2023 MCAS Sample Student Work and Scoring Guide

Grade 7 Mathematics
Question 13: Constructed-Response

Reporting Category: The Number System
Standard: 7.NS.A.3 - Solve real-world and mathematical problems involving the four operations with integers and other rational numbers.
Item Description: Use operations on integers and rational numbers to solve a real-world problem.
Calculator: Allowed

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Scoring Guide
Select a score point in the table below to view the sample student response.

Score*	Description
4A	The student response demonstrates an exemplary understanding of the Number System concepts involved in solving real-world and mathematical problems involving the four operations with integers and other rational numbers. The student correctly converts between cups, tablespoons, and fluid ounces, to determine the number of servings needed for a given recipe.
4B	
3	The student response demonstrates a good understanding of the Number System concepts involved in solving real-world and mathematical problems involving the four operations with integers and other rational numbers. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points.
2	The student response demonstrates a fair understanding of the Number System concepts involved in solving real-world and mathematical problems involving the four operations with integers and other rational numbers. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the Number System concepts involved in solving real-world and mathematical problems involving the four operations with integers and other rational numbers.
0	The student response contains insufficient evidence of an understanding of the Number System concepts involved in solving real-world and mathematical problems involving the four operations with integers and other rational numbers. As a result, the response does not merit any points.

*Letters are used to distinguish between sample student responses that earned the same score (e.g., 4A and 4B).

Score Point 4A

This question has three parts.

Trevor has a recipe for honey mustard salad dressing. This table shows the ingredients and the amounts of each ingredient needed to make his recipe.

Salad Dressing Ingredients

Ingredient	Amount Needed
oil	1 cup
vinegar	$\frac{5}{8}$ cup
honey	$\frac{1}{2}$ cup
mustard	1 tablespoon

1 fluid ounce $=$ 2 tablespoons

1 cup $=$ 8 fluid ounces

Part A

What is the number of fluid ounces of vinegar needed to make Trevor's recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

> Trevor needs 5 fluid ounces if vinegar to make the recipe because if 1 cup is 8 fluid ounces, and there's $\frac{5}{8}$ cups of vinegar, then that's 5 out of 8 fluid ounces.

Part B

What is the total number of fluid ounces of salad dressing that Trevor's recipe will make? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

> The total number of fluid ounces will be 17.5 because theres one cup of oil which is 8, $\frac{5}{8}$ cups of vinegar which is 5, $\frac{1}{2}$ cup of honey which is 4, and 1 tablespoon of mustard which is 0.5. When you add all of that together, you get 17.5.

Part C

Trevor plans to use 3 tablespoons of salad dressing per serving. What is the total number of servings that he can make with his recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

One fluid ounce is 2 tablespoons, and if there's 17.5 fluid ounces, you can multiply 17.5 by 2, which equals 35. If Trevor wants each serving to be 3 tablespoons, then you can do 35 divided by 3, which equals a number in between 11 and 12. So, the total number of serving Trevor can make is 11.

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Score Point 4B
See Score Point 4A for the introduction of this question.

Part A

What is the number of fluid ounces of vinegar needed to make Trevor's recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

5 fluid ounces

$$\frac{5}{8} \times 8 = \frac{40}{8} = 5$$

Part B

What is the total number of fluid ounces of salad dressing that Trevor's recipe will make? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$8 + 5 + 4 + \frac{1}{2} = 17\frac{1}{2} \text{ oz}$$

Part C

Trevor plans to use 3 tablespoons of salad dressing per serving. What is the total number of servings that he can make with his recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

1 cup = 16 tbs

$$16 + 10 + 8 + 1 = 35$$

$$\frac{35}{3} = 11.67$$

11 servings

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Score Point 3
See Score Point 4A for the introduction of this question.

Part A

What is the number of fluid ounces of vinegar needed to make Trevor's recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$\frac{5}{8} \cdot 8 = \frac{40}{8} = 5 \text{ fl oz}$$

Part B

What is the total number of fluid ounces of salad dressing that Trevor's recipe will make? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

if 2 tbsp = 1 fl oz, then 1 tbsp = $\frac{1}{2}$ fl oz

$$(1 \cdot 8) + \left(\frac{5}{8} \cdot 8\right) + \left(\frac{1}{2} \cdot 8\right) + \frac{1}{2}$$

$$8 + 5 + 4 + \frac{1}{2} = 17\frac{1}{2} \text{ fl oz of salad dressing}$$

Part C

Trevor plans to use 3 tablespoons of salad dressing per serving. What is the total number of servings that he can make with his recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

1 fl oz = 2 tbsp

$$17\frac{1}{2} \div 3 = 5.83$$

trevor can make 5 servings with his recipe, leaving less than one serving behind.

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Score Point 2
See Score Point 4A for the introduction of this question.

Part A

What is the number of fluid ounces of vinegar needed to make Trevor's recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

> 5 fluid ounces

Part B

What is the total number of fluid ounces of salad dressing that Trevor's recipe will make? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

> $17 \frac{1}{2}$

Part C

Trevor plans to use 3 tablespoons of salad dressing per serving. What is the total number of servings that he can make with his recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

> 15

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Score Point 1
See Score Point 4A for the introduction of this question.

Part A

What is the number of fluid ounces of vinegar needed to make Trevor's recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

It takes 5 fluid ounces of vinegar to make trevors recipe.

$$\frac{5}{8} \times \frac{8}{1} = \frac{40}{8} = 5$$

I multiplyed these fractions because there is $\frac{5}{8}$ cups of vinegar and 8 fluid ounces so I turned 8 into a fraction by putting it over 1.

Part B

What is the total number of fluid ounces of salad dressing that Trevor's recipe will make? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

1 cup = 8oz . I mulitplied $\frac{5}{8} \times \frac{8}{1} = 5$. Then I multiplied

$$\frac{1}{2} \times \frac{8}{1} = 4 .$$

Part C

Trevor plans to use 3 tablespoons of salad dressing per serving. What is the total number of servings that he can make with his recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$\frac{8}{1} \times \frac{3}{1} = 24$$

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Score Point 0
See Score Point 4A for the introduction of this question.

Part A

What is the number of fluid ounces of vinegar needed to make Trevor's recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$8 + 70\% = 8.7$$

$$8.7 \div 2 = 4.35 \text{ fluid ounces}$$

Part B

What is the total number of fluid ounces of salad dressing that Trevor's recipe will make? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$8 + 0.5 + 4$$

Part C

Trevor plans to use 3 tablespoons of salad dressing per serving. What is the total number of servings that he can make with his recipe? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

1 fluid ounce = 2 table spoons $+ 1 = 1\frac{1}{2}$ amount of servings.

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