2021 MCAS Sample Student Work and Scoring Guide

Grade 7 Mathematics
Question 2: Constructed-Response

Reporting Category: The Number System
Standard: 7.NS.A.2 - Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide integers and other rational numbers.
Item Description: Use operations with positive and negative rational numbers to solve mathematical problems.
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
4A	The student response demonstrates an exemplary understanding of the Number System concepts involved in applying and extending previous understandings of multiplication and division and of fractions to multiply and divide integers and other rational numbers. The student explains if the quotient of an integer and a fraction is a rational number.
4B	
3	The student response demonstrates a good understanding of the Number System concepts involved in applying and extending previous understandings of multiplication and division and of fractions to multiply and divide 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 applying and extending previous understandings of multiplication and division and of fractions to multiply and divide 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 applying and extending previous understandings of multiplication and division and of fractions to multiply and divide integers and other rational numbers.
0	The student response contains insufficient evidence of an understanding of the Number System concepts involved in applying and extending previous understandings of multiplication and division and of fractions to multiply and divide 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 four parts.

A student is practicing multiplication and division.

Part A

The student writes these numbers on a sheet of paper.

$$-35, \frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $-35 \cdot \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

-25

Part B

The student writes these numbers on another sheet of paper.

$$-35, -\frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $(-35) \cdot \left(-\frac{5}{7}\right)$?

Enter your answer in the space provided.

25

Part C

The student then divides the two numbers used in Part A.

What is the value of $(-35) \div \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

-49

Part D

Determine whether your answer in Part C is rational. Explain your reasoning.

Enter your answer and your explanation in the space provided.

My answer from Part C is rational. I know my answer is rational because the definition of a rational number states that rational numbers include whole numbers, natural numbers, integers, fractions, etc. My answer (which was -49) was a whole number, which is included as a rational number.

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Score Point 4B

This question has four parts.

A student is practicing multiplication and division.

Part A

The student writes these numbers on a sheet of paper.

$-35, \frac{5}{7}$

The student multiplies the two numbers.

What is the value of $-35 \cdot \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$-35 \cdot \left(\frac{5}{7}\right) = -25$

Part B

The student writes these numbers on another sheet of paper.

$-35, -\frac{5}{7}$

The student multiplies the two numbers.

What is the value of $(-35) \cdot \left(-\frac{5}{7}\right)$?

Enter your answer in the space provided.

$(-35) \cdot \left(-\frac{5}{7}\right) = 25$

Part C

The student then divides the two numbers used in Part A.

What is the value of $(-35) \div \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$(-35) \div \left(\frac{5}{7}\right) = -49$

Part D

Determine whether your answer in Part C is rational. Explain your reasoning.

Enter your answer and your explanation in the space provided.

Yes, my anwser to part C is rational because a rational number is any number that can be written as a fraction. $-49 = -\frac{49}{1}$

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Score Point 3

This question has four parts.

A student is practicing multiplication and division.

Part A

The student writes these numbers on a sheet of paper.

$$-35, \frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $-35 \cdot \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$-25.$

Part B

The student writes these numbers on another sheet of paper.

$$-35, -\frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $(-35) \cdot \left(-\frac{5}{7}\right)$?

Enter your answer in the space provided.

25.

Part C

The student then divides the two numbers used in Part A.

What is the value of $(-35) \div \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$-49.$

Part D

Determine whether your answer in Part C is rational. Explain your reasoning.

Enter your answer and your explanation in the space provided.

It is irrational because it is a negative number.

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Score Point 2

This question has four parts.

A student is practicing multiplication and division.

Part A

The student writes these numbers on a sheet of paper.

$$-35,\ \frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $-35 \cdot \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$-\frac{175}{7}$ is what you get when you multiply these two numbers.

Part B

The student writes these numbers on another sheet of paper.

$$-35,\ -\frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $(-35) \cdot \left(-\frac{5}{7}\right)$?

Enter your answer in the space provided.

it would be the same thing but this time it would be positive so it would be $\frac{175}{7}$

Part C

The student then divides the two numbers used in Part A.

What is the value of $(-35) \div \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

it would be $-\frac{7}{7} = -1$

Part D

Determine whether your answer in Part C is rational. Explain your reasoning.

Enter your answer and your explanation in the space provided.

it is -1 because if you divid those 2 numbers then you would get 7 for the top and 7 for the bottom but seeing as the 35 is negative the end result will be to.

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Score Point 1

This question has four parts.

A student is practicing multiplication and division.

Part A

The student writes these numbers on a sheet of paper.

$-35, \frac{5}{7}$

The student multiplies the two numbers.

What is the value of $-35 \cdot \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$-35 \times \frac{5}{7} = \frac{-175}{7} = -25$

negative 35 times 5 is negative 175. divide negative 175 by 7 and you get negative 25.

Part B

The student writes these numbers on another sheet of paper.

$-35, -\frac{5}{7}$

The student multiplies the two numbers.

What is the value of $(-35) \cdot \left(-\frac{5}{7}\right)$?

Enter your answer in the space provided.

$^{-}35 \times {}^{-}\left(\frac{5}{7}\right) = \frac{175}{7} = {}^{-}25$

the two negatives satyed the same but turned the answer still into a negative number.

Part C

The student then divides the two numbers used in Part A.

What is the value of $(-35) \div \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$^{-}35 \div \frac{5}{7} = \frac{^{-}7}{7} = 0$

I divided $^{-}35$ by 5 and got $^{-}7$. negative seven over seven equals 0.

Part D

Determine whether your answer in Part C is rational. Explain your reasoning.

Enter your answer and your explanation in the space provided.

I got this because they're the same number with the same value and neither one will get positive or negative so it set between, landing at zero.

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Score Point 0

This question has four parts.

A student is practicing multiplication and division.

Part A

The student writes these numbers on a sheet of paper.

$$-35, \frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $-35 \cdot \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$$\frac{-35}{1} \times \frac{5}{7} = x$$
$$35 \times 5 = 175$$
$$-35 \times 5 = -175$$
$$1 \times 7 = 7$$
$$x = -35$$

Part B

The student writes these numbers on another sheet of paper.

$$-35, -\frac{5}{7}$$

The student multiplies the two numbers.

What is the value of $(-35) \cdot \left(-\frac{5}{7}\right)$?

Enter your answer in the space provided.

$$\frac{-35}{1} \times \left(-\frac{5}{7}\right) = y$$
$$-35 \times (-5) = 175$$
$$1 \times (-7) = -7$$
$$y = \frac{175}{-7}$$

Part C

The student then divides the two numbers used in Part A.

What is the value of $(-35) \div \left(\frac{5}{7}\right)$?

Enter your answer in the space provided.

$$\frac{-35}{1} \div \frac{5}{7} = a$$
$$\frac{-35}{1} \times \frac{7}{5} = \frac{-175}{5}$$
$$a = -55$$

Part D

Determine whether your answer in Part C is rational. Explain your reasoning.

Enter your answer and your explanation in the space provided.

Yes, because a rational number is any whole number with no fractions or decimals attached.

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