comparison to 7 days and does not provide correct subtraction equations related to the context (no credit for MP1). The student does not model with a diagram that shows that $\frac{3}{4}$ gallon of orange juice consumed each day (no credit for MP4).

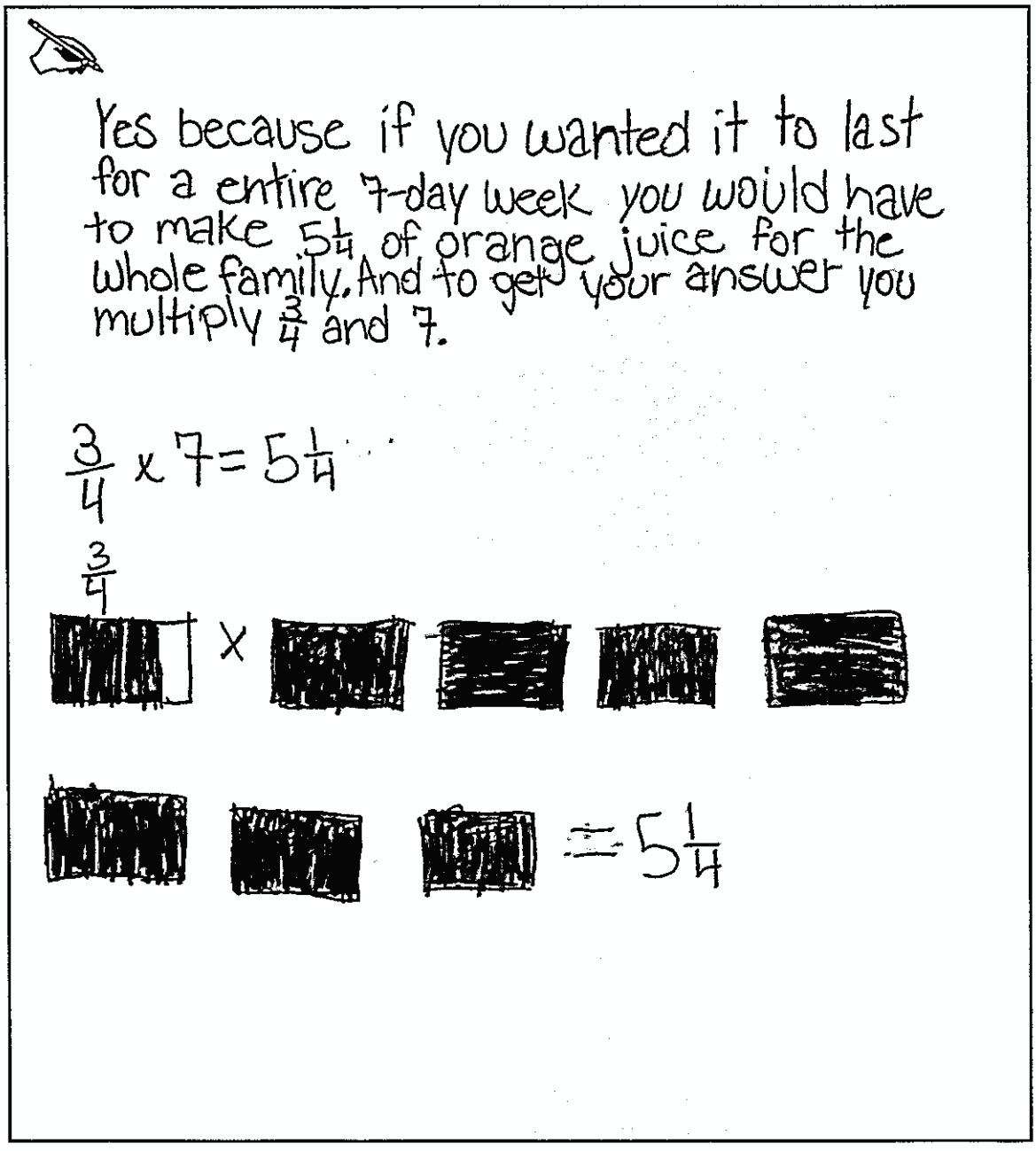
Total Awarded Points: 1 out of 4

A-11a

Task 1. Orange Juice Task

Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



Litho#: 449794

b. Write one or more subtraction expressions that match your diagram.

$7 - 5\frac{1}{4} = 1\frac{3}{4}$

Anchor 11 Litho 449794

Total Content Points: 1 (4.NF.B.3d)

Total Practice Points: 0

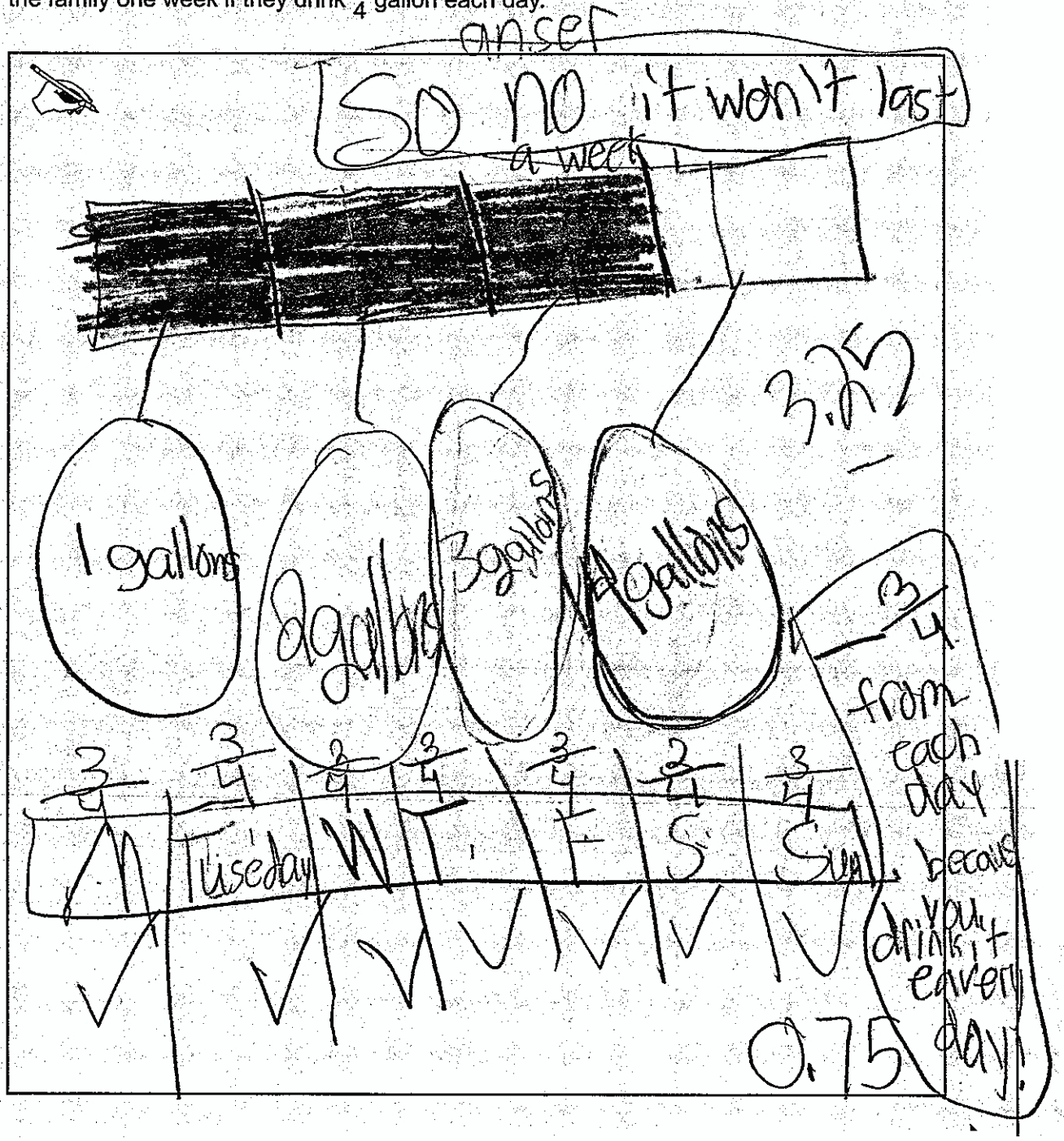
The student does not indicate an understanding of addition and subtraction of fractions, not using $\frac{3}{4}$ in an expression or equation showing the total consumption of orange juice (no credit for 4.NF.B.3a). The student determines that the 4 gallons is not enough to last through the week by correctly multiplying $\left(\frac{3}{4} \times 7 = 5\frac{1}{4}\right)$ to show how much juice is needed for 7 days (4.NF.B.3d). The student does not indicate a correct solution path based on a comparison to 7 days (no credit for MP1). The diagram provided does not correctly model the consumption of $\frac{3}{4}$ gallon of orange juice each day (no credit for MP4).

Total Awarded Points: 1 out of 4

Task 1. Orange Juice Task

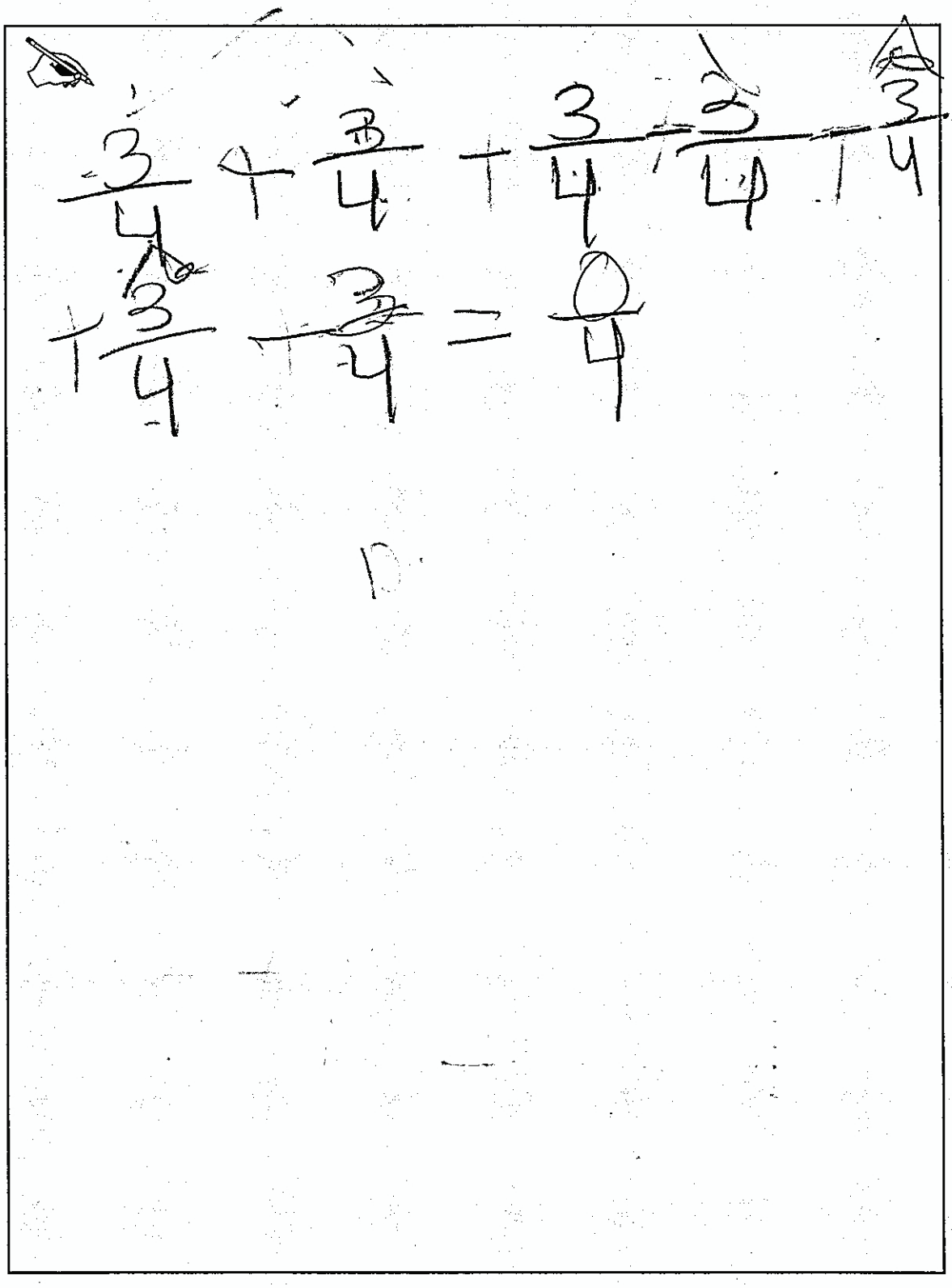
Mrs. Martinez made 4 gallons of fresh orange juice for her family on Sunday. Knowing that the family drinks $\frac{3}{4}$ gallon of orange juice every day, her son claims that the orange juice will not last the entire 7-day week.

a. Is Mrs. Martinez's son correct? Draw a diagram to show whether 4 gallons is enough to last the family one week if they drink $\frac{3}{4}$ gallon each day.



Litho#: 465491

b. Write one or more subtraction expressions that match your diagram.



Anchor 12 Litho 465491

Total Content Points: 0

Total Practice Points: 0

The student does not indicate an understanding of addition and subtraction of fractions, neither subtracting nor adding $\frac{3}{4}$ gallon correctly to find the total amount of orange juice consumed. The equation in Part B is incorrect $\left(\frac{3}{4}+\frac{3}{4}-\frac{3}{4}-\frac{3}{4}...=\frac{0}{4}\right)$ (no credit for 4.NF.B.3a). The student does not use either a diagram, repeated subtraction, or a multiplication equation to determine that the 4 gallons is not enough to last a whole week (no credit for 4.NF.B.3d). The student's work does not indicate a correct solution path (no credit for MP1). The diagram and equation provided do not correctly model the consumption of $\frac{3}{4}$ gallon of juice per day (no credit for MP4).

Total Awarded Points: 0 out of 0