

SECURE MATERIAL - Reader Name: _____
Tennessee Comprehensive Assessment Program

TCAP/CRA

2014



4

Phase III

Paint By Number Task

Anchor Set

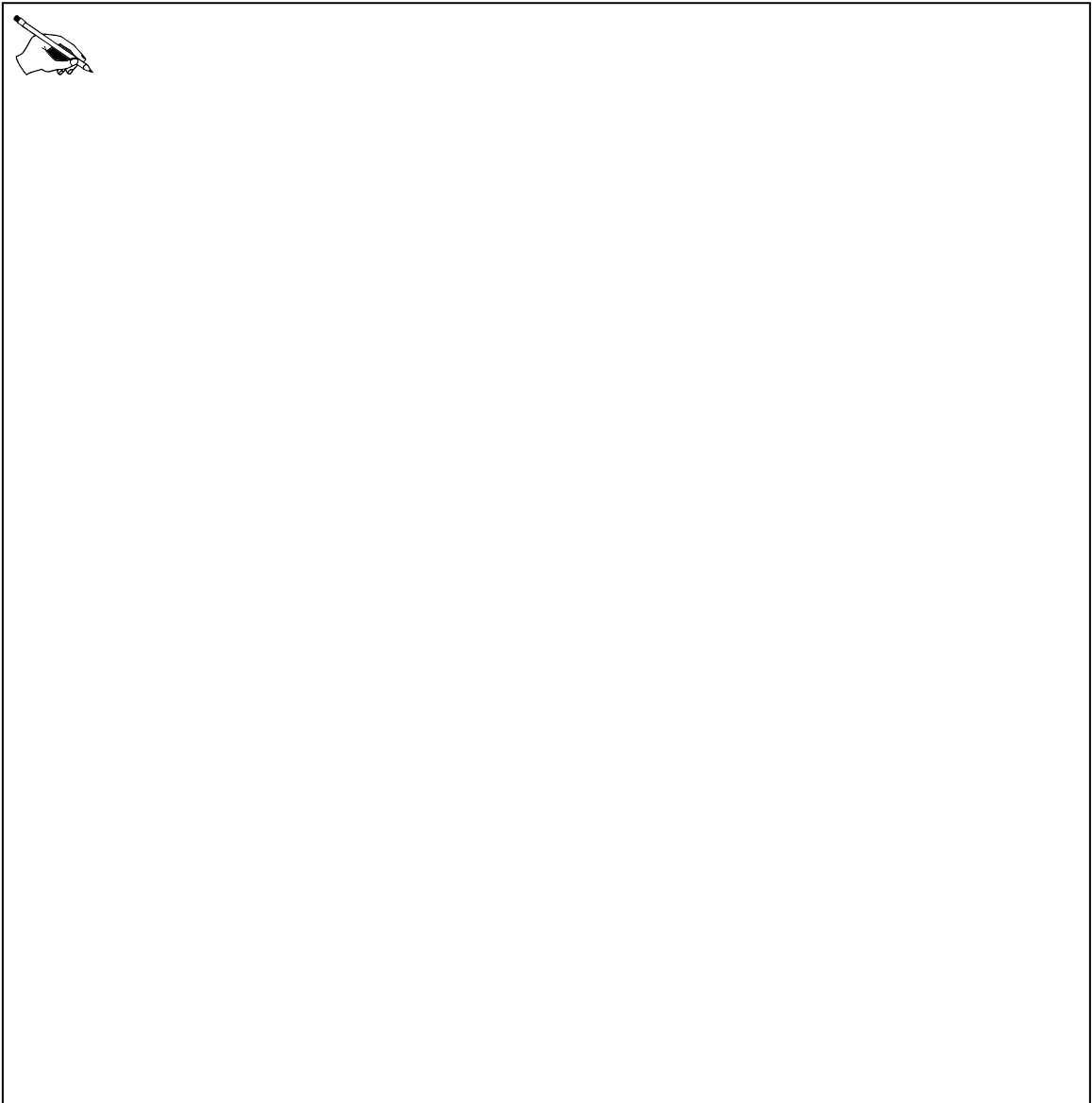
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Grade 4 — 2013–14, Phase III
Part 2: Constructed Response Task Section

Paint by Numbers Task

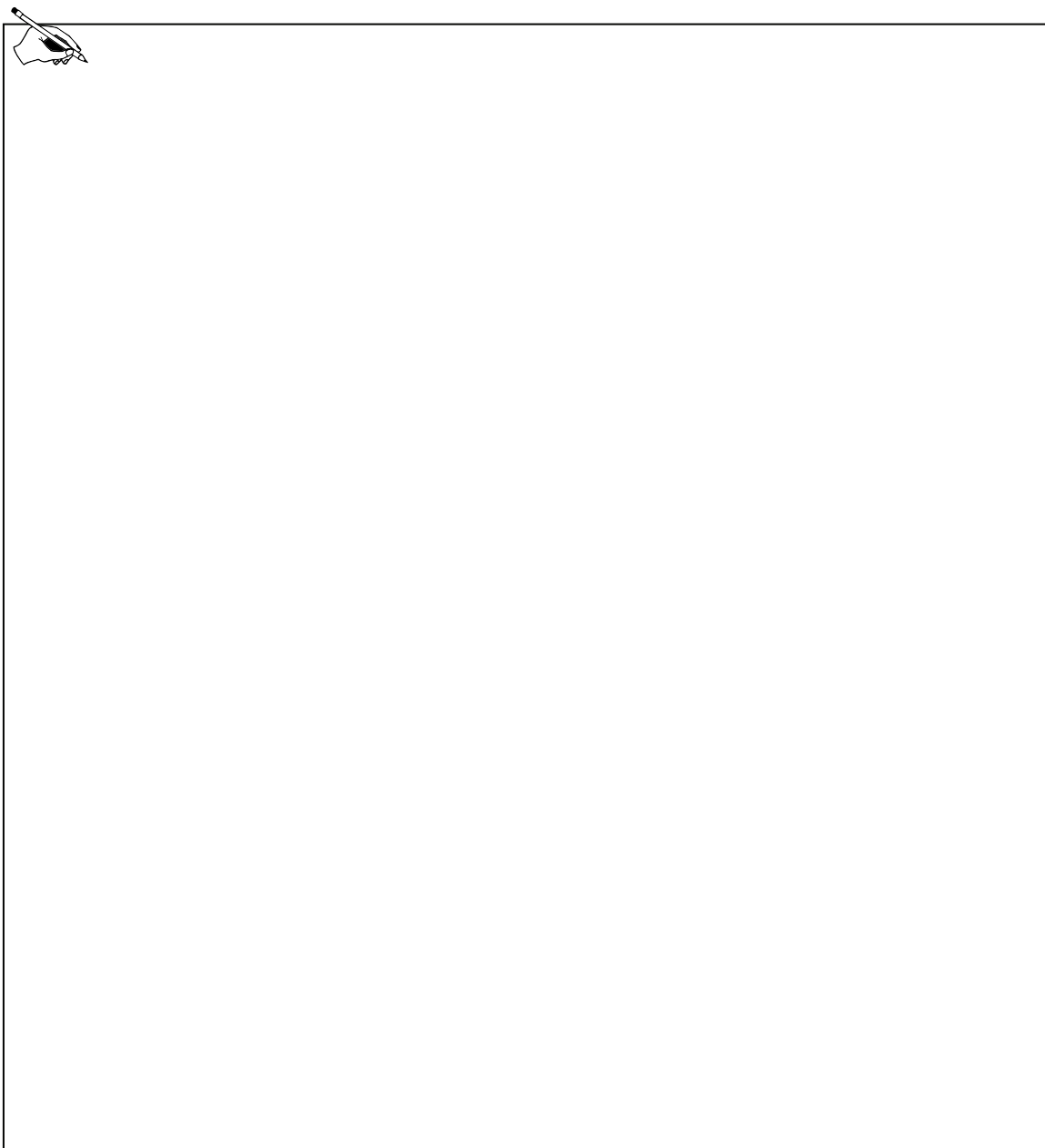
The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.



Paint by Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



Scoring Guide

The CCSS for Mathematical Content (2 points)

4.NF.B.3d(x) Identifies the answer in part a as $\frac{4}{5}$. _____
(1 Point)

4.NF.B.3d(z) Finds the fraction of the fence Sandy painted as $\frac{2}{5}$. _____
(1 Point)

The CCSS for Mathematical Practice (2 points)

MP4(x) Represents the fraction of the fence painted in the morning as an addition
($\frac{1}{5} + \frac{4}{5} = \frac{5}{5}$) or subtraction ($1 - \frac{1}{5} = \frac{4}{5}$) expression or equation in part a. _____
(1 point)
(MP4: Model with mathematics.)

MP4(z) Represents the situation with an accurate visual model in part a. _____
(1 Point)
(MP4: Model with mathematics.)

TOTAL POINTS: 4

The CCSS for Mathematical Content Addressed In This Task

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

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.
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The CCSS for Mathematical Practice*

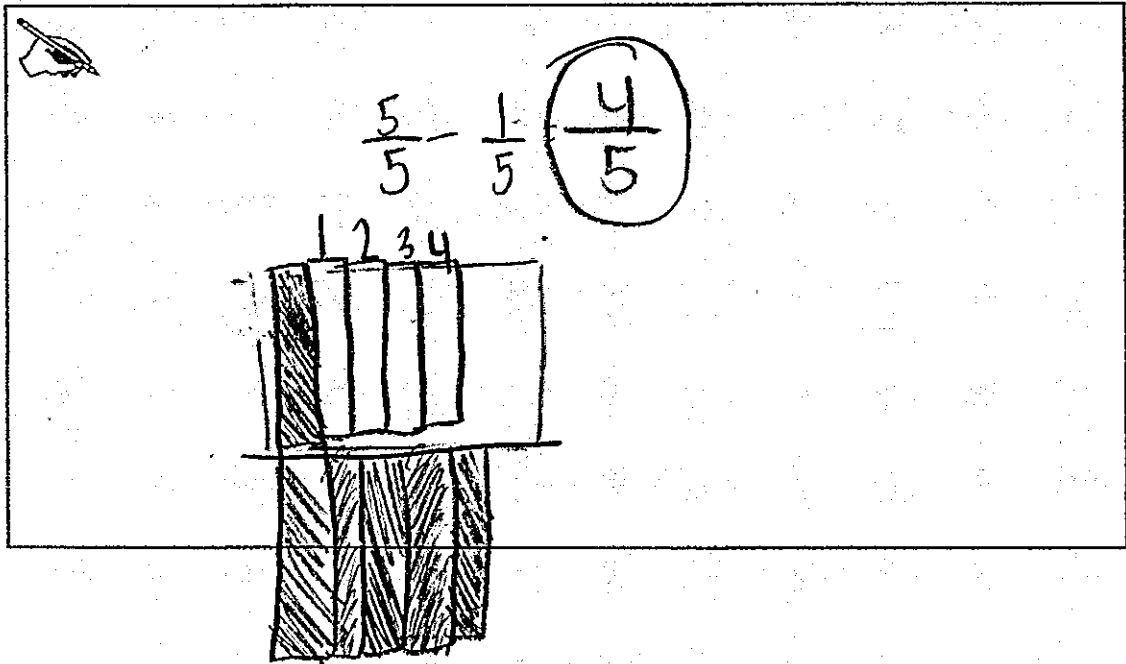
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. **Model with mathematics.**
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8.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

* Gray type indicates Mathematical Practices not addressed in this assessment.

Paint By Numbers Task

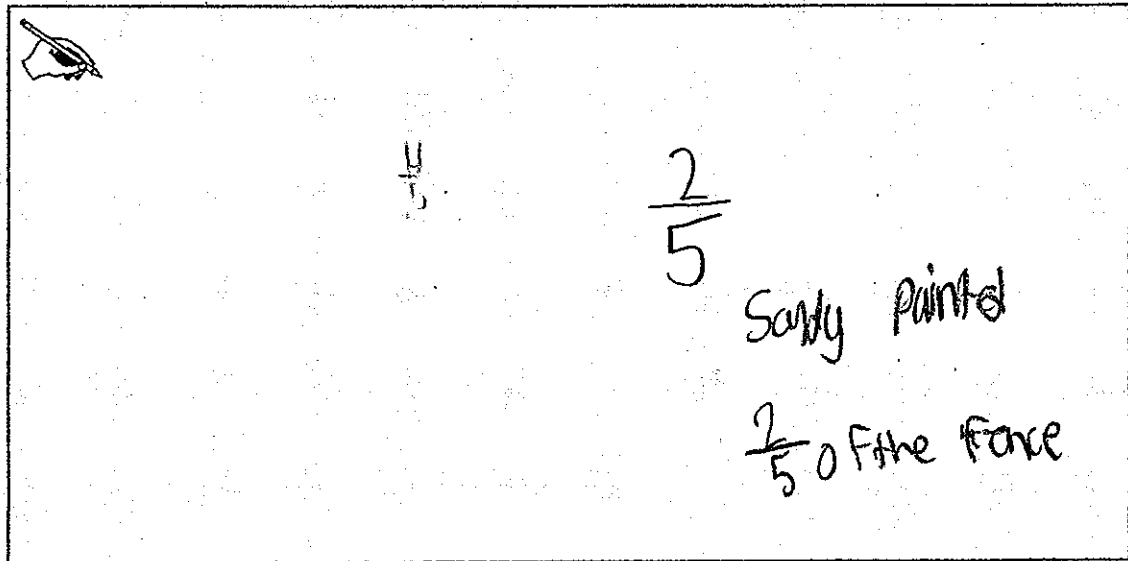
The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.



Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



$\frac{2}{5}$

$\frac{2}{5}$ Sandy painted $\frac{2}{5}$ of the fence



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 1

Litho 00044200171

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

Total Practice Points: 2 (MP4(x), MP4(z))

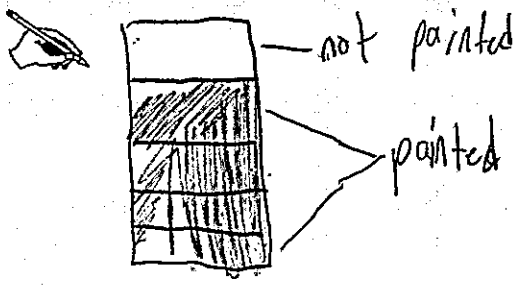
The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student finds the fraction $\frac{2}{5}$ as the portion of the fence that Sandy painted (4.NF.B.3d(z)). The student represents the fraction of the fence painted as a subtraction equation $\left(\frac{5}{5} - \frac{1}{5} = \frac{4}{5}\right)$ in Part A (MP4(x)). The student also uses shading with a visual model to represent the $\frac{4}{5}$ of the fence has been painted and the $\frac{1}{5}$ of the fence that still needs to be painted (MP4(z)).

Total Awarded Points: 4 out of 4

Paint By Numbers Task

The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.



not painted

painted

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

Lani and Sandy

$\frac{4}{5}$ in the morning

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

Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



$$\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$$

They painted $\frac{4}{5}$ all together. Next

$\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$. Sandi paint $\frac{2}{5}$ of the fence.



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 2

Litho 00154200171

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

Total Practice Points: 2 (MP4(x), MP4(z))

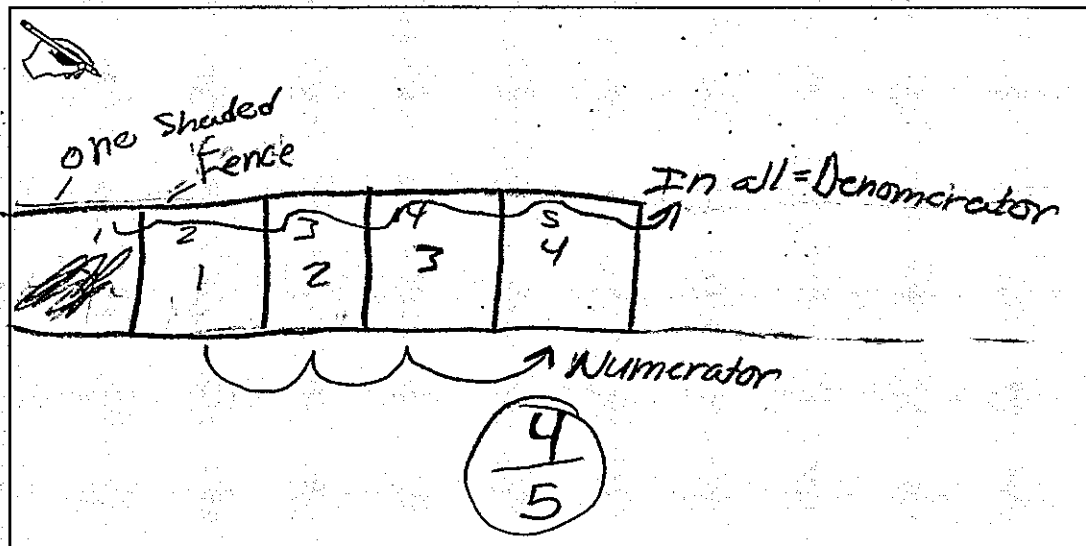
The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student finds the fraction $\frac{2}{5}$ as the portion of the fence that Sandy painted (4.NF.B.3d(z)). The student represents the fraction of the fence painted as a subtraction equation $\left(\frac{5}{5} - \frac{1}{5} = \frac{4}{5}\right)$ in Part A (MP4(x)). The student also shades a visual model divided into five equal parts to represent that $\frac{4}{5}$ of the fence was painted and $\frac{1}{5}$ of the fence remains (MP4(z)).

Total Awarded Points: 4 out of 4

Paint By Numbers Task

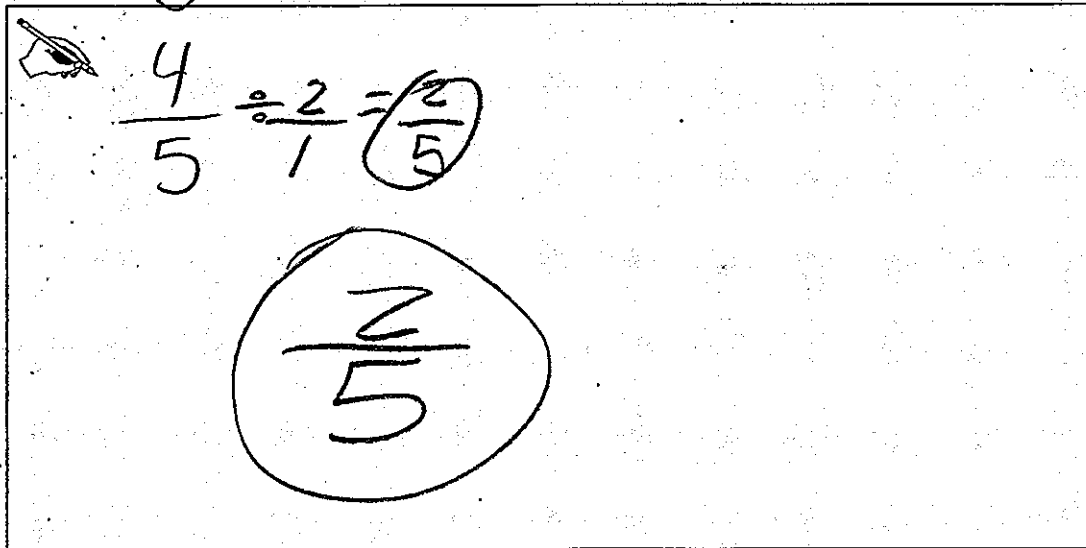
The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a: What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.



Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



Handwritten work showing the calculation of the amount of fence painted by Sandy:

$$\frac{4}{5} \div \frac{2}{1} = \frac{2}{5}$$

The final answer, $\frac{2}{5}$, is circled.



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 3

Litho 00194200175

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

Total Practice Points: 1 (MP4(z))

The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student finds the fraction $\frac{2}{5}$ as the portion of the fence that Sandy painted (4.NF.B.3d(z)). The student does not use an equation or expression to find the answer in Part A (no credit for MP4(x)). In Part A, the student uses and explains a visual model to represent that $\frac{1}{5}$ of the fence still needs to be painted and that the remaining $\frac{4}{5}$ of the fence has been painted (MP4(z)).

Total Awarded Points: 3 out of 4

Paint By Numbers Task

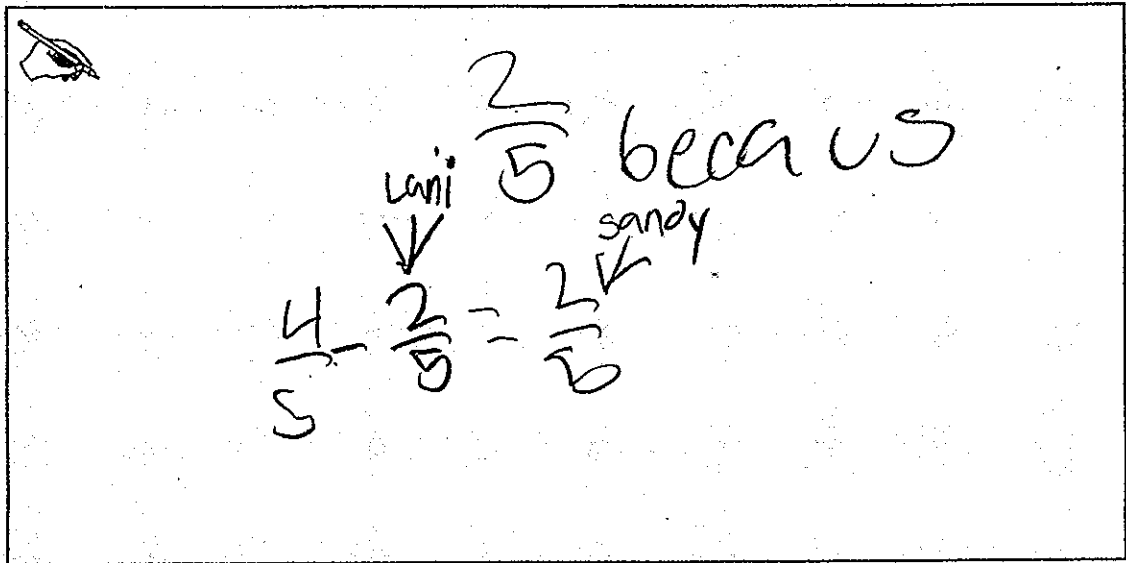
The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.

The diagram shows a rectangular fence with a wavy line representing a section that has been painted. A bracket above the painted section is labeled $\frac{4}{5}$. A bracket below the unpainted section is labeled "left". A question mark is drawn below the unpainted section. To the right of the diagram is the equation $\frac{4}{5} - \frac{1}{5} = \frac{4}{5}$, where the result $\frac{4}{5}$ is circled.

Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



Handwritten work showing a subtraction problem:

$$\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$$

The result $\frac{2}{5}$ is labeled "sandy" with an arrow pointing to it. Above the $\frac{2}{5}$ result, "Lani" is written with a downward arrow pointing to the $\frac{2}{5}$ term in the subtraction. To the right of the $\frac{2}{5}$ result, the word "because" is written.



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 4 Litho 00104200171
Total Content Points: 2 (4.NF.B.3d(x), 4.NF.B.3d(z))
Total Practice Points: 1 (MP4(x))


The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student finds the fraction $\frac{2}{5}$ as the portion of the fence that Sandy painted (4.NF.B.3d(z)). The student represents the fraction of the fence painted as a subtraction equation $\left(\frac{5}{5} - \frac{1}{5} = \frac{4}{5}\right)$ in Part A (MP4(x)). The student attempts to represent the situation with a visual model, but the model is not sufficiently clear to accurately represent the situation, and is not explained (no credit for MP4(z)).

Total Awarded Points: 3 out of 4

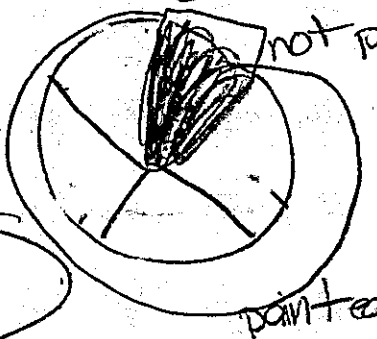
Paint By Numbers Task

The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.

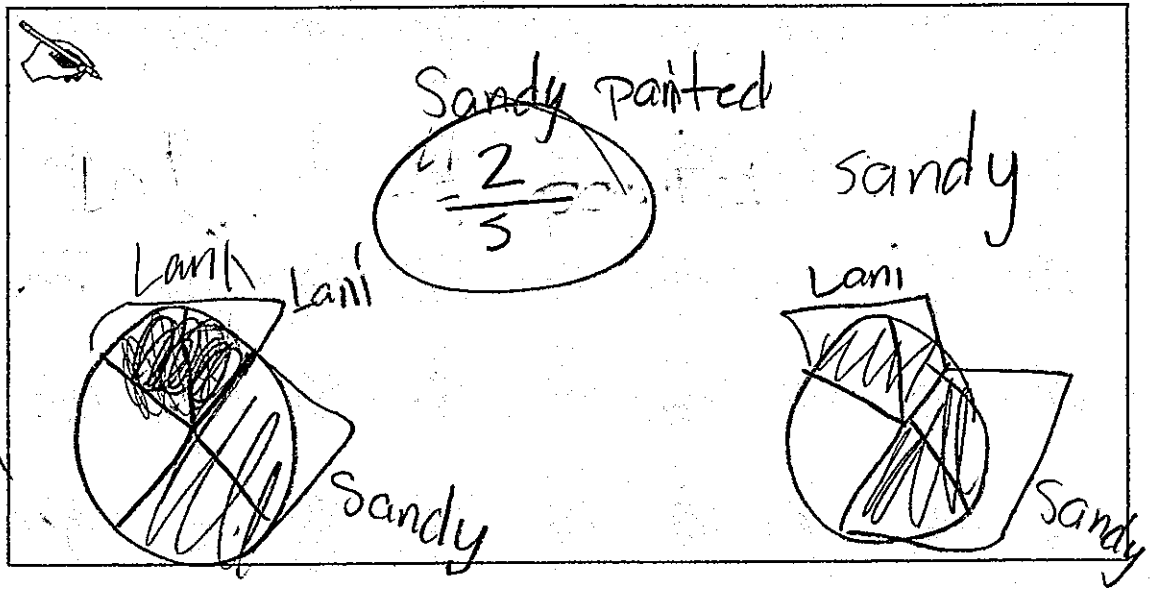
 There is $\frac{1}{5}$ of the fence ^{not} done
But what is painted

There is $\frac{4}{5}$ painted



Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



REVIEW YOUR WORK IF YOU HAVE TIME.

Anchor 5 Litho 00534200171
Total Content Points: 2 (4.NF.B.3d(x), 4.NF.B.3d(z))
Total Practice Points: 1 (MP4(z))

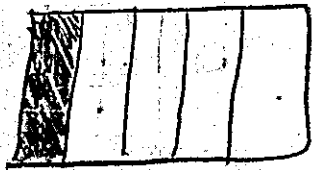
The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student finds the fraction $\frac{2}{5}$ as the portion of the fence that Sandy painted (4.NF.B.3d(z)). The student does not show the equation or expression used to find the answer in Part A (no credit for MP4(x)). In Part A, the student uses shading with a pie-shaped visual model to represent that $\frac{1}{5}$ of the fence still remains to be painted (MP4(z)).

Total Awarded Points: 3 out of 4

Paint By Numbers Task

The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.



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


$\frac{4}{5}$ equals

$\frac{4}{5}$

The diagram shows a rectangular fence divided into five equal vertical sections. The leftmost section is shaded with diagonal lines, representing the portion of the fence that has been painted. The remaining four sections are unshaded, representing the portion that remains to be painted.

Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?


$$\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$$



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 6

Litho 00334200171

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

Total Practice Points: 1 (MP4(z))

The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student finds the fraction $\frac{2}{5}$ as the portion of the fence that Sandy painted (4.NF.B.3d(z)). The student uses an incorrect multiplication equation, not a subtraction or addition equation, to represent $\frac{4}{5}$ in Part A (no credit for MP4(x)). In Part A, the student uses shading with a visual model to represent that $\frac{1}{5}$ of the fence still needs to be painted. The drawing represents the context, even though it is not labeled or explained (MP4(z)).

Total Awarded Points: 3 out of 4

Paint By Numbers Task

The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.

The student's work is enclosed in a rectangular box. In the top left corner, there is a small drawing of a hand holding a paintbrush. To its right, the fraction $\frac{1}{5}$ is written. Below this, the equation $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$ is written, with the word "ans" written vertically below it. To the right of the equation is a hand-drawn diagram of a rectangular fence with a wavy border. The top side of the fence is labeled with $\frac{1}{5}$, and the right side is labeled with $\frac{2}{5}$. To the right of the diagram, the text "They had painted $\frac{4}{5}$ of the fence." is written.

Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?

A hand-drawn diagram of a fence with a paint bucket. The fence is divided into five equal sections. The top two sections are shaded and labeled "Lani". The bottom three sections are unshaded and labeled "Sandy". A paint bucket is shown next to the fence.

Handwritten work showing the calculation:

$$\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$$

⇒ Sandy painted $\frac{2}{5}$ of the paint with $\frac{1}{5}$ left over to be painted.



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 7

Litho 00244200171

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

Total Practice Points: 0


The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student finds the fraction $\frac{2}{5}$ as the portion of the fence that Sandy painted (4.NF.B.3d(z)). The student uses the equation $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$ instead of $\frac{1}{5} + \frac{4}{5} = \frac{5}{5}$ to represent the fraction of the fence painted in the morning, and therefore does not represent the whole situation (no credit for MP4(x)). In Part A, the student attempts to represent the situation with a visual model, but does not use labeling or shading accurately (no credit for MP4(z)).


Total Awarded Points: 2 out of 4

Paint By Numbers Task

The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

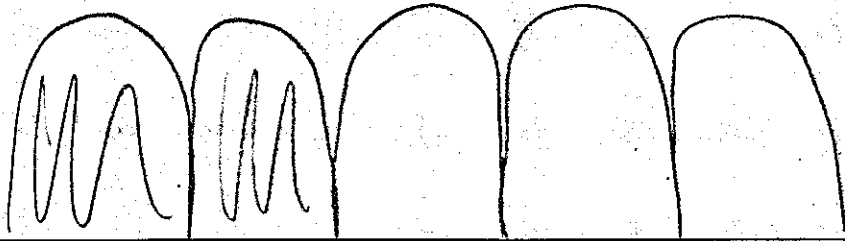
- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.

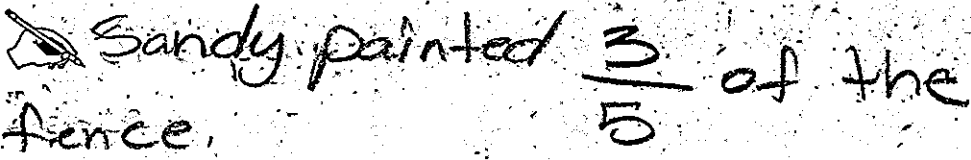
 They had painted $\frac{4}{5}$ of the fence.

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


Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?

A hand-drawn fence consisting of five sections. The first two sections are filled with vertical lines, representing the portion painted by Lani. The remaining three sections are empty, representing the portion painted by Sandy.

Sandy painted $\frac{3}{5}$ of the fence.



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 8

Litho 00104200175

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

Total Practice Points: 1 (MP4(z))

The student identifies the answer in Part A as $\frac{4}{5}$ (4.NF.B.3d(x)). In Part B, the student

incorrectly finds that Sandy painted $\frac{3}{5}$ of the fence, not $\frac{2}{5}$ (no credit for 4.NF.B.3d(z)). In

Part A, the student uses the addition equation $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$ instead of $\frac{1}{5} + \frac{4}{5} = \frac{5}{5}$ to represent the

fraction of the fence painted in the morning, and therefore does not accurately represent the whole fence (no credit for MP4(z)). The student represents the situation in Part A with an

accurate visual model showing that $\frac{4}{5}$ of the fence was painted and $\frac{1}{5}$ remains to be painted

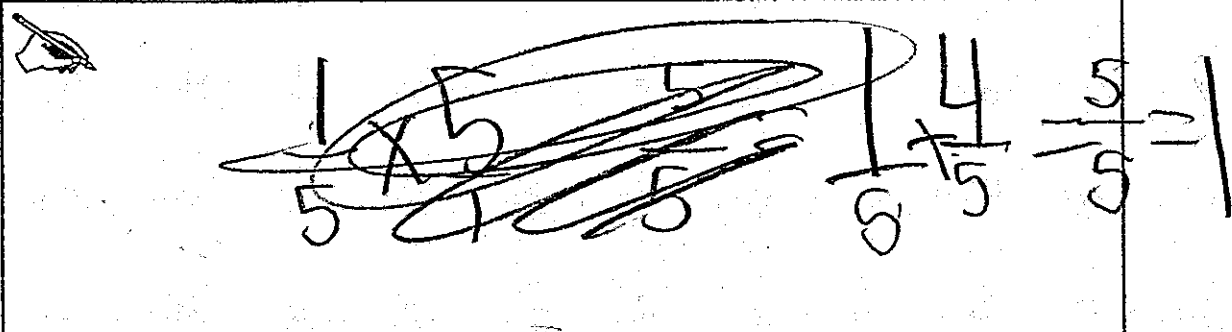
(MP4(z)).

Total Awarded Points: 2 out of 4

Paint By Numbers Task

The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.

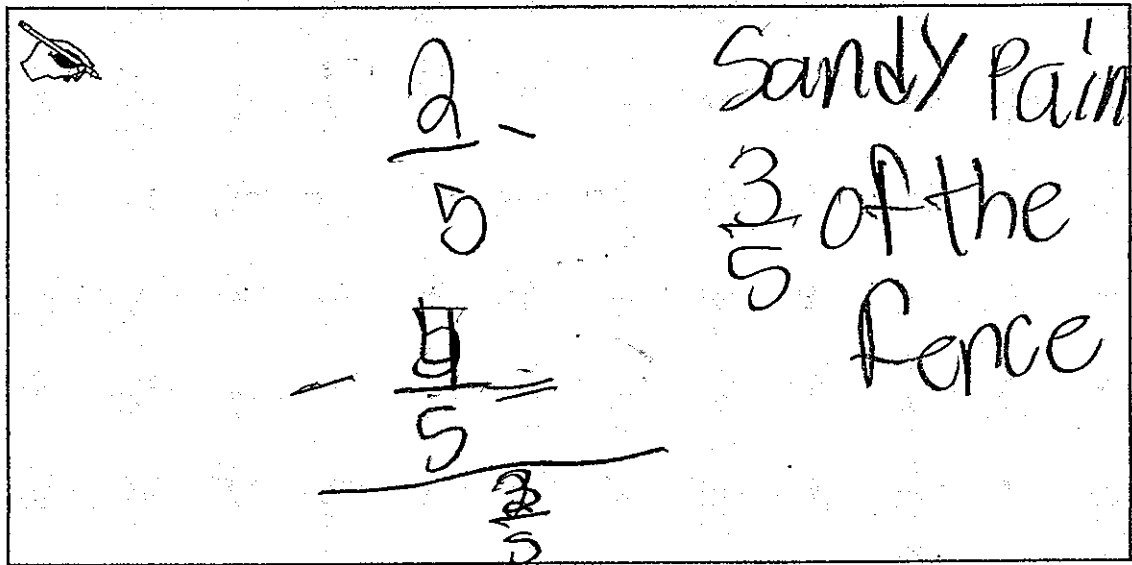


The diagram shows a rectangular fence with a pencil icon in the top left corner. The fence is divided into five equal sections. The first section is crossed out with a large 'X'. To the right of the fence, the equation $\frac{1}{5} + \frac{4}{5} = 1$ is written. The first $\frac{1}{5}$ is crossed out with a large 'X', and the $\frac{4}{5}$ is written above it. Below the crossed-out equation, the equation $\frac{4}{5} = 1 - \frac{1}{5}$ is written.

They have $\frac{4}{5}$ left to
paint

Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



The student's work is contained within a rectangular box. In the top-left corner of the box is a small drawing of an eye. The main part of the work consists of a vertical subtraction problem:

$$\begin{array}{r} 2 \\ 5 \\ - 1 \\ \hline 1 \\ 5 \end{array}$$

To the right of the subtraction problem, the student has written the answer in cursive: "Sandy Painted $\frac{3}{5}$ of the fence".



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 9

Litho 00514200171

Total Content Points: 0

Total Practice Points: 1 (MP4(x))


The student identifies that $\frac{4}{5}$ was left to paint, not that $\frac{4}{5}$ was already painted (no credit for 4.NF.B.3d(x)). In Part B, the student finds that Sandy painted $\frac{3}{5}$ of the fence, not $\frac{2}{5}$ (no credit for 4.NF.B.3d(z)). In Part A, the student uses the addition equation $\frac{1}{5} + \frac{4}{5} = \frac{5}{5} = 1$ to represent the fraction of the fence painted, which is a correct model of the situation, even though the student has confused the fraction of the fence that has been painted with the fraction not painted (MP4(x)). The student does not use a visual model to represent the situation in Part A (no credit for MP4(z)).

Total Awarded Points: 1 out of 4

Paint By Numbers Task

The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

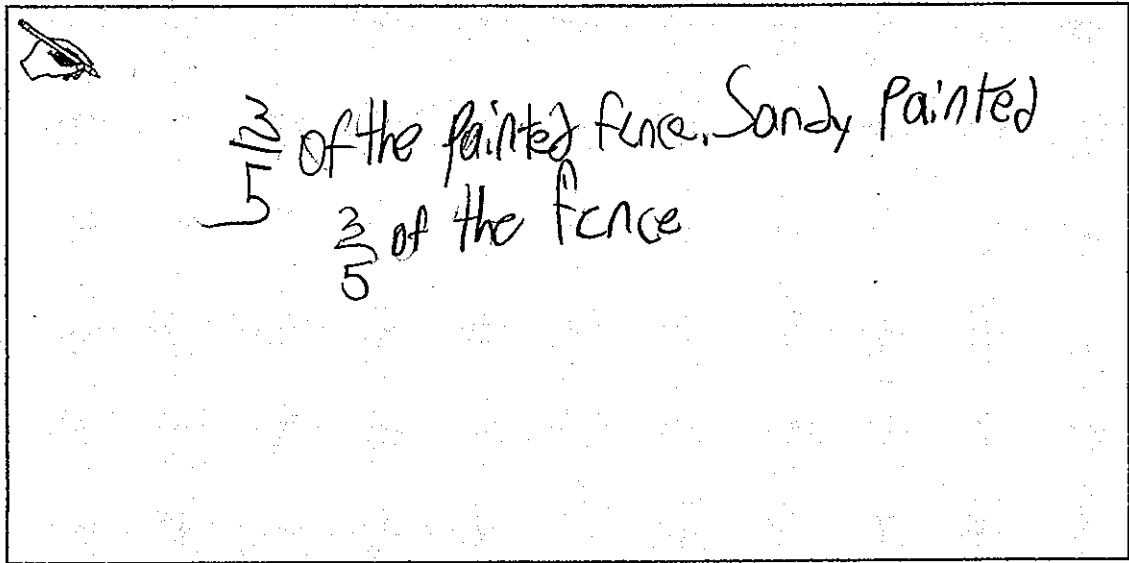
- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.



$\frac{1}{5}$ of the fence is left to be painted by lunch time. So from morning to lunchtime they had painted $\frac{4}{5}$ of the fence.

Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



REVIEW YOUR
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HAVE TIME.

Anchor 10

Litho 00164200171

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

Total Practice Points: 0

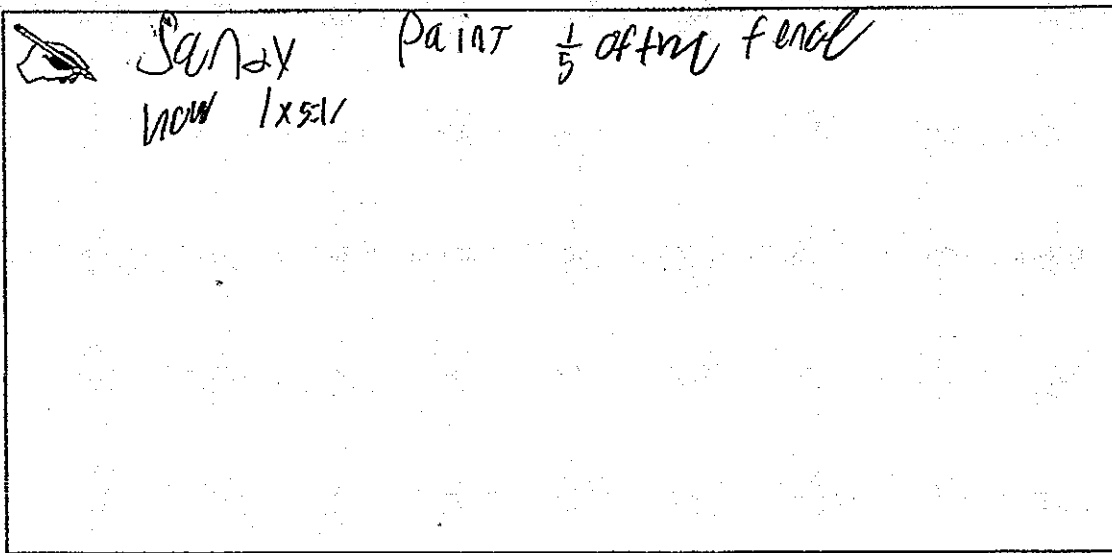
The student identifies the answer in Part A by saying “So from morning to lunchtime they had painted $\frac{4}{5}$ of the fence” (4.NF.B.3d(x)). In Part B, the student finds that Sandy painted $\frac{3}{5}$ of the fence, not $\frac{2}{5}$ (no credit for 4.NF.B.3d(z)). The student does not use a subtraction or addition equation, an expression, or a visual model to represent the situation in Part A (no credit for MP4(x); no credit for MP4(z)).

Total Awarded Points: 1 out of 4

Paint By Numbers Task

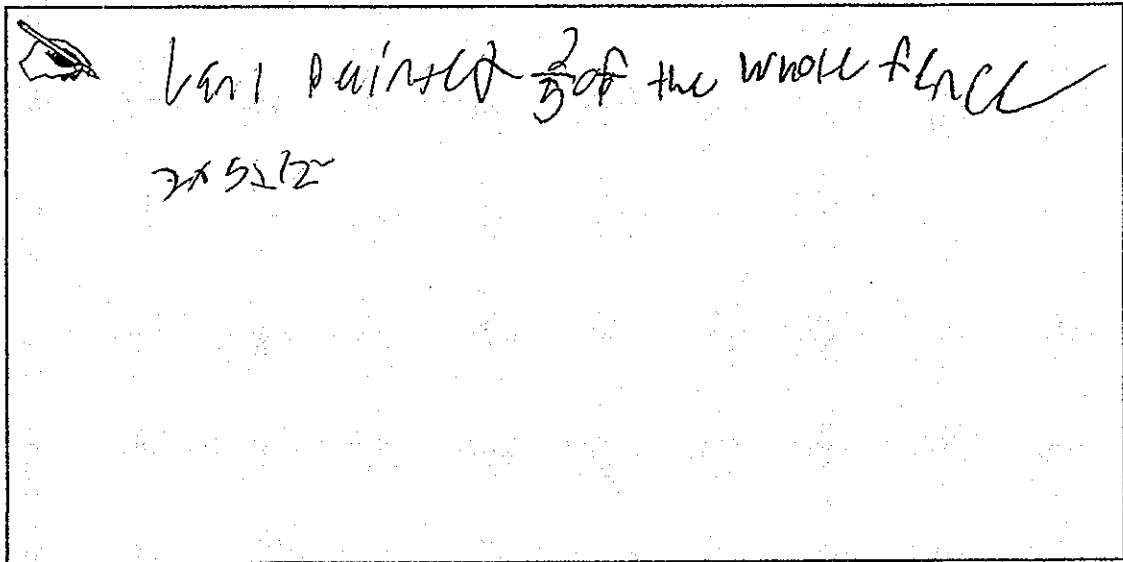
The Johnsons have a fence around their backyard that needs to be painted. Lani and Sandy spent all morning painting the fence. At lunch time, $\frac{1}{5}$ of the fence remains to be painted.

- a. What fraction of the fence did Lani and Sandy paint in the morning? Write an equation and draw a diagram to explain your answer.



Paint By Numbers Task

- b. Lani painted $\frac{2}{5}$ of the whole fence that morning. How much of the fence did Sandy paint?



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Anchor 11

Litho 00434200171

Total Content Points: 0

Total Practice Points: 0

The student incorrectly identifies the answer in Part A by saying, “Sandy paint $\frac{1}{5}$ of the fence” (no credit for 4.NF.B.3d(x)). In Part B, the student mentions that Lani painted $\frac{2}{5}$ of the fence, but does not answer how much of the fence Sandy painted (no credit for 4.NF.B.3d(z)). The student does not use a subtraction or addition equation, an expression, or a visual model to represent the situation in Part A (no credit for MP4(x); no credit for MP4(z)).

Total Awarded Points: 0 out of 4