2026 MCAS Sample Student Work and Scoring Guide

Grade 10 Mathematics
Question 34: Constructed-Response

Reporting Category: Statistics and Probability
Standard: S-CP.A.1 - Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").

Item Description: Identify specific subsets of a sample space based on real-world data displayed in a Venn diagram.

Calculator: Allowed

This item can be found in the released item sets on the MCAS Resource Center.

Scoring Guide

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

Score*	Description
4A 4B	The student response demonstrates an exemplary understanding of the Statistics and Probability concepts involved in describing events as subsets of a sample space, or as unions, intersections, or complements of events. The student correctly analyzes the sample space within a Venn diagram based on a real-world survey.
3	The student response demonstrates a good understanding of the Statistics and Probability concepts involved in describing events as subsets of a sample space, or as unions, intersections, or complements of events. 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 Statistics and Probability concepts involved in describing events as subsets of a sample space, or as unions, intersections, or complements of events. 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 Statistics and Probability concepts involved in describing events as subsets of a sample space, or as unions, intersections, or complements of events.
0	The student response contains insufficient evidence of an understanding of the Statistics and Probability concepts involved in describing events as subsets of a sample space, or as unions, intersections, or complements of events. As a result, the response does not merit any points.

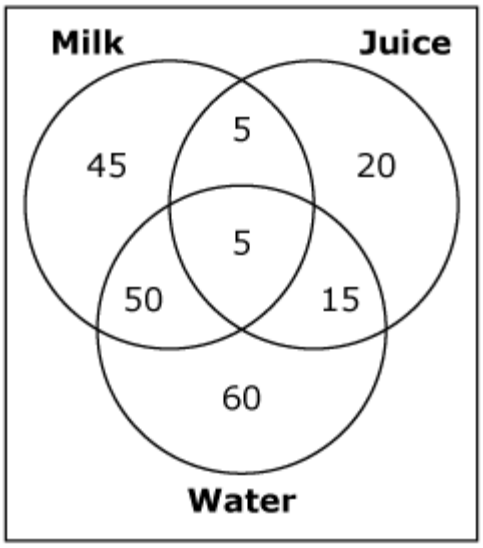
*Letters are used to distinguish between sample student responses that earned the same score (e.g., 4A and 4B).

Question Introduction

This question has four parts.

A principal surveyed 200 tenth-grade students about the types of beverages they prefer with their meals. The options were milk, juice, and water, and students were asked to make one or more selections.

The results of the survey are shown in this Venn diagram.



Score Point 4A

Part A

Based on the Venn diagram, which of the following is the total number of students who selected milk as a preference?

(A) 95
(B) 105
(C) 165
(D) 170

Part B

What is the total number of students who did **not** select milk? Show or explain how you got your answer.

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

There were 200 students, and if 105 selected milk then 200-105 did not select milk. Therefore, 95 did not select milk.

Part C

What is the total number of students who selected **both** water and juice? Show or explain how you got your answer.

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

Both water and juice means looking at when the juice circle and water circle overlap, which lies under the numbers 15 and 5, so 15+5 = 20 students who selected water and juice.

Part D

What is the total number of students who selected juice, but **not** water? Show or explain how you got your answer.

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

A total of 20+5+5+15=45 students selected juice, and in Part C, 20 selected juice and water, so the students who selected juice but not water is 45 - 20 = 25 students.

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Score Point 4B

Part A

Based on the Venn diagram, which of the following is the total number of students who selected milk as a preference?

(A) 95
(B) 105
(C) 165
(D) 170

Part B

What is the total number of students who did **not** select milk? Show or explain how you got your answer.

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

95 students. You just add the student who prefer water and juice

Part C

What is the total number of students who selected **both** water and juice? Show or explain how you got your answer.

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

20 becuase 15 choose only water and juice but the ohter 5 also choose water and juice but they also choose milk.

Part D

What is the total number of students who selected juice, but **not** water? Show or explain how you got your answer.

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

25 student. The student that picked juice and student that picked milk and juice should be added.

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Score Point 3

Part A

Based on the Venn diagram, which of the following is the total number of students who selected milk as a preference?

(A) 95
(B) 105
(C) 165
(D) 170

Part B

What is the total number of students who did **not** select milk? Show or explain how you got your answer.

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

95 because you have to add everything outside of the milk circle so 20+15+60 = 95

Part C

What is the total number of students who selected **both** water and juice? Show or explain how you got your answer.

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

you have to add everything in the juice and water circle so 20+10+15+60+50=155

Part D

What is the total number of students who selected juice, but **not** water? Show or explain how you got your answer.

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

25 because you add everything in the juice circle unless they are in the water circle

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Score Point 2

Part A

Based on the Venn diagram, which of the following is the total number of students who selected milk as a preference?

(A) 95
(B) 105
(C) 165
(D) 170

Part B

What is the total number of students who did **not** select milk? Show or explain how you got your answer.

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

95, i just counted all the ones not in the circle of milk

Part C

What is the total number of students who selected **both** water and juice? Show or explain how you got your answer.

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

25, only the ones in the circles combined of the two drinks

Part D

What is the total number of students who selected juice, but **not** water? Show or explain how you got your answer.

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

20 its the only one thats in the only juice

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Score Point 1

Part A

Based on the Venn diagram, which of the following is the total number of students who selected milk as a preference?

(A) 95 (B) 105

(C) 165 (D) 170

Part B

What is the total number of students who did **not** select milk? Show or explain how you got your answer.

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

The total amount of students who did not select milk is 95 I got the answer by looking at what the other students perferred instead of milk and added them up to get 95

Part C

What is the total number of students who selected **both** water and juice? Show or explain how you got your answer.

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

The total number of students who selected water and juice is 10 in the venn diagram they both share 5 students who like both milk and juice.

Part D

What is the total number of students who selected juice, but **not** water? Show or explain how you got your answer.

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

the total number of students who selected juice is 20 in the venn diagram the juice circle overlaps the water circle so only 20 is left out

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Score Point 0

Part A

Based on the Venn diagram, which of the following is the total number of students who selected milk as a preference?

(A) 95 (B) 105

(C) 165 (D) 170

Part B

What is the total number of students who did **not** select milk? Show or explain how you got your answer.

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

The total numbers of kids is 100 that did not selected milk. How i got my answer is i added the numbers of kids who did not select milk.

Part C

What is the total number of students who selected **both** water and juice? Show or explain how you got your answer.

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

100

Part D

What is the total number of students who selected juice, but **not** water? Show or explain how you got your answer.

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

45 is the answer. I got my answer by adding the amount of kids who picked juice

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