

2021 MCAS Sample Student Work and Scoring Guide

Grade 10 Mathematics

Question 34: Constructed-Response

Reporting Category: Algebra and Functions

Standards: [AI.A-CED.A.1](#) - Create equations and inequalities in one variable and use them to solve problems. (Include equations arising from linear, quadratic, and exponential functions with integer exponents.)

[MI.A-CED.A.1](#) - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and exponential functions with integer exponents.

[MII.A-CED.A.1](#) - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from quadratic and exponential functions.

Item Description: Write and solve a linear equation and linear inequalities based on a real-world situation.

Calculator: Allowed

[View item in MCAS Digital Item Library](#)

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 Algebra concepts involved in creating equations and inequalities in one variable and using them to solve problems. The student writes and solves inequalities to model a situation and applies the solutions to the context of the problem.
4B	
3	The student response demonstrates a good understanding of the Algebra concepts involved in creating equations and inequalities in one variable and using them to solve 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.
2	The student response demonstrates a fair understanding of the Algebra concepts involved in creating equations and inequalities in one variable and using them to solve problems. 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 Algebra concepts involved in creating equations and inequalities in one variable and using them to solve problems.
0	The student response contains insufficient evidence of an understanding of the Algebra concepts involved in creating equations and inequalities in one variable and using them to solve problems. 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.

Mikaila is saving money to purchase a laptop computer. She already has saved \$150 in her savings account. Next week Mikaila will begin a tutoring job that pays \$10 per hour. All the money she earns tutoring will be added to her savings account.

Part A

What is the **total** amount of money Mikaila will have saved in her account after tutoring for 12 hours? Show or explain how you got your answer.

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

After Mikaila tutors for 12 hours, she will have a total amount of \$270 saved in her account.

Explanation: Since Mikaila gets \$10 each hour and she tutors for 12 hours, I multiplied 10 and 12. That got me to 120 and then I added the \$150 in her account to the \$120 that she earned for working 12 hours and I got \$270.

Part B

Write an expression to represent the **total** amount of money Mikaila will have saved in her account after tutoring for x hours.

Enter your expression in the space provided.

Expression: $10x + 150$

Explanation: The constant is 150 because she already had that saved in her bank account. Then, I put $10x$ with x representing the hours she worked and 10 represents how much she makes per hour.

Part C

The least expensive laptop that Mikaila is considering purchasing costs \$550, including tax.

Write and solve an inequality to determine the minimum number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs \$550 or more. Show or explain how you got your answer.

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

Mikaila needs to work a minimum of 40 hours to have enough money in her savings account to buy a \$550 laptop.

My inequality:

$$10x + 150 \geq 550$$

Subtract 150 on both sides, then you get: $10x \geq 400$.

Now you divide both sides by 10 and you get:

$$x \geq 40$$

Part D

The most expensive laptop that Mikaila is considering purchasing costs \$1,150, including tax.

Write and solve a **compound** inequality to determine the number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs at least \$550 but not more than \$1,150. Show or explain how you got your answer.

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

Mikaila needs to tutor for 40 or more hours but 100 or less hours to have enough money in her savings account to purchase a laptop that costs at least \$550 but not more than \$1,150.

My compound inequality:

$$550 \leq 10x + 150 \leq 1150$$

First, you subtract 150 from all parts of the equation.

$$\text{Now you have: } 400 \leq 10x \leq 1000$$

Then, divide everything by 10.

$$40 \leq x \leq 100$$

Score Point 4B

This question has four parts.

Mikaila is saving money to purchase a laptop computer. She already has saved \$150 in her savings account. Next week Mikaila will begin a tutoring job that pays \$10 per hour. All the money she earns tutoring will be added to her savings account.

Part A

What is the **total** amount of money Mikaila will have saved in her account after tutoring for 12 hours? Show or explain how you got your answer.

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

$150 + 10(12) = \$270$, After tutoring for 12 hours, Mikaila would have \$270 saved in her account. Mikaila began with \$150 and charges \$10 / hour for tutoring so, if she were to tutor for 12 hours, 10 times 12 equals \$120 that she made ontop of rher original 150

Part B

Write an expression to represent the **total** amount of money Mikaila will have saved in her account after tutoring for x hours.

Enter your expression in the space provided.

$$150 + 10x$$

Part C

The least expensive laptop that Mikaila is considering purchasing costs \$550, including tax.

Write and solve an inequality to determine the minimum number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs \$550 or more. Show or explain how you got your answer.

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

$$\begin{array}{r} 150 + 10x \geq 550 \\ -150 \qquad -150 \\ \hline 10x \geq 400 \\ \frac{10}{10}x \geq \frac{400}{10} \\ x \geq 40 \end{array}$$

Part D

The most expensive laptop that Mikaila is considering purchasing costs \$1,150, including tax.

Write and solve a **compound** inequality to determine the number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs at least \$550 but not more than \$1,150. Show or explain how you got your answer.

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

$$550 \leq 150 + 10x \leq 1150$$

$$\begin{array}{ccc} -150 & -150 & -150 \end{array}$$

$$400 \leq 10x \leq 1000$$

$$\frac{400}{10} \leq \frac{10}{10}x \leq \frac{1000}{10}$$

$$40 \leq x \leq 100$$

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Score Point 3

This question has four parts.

Mikaila is saving money to purchase a laptop computer. She already has saved \$150 in her savings account. Next week Mikaila will begin a tutoring job that pays \$10 per hour. All the money she earns tutoring will be added to her savings account.

Part A

What is the **total** amount of money Mikaila will have saved in her account after tutoring for 12 hours? Show or explain how you got your answer.

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

\$270

$$10x + 150$$

$$10(12) + 150$$

$$120 + 150$$

\$270

Part B

Write an expression to represent the **total** amount of money Mikaila will have saved in her account after tutoring for x hours.

Enter your expression in the space provided.

$$\text{total} = 10x + 150$$

Part C

The least expensive laptop that Mikaila is considering purchasing costs \$550, including tax.

Write and solve an inequality to determine the minimum number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs \$550 or more. Show or explain how you got your answer.

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

$$10x + 150 \geq 550$$

needs to tutor minimum of 40 hours

$$10x + 150 \geq 550$$

$$\quad - 150 \quad -150$$

$$10x \geq 400$$

(divide both sides by 10)

$$x \geq 40$$

Part D

The most expensive laptop that Mikaila is considering purchasing costs \$1,150, including tax.

Write and solve a **compound** inequality to determine the number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs at least \$550 but not more than \$1,150. Show or explain how you got your answer.

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

$$1150 \leq 10x + 150 \leq 550$$

needs to work 75 hours

$$1150 \leq 10x + 150 \leq 550$$

$$\quad - 150 \quad -150$$

$$1150 \leq 10x \leq 400$$

$$-400 \quad -400$$

$$750 \leq 10x$$

(divide both sides by 10)

$$75 \leq x$$

Score Point 2

This question has four parts.

Mikaila is saving money to purchase a laptop computer. She already has saved \$150 in her savings account. Next week Mikaila will begin a tutoring job that pays \$10 per hour. All the money she earns tutoring will be added to her savings account.

Part A

What is the **total** amount of money Mikaila will have saved in her account after tutoring for 12 hours? Show or explain how you got your answer.

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

$10 \cdot 12 + 150 = 270$ i got my answer because she makes 10 dollars an hour and she tutored for 12 hours so 12 times ten equals 120 plus the 150 in her account making 270\$

Part B

Write an expression to represent the **total** amount of money Mikaila will have saved in her account after tutoring for x hours.

Enter your expression in the space provided.

$$y = 10x + 150$$

Part C

The least expensive laptop that Mikaila is considering purchasing costs \$550, including tax.

Write and solve an inequality to determine the minimum number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs \$550 or more. Show or explain how you got your answer.

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

$550 \leq 10 \cdot x$
 $10 \cdot 55 = 550$
she will need 55 hours pf tutoring to buy the laptop
 $x = 55$

Part D

The most expensive laptop that Mikaila is considering purchasing costs \$1,150, including tax.

Write and solve a **compound** inequality to determine the number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs at least \$550 but not more than \$1,150. Show or explain how you got your answer.

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

$$550 \leq 10 \cdot x \leq 1,150$$

$1,150 \div 10 = 115$ so she would need 115 hours of tutoring to afford the most expensive laptop

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Score Point 1

This question has four parts.

Mikaila is saving money to purchase a laptop computer. She already has saved \$150 in her savings account. Next week Mikaila will begin a tutoring job that pays \$10 per hour. All the money she earns tutoring will be added to her savings account.

Part A

What is the **total** amount of money Mikaila will have saved in her account after tutoring for 12 hours? Show or explain how you got your answer.

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

There will be \$270 in her saving account.

$$\$10 \times 12 = \$120$$

$$\$120 + \$150 = \$270$$

Part B

Write an expression to represent the **total** amount of money Mikaila will have saved in her account after tutoring for x hours.

Enter your expression in the space provided.

$$\$10 \times x = \text{total}$$

Part C

The least expensive laptop that Mikaila is considering purchasing costs \$550, including tax.

Write and solve an inequality to determine the minimum number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs \$550 or more. Show or explain how you got your answer.

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

$$\$10x + 270 = 550$$

$$550 - 270 = 280$$

$$\frac{280}{10} = 28 \text{ hours}$$

With already \$270 dollars in her savings account she will only need 28 hour of tutoring to make enough for her laptop

Part D

The most expensive laptop that Mikaila is considering purchasing costs \$1,150, including tax.

Write and solve a **compound** inequality to determine the number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs at least \$550 but not more than \$1,150. Show or explain how you got your answer.

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

$$\$10x + 550 = 1150$$

$$1150 - 550 = 600$$

$$\frac{600}{10} = 60$$

$$x = 60 \text{ hour}$$

If she tutor for 60 hour she will have enough for the \$550 or the \$1,150.

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Score Point 0

This question has four parts.

Mikaila is saving money to purchase a laptop computer. She already has saved \$150 in her savings account. Next week Mikaila will begin a tutoring job that pays \$10 per hour. All the money she earns tutoring will be added to her savings account.

Part A

What is the **total** amount of money Mikaila will have saved in her account after tutoring for 12 hours? Show or explain how you got your answer.

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

she will have \$120 because she gets \$10 per hour and then I mutiplied that by 12.

Part B

Write an expression to represent the **total** amount of money Mikaila will have saved in her account after tutoring for x hours.

Enter your expression in the space provided.

$$10x + 12 = 150$$

Part C

The least expensive laptop that Mikaila is considering purchasing costs \$550, including tax.

Write and solve an inequality to determine the minimum number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs \$550 or more. Show or explain how you got your answer.

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

she will need to work for 55 hours because she gets paid \$10 per hour.
 $10x + 55 = 550$
That will get you 55 hours

Part D

The most expensive laptop that Mikaila is considering purchasing costs \$1,150, including tax.

Write and solve a **compound** inequality to determine the number of hours Mikaila needs to tutor to have enough money in her savings account to purchase a laptop that costs at least \$550 but not more than \$1,150. Show or explain how you got your answer.

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

$10x + 550 \leq \$1,150$ wich will get you 115 hours.

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