



Math
Released Item 2016

Grade 5

Leftover Soup
VH104537

Prompt

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

Rubric

Task is worth a total of 3 points.

Leftover Soup	
Score	Description
3	<p>Student response includes the following 3 elements:</p> <p>Reasoning point = 1</p> <ul style="list-style-type: none"> ○ The student explains the error in the reasoning. <p>Reasoning point = 1</p> <ul style="list-style-type: none"> ○ The student explains how to correct the error in the reasoning. <p>Computation point = 1</p> <ul style="list-style-type: none"> ○ The student provides the response of $\frac{3}{16}$ gallon. <p>Sample Student Response:</p> <p>"The student subtracted both the numerator and denominator. You only subtract the numerator after changing to a common denominator."</p> <p>"To fix the error, convert $\frac{3}{8}$ to $\frac{6}{16}$ so both fractions have a common denominator. Then subtract the numerators and leave the denominator the same. The soup left after giving soup to the office is $\frac{3}{16}$."</p> <p>Notes:</p> <ul style="list-style-type: none"> • A variety of explanations are possible. As long as it is clear that the student explains the error in reasoning and how to correct the error in reasoning, credit should be given. • If a computation mistake is made, credit cannot be given for computation but can be given for a valid explanation.
2	Student response includes 2 of the above elements.
1	Student response includes 1 of the above elements.
0	The response is incorrect or irrelevant.

Anchor Set A1 – A8

With Annotations

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

The student is incorrect because you can't subtract numerators and denominators from each other. To correct the error you would have to go back and find a common denominator for 16 and 8. Then you would get 16 since it's the least common denominator. Then you would get $\frac{9}{16}$ and $\frac{6}{16}$. Then you would subtract $\frac{9}{16} - \frac{6}{16}$ and you would get $\frac{3}{16}$. This is because $9 - 6 = 3$ and the denominator 16 would stay the same. So the amount of soup left is $\frac{3}{16}$ gallons.

Annotation

Anchor Paper 1

Score Point 3

This response receives full credit. It includes each of the three required elements:

- The correct computation is provided ($\frac{3}{16}$).
- A correct explanation of the error in reasoning is provided (you can't subtract numerators and denominators from each other). The student explains that the reasoning is incorrect because both the numerators and denominators are subtracted when only numerators should be subtracted.
- A valid explanation on how to correct the error is provided (find a common denominator for 16 and 8). The student correctly converts $\frac{3}{8}$ into an equivalent fraction with common denominator 16 and shows the correct subtraction $\frac{9}{16} - \frac{6}{16}$.

Note: The explanation or the work would receive credit for this element by itself.

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

$\frac{3}{8} = \frac{6}{16}$
 $\frac{9}{16} - \frac{6}{16} = \frac{3}{16}$ My answer is $\frac{3}{16}$. In a subtraction problem, only the numerator is subtracted.

Annotation

Anchor Paper 2

Score Point 3

This response receives full credit. It includes each of the three required elements:

- The correct computation is provided ($\frac{3}{16}$).
Note: The label "gallon" is not required to receive the credit for this element.
- A correct explanation of the error in reasoning is provided (In a subtraction problem, only the numerator is subtracted). The student explains that the reasoning is incorrect because the denominators are also subtracted when only numerators should be subtracted.
- A valid explanation on how to correct the error is provided. The student correctly converts $\frac{3}{8}$ into an equivalent fraction with common denominator 16

($\frac{3}{8} = \frac{6}{16}$) and shows the correct subtraction

$$\left(\frac{9}{16} - \frac{6}{16} = \frac{3}{16}\right).$$

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

he has to make common denominators otherwise it would be wrong. You make common denominators you end up with $\frac{3}{16}$ gallon of soup left over.

Annotation

Anchor Paper 3

Score Point 2

This response receives partial credit. It includes two of the three required elements:

- The correct computation is provided ($\frac{3}{16}$).
- A valid explanation on how to correct the error is provided (you make common denominators).

An explanation of the error in reasoning is inadequate (he has to make common denominators otherwise he would be wrong). To receive the credit for this element the response is required to clarify that the denominators should not be subtracted.

Note: "Find the common denominator" receives credit for fixing the error, but "did not find common denominator" is not a sufficient explanation of the error in student's reasoning.

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

The error was when she subtracted both the numerator and denominator. The student should only subtracted numerator and got $\frac{5}{16}$ gallons. I got my awnser by finding a equal denominator the subtracted my numerator.

Annotation

Anchor Paper 4

Score Point 2

This response receives partial credit. It includes two of the three required elements:

- A correct explanation of the error in reasoning is provided (she subtracted both the numerator and the denominator). The student explains that the reasoning is incorrect because both the numerators and denominators are subtracted when only numerators should be subtracted.
- A valid explanation on how to correct the error is provided (I got my answer by finding a equal denominator the[n] subtracted my numerator).

The computation is incorrect ($\frac{5}{16}$).

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

$$\frac{9}{16} - \frac{3}{8} = \frac{3}{16}$$

Annotation

Anchor Paper 5

Score Point 1

This response receives partial credit. It includes one of the three required elements:

- The correct computation is provided ($\frac{3}{16}$).

An explanation of the error in reasoning is not provided.

An explanation on how to correct the error is not provided. The student does not convert the fractions into equivalent fractions with common denominator 16. Therefore, the subtraction shown is incorrect ($\frac{3}{8} - \frac{6}{16}$).

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

You cant subtract the factions because they have unlike denominators. You have to find a common denominator and see how many times that number goes into the denominator which is 16 and 8 goes into 16 2 times and have to multiply 2 by 3 to get $\frac{6}{16}$ and you do the same for the other number.

Annotation

Anchor Paper 6

Score Point 1

This response receives partial credit. It includes one of the three required elements:

- A valid explanation on how to correct the error is provided (You have to find a common denominator). The student correctly converts $\frac{3}{8}$ into an equivalent fraction with common denominator 16 ($\frac{6}{16}$). The subtraction is not shown. The verbal explanation is required when the subtraction between the equivalent fractions with common denominators is not shown.

The computation is not provided.

An explanation of the error in reasoning is not provided.

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

The student dose not need to subtract.

$$\frac{48}{72}$$

Annotation

Anchor Paper 7

Score Point 0

This response receives no credit. It includes none of the three required elements:

The computation is incorrect ($\frac{48}{72}$). This answer equals $\frac{2}{3}$ when reduced.

An explanation of the error in reasoning is incorrect (The student dose not need to subtract).

An explanation on how to correct the error is not provided.

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

The student messed up when he said $\frac{3}{4}$ he should have said $\frac{1}{2}$ b|c|*thats* as low as it can go. And the office got $\frac{3}{8}$

$$\frac{9}{16} - \frac{3}{8} = \frac{6}{8}$$

Annotation

Anchor Paper 8

Score Point 0

This response receives no credit. It includes none of the three required elements:

The computation is incorrect ($\frac{1}{2}$). The student incorrectly reduces the answer $\frac{6}{8}$ to $\frac{1}{2}$.

An explanation of the error in reasoning is not provided.

An explanation on how to correct the error is not provided. The student does not convert the fractions into equivalent fractions with common denominator 16 and the subtraction shown is incorrect ($\frac{9}{16} - \frac{3}{8} = \frac{6}{8}$).

Practice Set P101 - P105

No Annotations Included

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

The student subtracted the numerator by the numerator and the denominator when he was supposed to find a common denominator with the two numbers then multiply and subtract.

The correct answer is: $\frac{3}{16}$

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

16
8,16

$$\frac{9}{16} - \frac{6}{16} = \frac{3}{16}$$

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

To correct the error the students made, they shouldn't have subtracted the denominators at all. The correct amount of soup left is $\frac{6}{8}$, but simplified $\frac{3}{4}$ gallons, to the school office.

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

He is wrong because you do not subtracted the numerators and denominators. What I first is that I made $\frac{9}{16}$ and $\frac{3}{8}$ have common denominators and then I subtracted only the numerators and got $\frac{6}{16}$.

After a class lunch, the class has $\frac{9}{16}$ gallon of soup left over. They give $\frac{3}{8}$ gallon of this soup to the school office.

A student says they now have $\frac{3}{4}$ gallon of soup left over because when you subtract the numerators and denominators, the difference is $\frac{6}{8}$, and $\frac{6}{8}$ is equivalent to $\frac{3}{4}$ when you divide both the numerator and denominator by 2.

Explain the error in reasoning that the student made.

Explain how to correct the error. Include the correct amount of soup, in gallons, that is left over after giving soup to the school office in your explanation.

Enter your answer and your explanations in the space provided.

The student did not find the common denominator, it was 16, not 8. The real answer is $\frac{5}{16}$ gallon of soup left.

Practice Set

Paper	Score
P101	3
P102	2
P103	1
P104	2
P105	0