2021 MCAS Sample Student Work and Scoring Guide

Grade 6 Mathematics Question 14: Constructed-Response

Reporting Category: Ratios and Proportional Relationships

Standard: <u>6.RP.A.1</u> - Understand the concept of a ratio including the distinctions between part:part and part:whole and the value of a ratio; part/part and part/whole. Use ratio language to describe a ratio relationship between two quantities.

Item Description: Solve a real-world problem by interpreting and finding ratios based on a given ratio relationship.

Calculator: Not allowed

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Scoring Guide

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

Score*	Description
<u>4A</u>	The student response demonstrates an exemplary understanding of the Ratios and Proportional Relationships concepts involved in making distinctions between part:part and part:whole and the value of a ratio; and using ratio language to describe a ratio relationship.
<u>4B</u>	
<u>3</u>	The student response demonstrates a good understanding of the Ratios and Proportional Relationships concepts involved in making distinctions between part:part and part:whole and the value of a ratio; and using ratio language to describe a ratio relationship. 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 Ratios and Proportional Relationships concepts involved in making distinctions between part:part and part:whole and the value of a ratio; and using ratio language to describe a ratio relationship. 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 Ratios and Proportional Relationships concepts involved in making distinctions between part:part and part:whole and the value of a ratio; and using ratio language to describe a ratio relationship.
<u>0</u>	The student response contains insufficient evidence of an understanding of the Ratios and Proportional Relationships concepts involved in making distinctions between part:part and part:whole and the value of a ratio; and using ratio language to describe a ratio relationship. 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 four parts.

On Monday, there were $18\ {\rm chickens}\ {\rm and}\ 12\ {\rm sheep}\ {\rm in}\ {\rm a}\ {\rm field}.$ There were no other animals in the field.

Part A

What was the ratio of chickens to sheep in the field on Monday?

Enter your ratio in the space provided.

3:2

Part B

For every 2 sheep in the field on Monday, how many chickens were in the field? Show or explain how you got your answer.

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

There are 3 chickens for every 2
sheep. $18 \div 6 = 3$ and $12 \div 6 = 2$

Part C

The ratio 3:5 can also be used to describe a relationship between the animals in the field on Monday. What relationship could this ratio describe? Show or explain how you got your answer.

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

This could be the ratio of chickens to the total amount of animals. 18 + 12 = 30 $30 \div 6 = 5$ $18 \div 6 = 3$

Part D

On Tuesday, there were $4\ more$ sheep in the field. Write a ratio to show the relationship between the number of sheep and the total number of animals in the field on Tuesday. Show or explain how you got your answer.

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

8:17
30 + 4 = 34
12 + 4 = 16
$34 \div 2 = 17$
$16 \div 2 = 8$

Score Point 4B

This question has four parts.

On Monday, there were $18\ \text{chickens}\ \text{and}\ 12\ \text{sheep}\ \text{in}\ \text{a}\ \text{field}.$ There were no other animals in the field.

Part A

What was the ratio of chickens to sheep in the field on Monday?

Enter your ratio in the space provided.

18:12

Part B

For every 2 sheep in the field on Monday, how many chickens were in the field? Show or explain how you got your answer.

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

For every 2 sheep in the field on Monday there were three chickens because $2 \cdot 6 = 12$ and there is 12 sheep, and $3 \cdot 6 = 18$ and there is 18 chickens.

Part C

The ratio 3:5 can also be used to describe a relationship between the animals in the field on Monday. What relationship could this ratio describe? Show or explain how you got your answer.

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

It could describe the ratio of chickens compared to all the animals in the field ;because if there is 18 chickens and 30 animals than $18 \div 6 = 3$ and $30 \div 6 = 5$. This means that the ratio 3:5 is representing the number of chickens compared to all of the animals.

Part D

On Tuesday, there were $4\,$ more sheep in the field. Write a ratio to show the relationship between the number of sheep and the total number of animals in the field on Tuesday. Show or explain how you got your answer.

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

8:17 is the ratio to sheep to all the animals. I got my answer by finding that on Tuesday there were 16 sheep and 34 total animals; if you divide 16 and 34 by 2 you get the ratio 8:17.

This question has four parts.

On Monday, there were $18\ {\rm chickens}\ {\rm and}\ 12\ {\rm sheep}\ {\rm in}\ {\rm a}\ {\rm field}.$ There were no other animals in the field.

Part A

What was the ratio of chickens to sheep in the field on Monday?

Enter your ratio in the space provided.

18:12

Part B

For every 2 sheep in the field on Monday, how many chickens were in the field? Show or explain how you got your answer.

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

 $\begin{array}{l} 12 \div 2 = 6 \\ 18 \div 3 = 6 \\ \text{3 chickens} \end{array}$

Part C

The ratio 3:5 can also be used to describe a relationship between the animals in the field on Monday. What relationship could this ratio describe? Show or explain how you got your answer.

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

The total amunt of animals is 30 $30 \div 5 = 6$ $18 \div 3 = 6$ The ratio comes from the chickens comared to all other animals.

Part D

On Tuesday, there were $4\ more$ sheep in the field. Write a ratio to show the relationship between the number of sheep and the total number of animals in the field on Tuesday. Show or explain how you got your answer.

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

16 sheep 30 total animals 6:30

This question has four parts.

On Monday, there were $18\ \text{chickens}\ \text{and}\ 12\ \text{sheep}\ \text{in}\ \text{a}\ \text{field}.$ There were no other animals in the field.

Part A

What was the ratio of chickens to sheep in the field on Monday?

Enter your ratio in the space provided.

18:12

Part B

For every 2 sheep in the field on Monday, how many chickens were in the field? Show or explain how you got your answer.

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

6 chickens were in the field. I got that by subtracting 18 - 12.

Part C

The ratio 3:5 can also be used to describe a relationship between the animals in the field on Monday. What relationship could this ratio describe? Show or explain how you got your answer.

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

The relationship this ratio could describe is 18:12 symplyfied. I got that by simplifying 18:12

Part D

On Tuesday, there were 4 more sheep in the field. Write a ratio to show the relationship between the number of sheep and the total number of animals in the field on Tuesday. Show or explain how you got your answer.

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

16:34 I got that by adding 4 + 12 to get the number of sheep and 16 + 18 to get the total number of animals.

This question has four parts.

On Monday, there were $18\ \text{chickens}$ and $12\ \text{sheep}$ in a field. There were no other animals in the field.

Part A

What was the ratio of chickens to sheep in the field on Monday?

Enter your ratio in the space provided.

18:12

Part B

For every 2 sheep in the field on Monday, how many chickens were in the field? Show or explain how you got your answer.

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

9 chickens were % 2 in the feild because $18\div 2=9$

Part C

The ratio 3:5 can also be used to describe a relationship between the animals in the field on Monday. What relationship could this ratio describe? Show or explain how you got your answer.

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

For every 3 sheep there were 5 chickens.

Part D

On Tuesday, there were 4 more sheep in the field. Write a ratio to show the relationship between the number of sheep and the total number of animals in the field on Tuesday. Show or explain how you got your answer.

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

18:26

This question has four parts.

On Monday, there were $18\ \text{chickens}\ \text{and}\ 12\ \text{sheep}\ \text{in}\ \text{a}\ \text{field}.$ There were no other animals in the field.

Part A

What was the ratio of chickens to sheep in the field on Monday?

Enter your ratio in the space provided.

6:3 ratio

Part B

For every 2 sheep in the field on Monday, how many chickens were in the field? Show or explain how you got your answer.

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

9 because $18 \div 2 = 9$

Part C

The ratio 3:5 can also be used to describe a relationship between the animals in the field on Monday. What relationship could this ratio describe? Show or explain how you got your answer.

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

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3 because 12 \div 4 = 3 and 5 because 5 because 5 \times 3 = 15
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Part D

On Tuesday, there were $4\ more$ sheep in the field. Write a ratio to show the relationship between the number of sheep and the total number of animals in the field on Tuesday. Show or explain how you got your answer.

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

