

# MeTEOR Performance Task

## Algebra I

Mathematics  
*Systems with Food*

### Main Food

KIDS BREAKFAST.....\$0.36

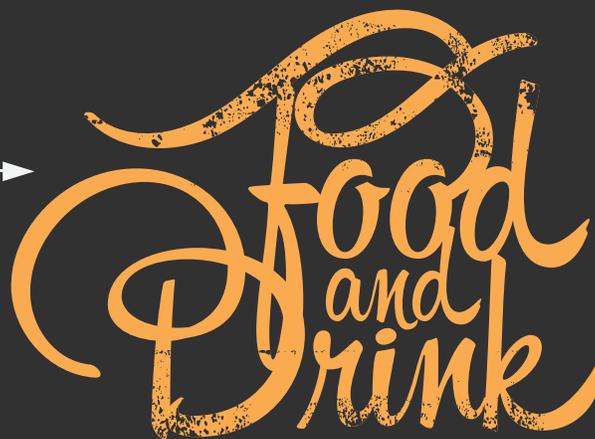
Lorem Ipsum is simply dummy text of the printing and typesetting industry.

KIDS BREAKFAST

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MENU RESTAURANT

### Desserts

KIDS BREAKFAST.....\$0.36

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### Sweet Food

KIDS BREAKFAST.....\$0.36

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KIDS BREAKFAST.....\$0.36

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### Hot Drinks and Juices

KIDS BREAKFAST.....\$0.36

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KIDS BREAKFAST.....\$0.36

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### Recommended Menu

Obtain a signed certificate. Obtaining a signed certificate involves creating a certificate signing request (CSR) and sending it to a CA in accordance with the CA's policy, and then conducting some checks on your company key, and sends you a validated certificate. See the instructions provided by the CA for more details.



CONNECTING THE DOTS

Lorem ipsum dolor sit amet

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## **Performance Task Item: Systems with Food Purchase**

*Grade Level: Algebra 1*

**Focus Area:** Systems of Equations

**Essential Question:** How do equations define real world problems?

**Core Ideas:**

- Understands properties for transforming equations.
- Understands how to create equations and inequalities in one variable and use them to solve problems.
- Understands how to create equations in two or more variables to represent relationships between quantities and finds solutions.
- Understands how to graph equations on coordinate axes.

**Learning Targets:**

- Students will write and solve equations including a system of equations given in a real-world situation.
- Students will graph a system of equations.
- Students will calculate solutions to systems of equations.
- Students will explain their reasoning.

## **STANDARDS**

**Domain: Algebra: Creating Equations**

**Content Standards:**

- Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions and simple rational, absolute and exponential functions.
- Create equations in two or more variables to represent relationships between quantities, graph equations on coordinate axes with labels and scales.
- Represent constraints by equations or inequalities and by systems of equations and/or inequalities and interpret solutions as viable or non-viable options in a modeling context.

**Supporting Standards:**

- Know precise definitions of equation's terminology.
- Know how to graph equations

**Math Practice Standards:**

MP 1: Make sense of problems and persevere in solving them.

MP 2: Reason abstractly and quantitatively.

MP 3: Construct viable arguments and critique the reasoning of others.

MP 4: Model with mathematics.

MP 6: Attend to precision.

MP 7: Look for and make use of structure.

**Materials:**

- Performance Task
- Pencil
- Paper
- Calculator
- Graph paper, if needed

**Task/Question 1:**

**DOK Level 1:** Recall & Reproduction

**Math Practice Standard:**

- MP 6: Attend to precision.

- A.** Write the definition of an equation:
- B.** Write the definition of a System of Equations:
- C.** Define a Solution to a System:

*Solve each of the following equations:*

**D.**  $25x + 7 = 107$  \_\_\_\_\_       $12x + 84 = 0$  \_\_\_\_\_       $\frac{1}{2}x - 7 = 17$  \_\_\_\_\_

$y = 2x$   
 $3x + y = 10$  \_\_\_\_\_

$5x + 2y = 24$   
 $4x + 3y = 29$  \_\_\_\_\_

- E.** The temperature in Spider Alley is  $38^{\circ}\text{C}$  and is dropping at a rate of 2 degrees per hour. The temperature in Snake Forge is  $23^{\circ}\text{C}$  and is going up at 3 degrees per hour. What is the temperature when both locations are the same?

**Task/Question 2:**

**DOK Level 1:** Recall & Reproduction

**Math Practice Standards:**

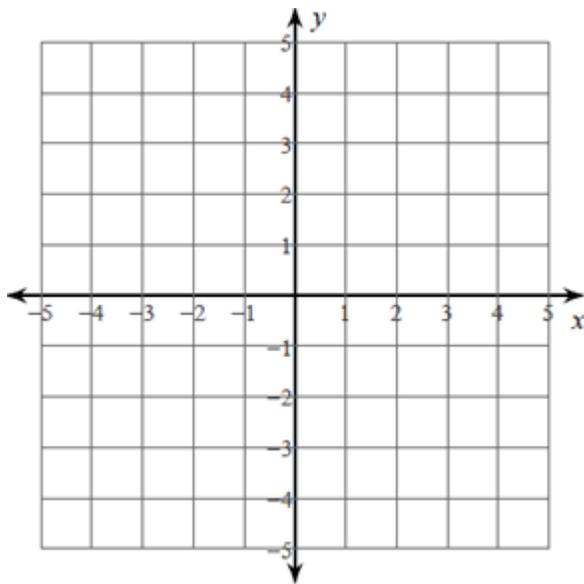
- MP 2: Reason abstractly and quantitatively.
- MP 6: Attend to precision.

**A.** Rewrite each equation in slope-intercept form:

$$-4x + y = 3$$

$$x + y = -2$$

**B.** Graph each equation from Part A on the graph below:



**C.** Write the solution to the system from the graph in Part B:

**Task/Question 3:**

**DOK Level 2:** Basic Application of Skills and Concepts

**Math Practice Standards:**

- MP 1: Make sense of problems and persevere in solving them.
- MP 2: Reason abstractly and quantitatively.
- MP 4: Model with mathematics.
- MP 6: Attend to precision.

You are helping to set prices for a new menu at a Taco Restaurant. The regular dinner has 3 chalupas and 2 tacos. The special dinner has 5 chalupas and 4 tacos. Let  $x$  be the number of cents charged for a chalupa and let  $y$  be the number of cents charged for a taco.

- A.** Write two expressions, one for the price of a regular dinner and the other for the price of a special dinner:

Regular dinner expression:

Special dinner expression:

- B.** If the cost of each chalupa was \$1.25 and the cost of each taco was \$.75 in Part A, how much would the dinners cost?

Regular dinner cost:

Special dinner cost:

- C.** Your manager says the cost of the dinners in Part B isn't enough money to cover the overhead costs and sets the regular dinner price to be \$9.56 and the special dinner price to be \$16.92. How much does each chalupa and taco cost based on these new prices?

Cost of a manager's chalupa:

Cost of manager's taco:

- D.** Explain how you knew how to find the cost of each item on the menu (from Part C):

**Task/Question 4:**

**DOK Level 3:** Strategic Thinking and Complex Reasoning

**Math Practice Standards:**

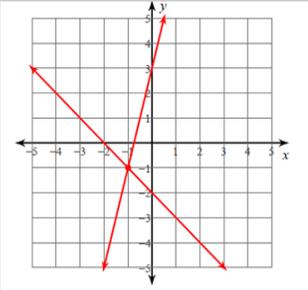
- MP 1: Make sense of problems and persevere in solving them.
- MP 2: Reason abstractly and quantitatively.
- MP 3: Construct viable arguments and critique the reasoning of others.
- MP 4: Model with mathematics.
- MP 7: Look for and make use of structure.

As the retired police officer visiting your local precinct, you volunteer to go out to get hamburgers and hotdogs for 23 people in the precinct. When you arrive at the hamburger stand, you suddenly forget how many hamburgers and hotdogs you are to buy. All you can remember is that each person only gets one hamburger or one hotdog and that they all gave you their money. You collected a total of \$32.10. Hamburgers cost \$1.50 each and hotdogs cost \$1.10 each. You decide you want a hamburger and toss in an extra \$1.50.

- A.** Write the system of equations needed to solve this problem:
- B.** Write the Solution to Part A:
- C.** After solving Part A, how many hamburgers and hotdogs were purchased?
- Number of hamburgers purchased:
- Number of hotdogs purchased:
- D.** How did you determine the system of equations needed to solve this problem? Justify and defend how your approach to solving this is the **most efficient**.

## Complete Performance Task Scoring Rubric Systems with Food

18-20 Proficient 16-17 Good 14-15 Satisfactory 12-13 Poor 0-11 Unsatisfactory

	Depth of Knowledge Level	Points	Total Possible Points for Task	Total Points Earned by Student
<p><b>Task 1:</b></p> <p>A. A sentence (such as <math>x + 3 = 5</math>) which says that one expression is equal to another expression.</p> <p>B. A system of equations is two or more equations with the same variables.</p> <p>C. A solution of a system of equations is an ordered pair that satisfies all the equations in the system.</p> <p>D. <math>x = 4</math>   <math>x = -7</math>   <math>x = 48</math>  <math>(2, 4)</math>   <math>(2, 7)</math></p> <p>E. <math>32^\circ</math></p>	<b>1</b>	<b>1</b>  <b>1</b>  <b>1</b>  <b>2</b>  <b>1</b>	<b>6</b>	
<p><b>Task 2:</b></p> <p>A. <math>y = 4x + 3</math>  <math>y = -x - 2</math></p> <p>B. Graphed</p>  <p>C. Solution: <math>(-1, -1)</math></p>	<b>1</b>	<b>2</b>  <b>1</b>  <b>1</b>	<b>4</b>	

<p><b>Task 3:</b></p> <p>A. <math>3x + 2y</math> <math>5x + 4y</math></p> <p>B. \$5.25 \$9.25</p> <p>C. Chalupa = \$2.20 each Taco = \$1.48 each</p> <p>D. Answers will vary. Possible Explanation: "I know using two equations with two variables is a system. Since I know how many chalupas and tacos are in each dinner along with the prices of each dinner, I can use several ways to solve – either by using substitution, elimination or graphing. I used the elimination method to find out the price of a taco. Then, I substituted the value into the equation to solve for the cost of the chalupa."</p>	<p><b>2</b></p>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>2</b></p>	<p><b>5</b></p>	
<p><b>Task 4:</b></p> <p>A. <math>x + y = 24</math> <math>\\$1.50x + \\$1.10y = \\$33.60</math></p> <p>B. (18, 6)</p> <p>C. Answers will vary. Possible Explanation: "If There were 23 people plus the retired officer that would make a total of 24 people getting hamburgers and hotdogs. The retired officer collected \$32.10, but tossed in an addition \$1.50 for his hamburger. That gave him a new total of \$33.60. Since there are two equations and two variables, this is a system of equations that can be set up and solved. While there are several methods in solving</p>	<p><b>3</b></p>	<p><b>2</b></p> <p><b>1</b></p> <p><b>2</b></p>	<p><b>5</b></p>	

this problem, I chose the elimination method. I set up the system and solved by finding out the number of hotdogs to be purchased first. Then, I was able to substitute that number into the equation to solve for the number of hamburgers purchased.”				
<b>TOTAL POINTS:</b>				



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