

# 2024 MCAS Informational Webinar on Constructed Responses

## Sample Constructed-Response Scoring Training Pack

### Grade 10 Mathematics

Question 1: MCAS Grade 10 Mathematics  
(Released in 2021)

The types and colors of the vehicles for sale at a dealership are shown in this table.

**Vehicles for Sale**

	<b>Red</b>	<b>Blue</b>	<b>Green</b>	<b>Total</b>
<b>Vans</b>	53	127	51	231
<b>Trucks</b>	62	78	49	189
<b>Total</b>	115	205	100	420

- A. Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.
- B. What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.
- C. What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.
- D. How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

# Grade 10 Constructed Response Sample Response

**Part A:** 45%

- There are 420 total vehicles at the dealership, 189 of which are trucks.
- $\frac{189}{420} = 0.45$

**Part B:**  $\frac{127}{231}$

- There are 231 vans for sale and 127 of them are blue OR
- Equivalent percentage with work or explanation

**Part C:**  $\frac{293}{420}$

- There are 115 red vehicles and there are 231 vans, 53 of which are red.
- $(115 + 231 - 53) / 420 = \frac{293}{420}$

**Part D:** 104

- There are 53 red vans and there are 51 green vans for sale.
- $53 + 51 = 104$

## Grade 10 Constructed Response Scoring Guide

<b>Scoring Guide</b>	
<b>Score</b>	<b>Description</b>
<b>4</b>	The student response demonstrates an exemplary understanding of the Statistics and Probability concepts involved in summarizing categorical data for two categories in two-way frequency tables and interpreting relative frequencies in the context of the data. The student calculates relative frequencies based on information in a table.
<b>3</b>	The student response demonstrates a good understanding of the Statistics and Probability concepts involved in summarizing categorical data for two categories in two-way frequency tables and interpreting relative frequencies in the context of the data. 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.
<b>2</b>	The student response demonstrates a fair understanding of the Statistics and Probability concepts involved in summarizing categorical data for two categories in two-way frequency tables and interpreting relative frequencies in the context of the data. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
<b>1</b>	The student response demonstrates a minimal understanding of the Statistics and Probability concepts involved in summarizing categorical data for two categories in two-way frequency tables and interpreting relative frequencies in the context of the data.
<b>0</b>	The student response contains insufficient evidence of an understanding of the Statistics and Probability concepts involved in summarizing categorical data for two categories in two-way frequency tables and interpreting relative frequencies in the context of the data. As a result, the response does not merit any points.

# Constructed Response Scoring Notes

## Answer-only (possible in all parts):

### **Part B:**

- full credit for correct fraction  $\frac{127}{231}$  with no work or support

### **Parts A, C and D:**

- One or two answer(s)-only = 1 point
- Three answers-only = 2 points

## Scoring for each part:

### **Part A:**

- Correct fraction with incorrect percentage is scored as answer-only

### **Part B:**

- full credit for correct *fraction* with no work/explanation since information can only be found by reading table correctly
- full credit for a correct *percentage* with correct fraction in work or explanation

### **Part C:**

- percentage of 69-70% with no work or explanation shows some understanding at the 0/1 score line

### **Part D:**

- full credit for an answer of  $\frac{104}{420}$  with work or explanation
- answer of  $\frac{104}{420}$  with no work or explanation shows some understanding at the 0/1 score line

Training Set of Student Responses  
(*with scores*)

Anchor Score: 4

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

$$45\%$$
$$\frac{189}{420} = .45$$

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

$$\frac{127}{231}$$

number of blue vans over number of total vans

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

$$231 (\text{vans}) + 62 (\text{Red Trucks}) = 293$$
$$\frac{293}{420}$$

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

$$53 + 51 = 104$$

## Anchor Score: 3

### Part A

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

45% of the vehicles are trucks at the dealership. I found this by taking the total number of trucks, 189, and dividing it by the total number of vehicles on sale, 420.

$$\frac{189}{420} = .45 = 45\%$$

### Part B

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

$$\frac{127}{231}$$

I took the amount of vans that were blue and put in a fraction as the numerator. The denominator is the total number of vans for sale.

### Part C

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

$$\frac{346}{420}$$

I got 346 by adding the total number of vans on sale and adding the total number of red vehicles. The denominator is 420 because that was the total number of vehicles on sale.

### Part D

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

$$\frac{104}{420}$$

I found 104 by adding together the number of green vans and the number of red vans. The denominator is the total number of vehicles on sale, 420.

Anchor Score: 2

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

about 45 percetnt becasue 180 divided by 420 equals .45

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

127 over 231

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

231 over 420

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

215

Anchor Score: 1

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

47%

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

49%

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

94%

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

104

Anchor Score: 0

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

the percentage of trucks is below 50%  
eacaus the total of trucks is 189 and  
vans ar 231

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

$\frac{3}{4}$  i lookd at the data and went thats  
the aswer

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

$\frac{1}{5}$  beacause it is very little

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

$\frac{3}{4}$  of it is the answer because th data

Set of Student Responses  
*(without scores)*  
For Educator Practice

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

you add all the number trucks there is  
and you get a total of 189

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

$\frac{127}{321}$  you add all the number of vans  
and get total of 321 and the blue vans  
that are blue are 127.

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

208

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

104 you add the number of green and  
red

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

$$\frac{189}{420} = .45 = 45\%$$

45% of vehicles are trucks

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

$$\frac{127}{231}$$

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

$$62 + 231 = 293$$

$$\frac{293}{420}$$

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

$$53 + 51 = 104$$

104 of the vehicles for sale are vans  
and are either red or green

$\frac{104}{420}$  of the vehicles for sale are vans  
and are either red or green

24% of the vehicles for sale are vans  
and are either red or green

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

28%

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

$\frac{205}{420}$

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

about 70%

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

3

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

30% are trucks

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

$\frac{127}{600}$

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

$\frac{50}{600}$

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

430  
 $53 + 62 + 115 + 51 + 49 + 100 = 430$

**Part A**

Based on the table, what percentage of the vehicles for sale at the dealership are trucks? Show or explain how you got your answer.

45% of the cars at the dealerships are trucks. To solve for this you must add the total number of trucks, then you must add the total number of cars. Finally, divide the number of trucks by the number of total cars and multiply by 100 to find the answer.

**Part B**

What **fraction** of the vans for sale at the dealership are blue? Show or explain how you got your answer.

About 55% of the vans are blue. To solve this you must, divide the total number of blue vans by the total number of vans and multiply by 100. Finally, round to get the answer.

**Part C**

What fraction of the vehicles for sale at the dealership are red **or** are vans? Show or explain how you got your answer.

$\frac{293}{420}$  are the total of red or vans in the dealership. To find this you must add the total of red cars and the the total of vans together but only add the red van once. Then you divide by the total number of cars.

**Part D**

How many of the vehicles for sale at the dealership are vans **and** are either red **or** green? Show or explain how you got your answer.

342 are either vans and red or green. To find this you must add the total number of vans and the the total number of red and green cars. But you don't add the red and green van more than once to the number.

## Question 2: MCAS Grade 10 Mathematics

*(Released in 2023)*

Ellis runs around a track at a constant speed.

- The distance around the track is  $\frac{1}{4}$  mile.
  - It takes Ellis 3.2 minutes to run around the track once.
- A. What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.
- B. What is the total distance, in **feet**, Ellis runs in 1 minute? Show or explain how you got your answer.
- C. What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.
- D. Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

# Constructed Response Sample Response

**Part A:** 12 minutes 48 seconds

- $3.2 \times 4 = 12.8$  minutes (multiply 0.8 by 60 to get seconds) OR
- Other mathematically equivalent answer

**Part B:** 412.5 feet/min

- $\frac{1320}{3.2} = 412.5$  OR  $\frac{5280}{12.8} = 412.5$  OR
- Other mathematically equivalent answer

**Part C:** 4.6875 miles per hour

- $\frac{1 \text{ mile}}{12.8 \text{ minutes}} \cdot \frac{60 \text{ minutes}}{1 \text{ hour}} = 4.6875 \frac{\text{miles}}{\text{hour}}$  OR
- Other mathematically equivalent answer

**Part D:** Yes, Ellis will reach his goal.

- If he runs for 40 minutes, he will cover 12.5 laps each day, which is 62.5 laps in 5 days
- $\frac{62.5}{4} = 15.625$ , so he will cover 15.625 miles in the week, which is greater than 15 miles OR equivalent

## Constructed Response Scoring Guide

<b>Scoring Guide</b>	
<b>Score</b>	<b>Description</b>
<b>4</b>	The student response demonstrates an exemplary understanding of the Number and Quantity concepts involved in using units as a way to understand problems and to guide the solution of multi-step problems. The student uses dimensional analysis and solves problems that require the manipulation of units.
<b>3</b>	The student response demonstrates a good understanding of the Number and Quantity concepts involved in using units as a way to understand problems and to guide the solution of multi-step problems. 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.
<b>2</b>	The student response demonstrates a fair understanding of the Number and Quantity concepts involved in using units as a way to understand problems and to guide the solution of multi-step problems. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
<b>1</b>	The student response demonstrates a minimal understanding of the Number and Quantity concepts involved in using units as a way to understand problems and to guide the solution of multi-step problems.
<b>0</b>	The student response contains insufficient evidence of an understanding of the Number and Quantity concepts involved in using units as a way to understand problems and to guide the solution of multi-step problems. As a result, the response does not merit any points.

# Constructed Response Scoring Notes

## Answer-only (possible in Parts A, B and C):

- One or two answer(s)-only = 1 point
- Three answers-only = 2 points

## Handy conversions:

- 1 mile = 5280 feet
- 1 mile = 1760 yards
- $\frac{1}{4}$  mile = 1320 feet
- $\frac{1}{4}$  mile = 440 yards

## Scoring for each part:

### **Part A:**

- Full credit for rounding to 13 or truncating to 12 with appropriate work/explanation.
- No credit for rounding/truncating to 13 or 12 with no work/explanation. It is **not** accepted as answer-only.

### **Part B:**

- Full credit for truncating 412.5 to 412 with appropriate work/explanation.
- No credit for calculating 1320 feet per  $\frac{1}{4}$  mile.

### **Part C:**

- A response of 4.6 or 4.7 (*or more precise*) is acceptable without support and is scored as answer-only.
- Full credit for rounding to 5 or truncating to 4 with appropriate work/explanation.
- No credit for a response of 4 or 5 only.

### **Part D:**

- This question is dichotomous, so no credit for a response of “yes” only.
- Full credit for a response of “yes” with supporting work or explanation to show more than 15 miles running.
- Full credit for a response of “yes” with supporting work or explanation to show fewer than 200 minutes running.

Training Set of Student Responses  
(*with scores*)

## Training Response Score: 4

### Part A

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

12.8 minutes

$$3.2 \times 4 = 12.8$$

### Part B

What is the total distance, in feet, Ellis runs in 1 minute? Show or explain how you got your answer.

412 feet

$\frac{1}{4}$  mile is 1320 feet

$$1320 \div 3.2 = 412$$

### Part C

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

4.6 Miles per hour

60 miles per hour as reference for 1 hour.

$$60 \div 12.8 = 4.6$$

### Part D

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

Yes he will.

$$40 \times 5 = 200$$

$$200 \div 12.8 = 15.625$$

## Training Response Score: 3

### Part A

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

It take Ellis 12.8 minutes to around a mile.

### Part B

What is the total distance, in **feet**, Ellis runs in 1 minute? Show or explain how you got your answer.

Ellis runs 412.5 feet per minute.

### Part C

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

Ellis runs 4.7 miles per hour.

### Part D

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

Yes Ellis will meet this goal because they will run 15.62 miles if they run 40 minutes for 5 days.

## Training Response Score: 2

### Part A

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

12.8 minutes.  $\frac{1}{4}$  of a mile is 1320 feet. multiply 3.4 by 4 and you get 12.8

### Part B

What is the total distance, in feet, Ellis runs in 1 minute? Show or explain how you got your answer.

412.5.  $\frac{1}{4}$  of a mile is 1320 feet. Divide that by 3.2. You get 412.5 feet a minute.

### Part C

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

2.4 miles pe hour

### Part D

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

Yes, she will even succeed her goal too. 12.8 multiplied by 5 is 64.

## Training Response Score: 1

### Part A

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

12.8 minutes

### Part B

What is the total distance, in feet, Ellis runs in 1 minute? Show or explain how you got your answer.

2450 feet

### Part C

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

19 mph

### Part D

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

yes

**Part A**

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

3.2 minutes

**Part B**

What is the total distance, in feet, Ellis runs in 1 minute? Show or explain how you got your answer.

400 feet

**Part C**

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

5 miles

**Part D**

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

$5 + 15 + 40 = 60$

Set of Student Responses  
(*without scores*)  
For Educator Practice

**Part A**

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

$$3.2 \times 4$$

takes 12.8 minutes

**Part B**

What is the total distance, in **feet**, Ellis runs in 1 minute? Show or explain how you got your answer.

$$\frac{5280}{4}$$

1320 ft

**Part C**

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

4 mph

$$\frac{60}{12.8}$$

**Part D**

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

yes

**Part A**

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

$$3.2 \times 4$$

12.8 minutes takes ellis 3.2 minutes to run  $\frac{1}{4}$  of a mile I multiplied that by 4 to get the full mile

**Part B**

What is the total distance, in **feet**, Ellis runs in 1 minute? Show or explain how you got your answer.

412.5 feet per minute

1 mile is 5280 feet

$$5,280 \div 4$$

$$1320 \div 3.2 \text{ minutes} = 412.5 \text{ per minute}$$

**Part C**

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

4.6 miles per hours

$$60 \div 12.8 \text{ minutes} = 4.6$$

**Part D**

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

$$12.8 \times 15$$

it will take 192 minutes to complete this goal

because every mile ellis take 12.8 minutes

and his goal in total will take 200 minutes

$$40 \times 5 = 200$$

he will make his goal

**Part A**

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

it takes Willis around 13 minutes to run a mile. I took how many minutes it takes her to run a lap timed by how many laps in total there is.

**Part B**

What is the total distance, in feet, Ellis runs in 1 minute? Show or explain how you got your answer.

400 ft she can run in a minute.

**Part C**

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

$\frac{3.2}{\frac{1}{4}}$  3.2 over  $\frac{1}{4}$  because 3.2 is how much shes runs a lap in to the  $\frac{1}{4}$  of laps

**Part D**

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

Yes because of her pace she will be able to, as long as she stays the steady pace shes at

**Part A**

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

it took her 3.2 minutes to make a full lap around the track

**Part B**

What is the total distance, in **feet**, Ellis runs in 1 minute? Show or explain how you got your answer.

she would be running only a quarter of it if she ran for one minute considering it only took her 3.2 minutes to get around it fully

**Part C**

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

7mhp she was only running a short distance and she was running an avg mph of 7

**Part D**

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

Yes she will as she trains more her speed is only going to get better thus leading her to get faster and get her time to her liking

**Part A**

What is the total amount of time, in minutes, it takes Ellis to run one mile? Show or explain how you got your answer.

$$\frac{1}{4} = 3.2$$

$$3.2 \times 4 = 12.8$$

**Part B**

What is the total distance, in feet, Ellis runs in 1 minute? Show or explain how you got your answer.

125 feet.

**Part C**

What is the rate, in miles per hour, Ellis runs around the track? Show or explain how you got your answer.

12.8 minutes = 1 mile

60 minutes / 12.8 miles = 4.6875

Ellis can run about 5 miles in a hour.

**Part D**

Ellis will run for 40 minutes every day for 5 days, with a goal of running a total of 15 miles. Will Ellis meet this goal? Explain your reasoning.

yes Ellis will because in 38.4 minutes Ellis runs 3 miles so in 5 days she will meet her goal in 15 miles total.