

*A.A.7: Analyze and solve verbal problems whose solution requires solving systems of linear equations in two variables.*

1. fall0708ia, P.I. A.A.7

The equations  $5x + 2y = 48$  and  $3x + 2y = 32$  represent the money collected from school concert ticket sales during two class periods. If  $x$  represents the cost for each adult ticket and  $y$  represents the cost for each student ticket, what is the cost for each adult ticket?

[A] \$8      [B] \$20      [C] \$10      [D] \$4

2. 060912ia, P.I. A.A.7

The sum of two numbers is 47, and their difference is 15. What is the larger number?

[A] 16      [B] 32      [C] 31      [D] 36

3. 060806ia, P.I. A.A.7

Jack bought 3 slices of cheese pizza and 4 slices of mushroom pizza for a total cost of \$12.50. Grace bought 3 slices of cheese pizza and 2 slices of mushroom pizza for a total cost of \$8.50. What is the cost of one slice of mushroom pizza?

[A] \$3.50                      [B] \$2.00  
[C] \$3.00                      [D] \$1.50

4. 080837ia, P.I. A.A.7

The cost of 3 markers and 2 pencils is \$1.80. The cost of 4 markers and 6 pencils is \$2.90. What is the cost of *each* item? Include appropriate units in your answer.

5. 080233a, P.I. A.A.7

Tanisha and Rachel had lunch at the mall. Tanisha ordered three slices of pizza and two colas. Rachel ordered two slices of pizza and three colas. Tanisha's bill was \$6.00, and Rachel's bill was \$5.25. What was the price of one slice of pizza? What was the price of one cola?

6. 010232a, P.I. A.A.7

When Tony received his weekly allowance, he decided to purchase candy bars for all his friends. Tony bought three Milk Chocolate bars and four Creamy Nougat bars, which cost a total of \$4.25 without tax. Then he realized this candy would not be enough for all his friends, so he returned to the store and bought an additional six Milk Chocolate bars and four Creamy Nougat bars, which cost a total of \$6.50 without tax. How much did *each* type of candy bar cost?

7. 010332a, P.I. A.A.7

Alexandra purchases two doughnuts and three cookies at a doughnut shop and is charged \$3.30. Briana purchases five doughnuts and two cookies at the same shop for \$4.95. All the doughnuts have the same price and all the cookies have the same price. Find the cost of one doughnut and find the cost of one cookie.

8. 060133a, P.I. A.A.7

Ramón rented a sprayer and a generator. On his first job, he used each piece of equipment for 6 hours at a total cost of \$90. On his second job, he used the sprayer for 4 hours and the generator for 8 hours at a total cost of \$100. What was the hourly cost of *each* piece of equipment?

NAME: \_\_\_\_\_

9. 010033a, P.I. A.A.7  
A group of 148 people is spending five days at a summer camp. The cook ordered 12 pounds of food for each adult and 9 pounds of food for each child. A total of 1,410 pounds of food was ordered.  
*a* Write an equation or a system of equations that describes the above situation and define your variables.  
*b* Using your work from part *a*, find:  
(1) the total number of adults in the group  
(2) the total number of children in the group
10. 060031a, P.I. A.A.7  
The owner of a movie theater was counting the money from 1 day's ticket sales. He knew that a total of 150 tickets were sold. Adult tickets cost \$7.50 each and children's tickets cost \$4.75 each. If the total receipts for the day were \$891.25, how many of *each* kind of ticket were sold?
11. 010134a, P.I. A.A.7  
There were 100 more balcony tickets than main-floor tickets sold for a concert. The balcony tickets sold for \$4 and the main-floor tickets sold for \$12. The total amount of sales for both types of tickets was \$3,056.  
*a* Write an equation or a system of equations that describes the given situation. Define the variables.  
*b* Find the number of balcony tickets that were sold.
12. 010539a, P.I. A.A.7  
The tickets for a dance recital cost \$5.00 for adults and \$2.00 for children. If the total number of tickets sold was 295 and the total amount collected was \$1,220, how many adult tickets were sold? [Only an algebraic solution can receive full credit.]
13. 060638a, P.I. A.A.7  
Sharu has \$2.35 in nickels and dimes. If he has a total of thirty-two coins, how many of *each* coin does he have?
14. 010228b, P.I. A.A.7  
At the local video rental store, José rents two movies and three games for a total of \$15.50. At the same time, Meg rents three movies and one game for a total of \$12.05. How much money is needed to rent a combination of one game and one movie?
15. 060123b, P.I. A.A.7  
The cost of a long-distance telephone call is determined by a flat fee for the first 5 minutes and a fixed amount for each additional minute. If a 15-minute telephone call costs \$3.25 and a 23-minute call costs \$5.17, find the cost of a 30-minute call.

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[1] A

[2] C

[3] B

[4] A marker = \$.50 or 50¢ and a pencil = \$.15 or 15¢, and appropriate work is shown, such as solving a system of equations algebraically or by trial and error with at least three trials and appropriate checks.

[3] Appropriate work is shown, but one computational error is made.

[3] Appropriate work is shown, but only the cost of a marker or a pencil is found, but appropriate units are written.

or [3] Appropriate work is shown, but the correct answers are not labeled or are labeled incorrectly, but appropriate units are written.

or [3] Appropriate work is shown, and the answers are labeled correctly, but the units are written incorrectly, such as a marker = .50¢.

[2] Appropriate work is shown, but two or more computational errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] Appropriate work is shown, but the answers are not labeled or are labeled incorrectly, and the units are not written or are written incorrectly.

or [2] An incorrect system of equations is written, but two appropriate answers are found and labeled, and appropriate units are written.

or [2] The trial-and-error method is used to find the correct answers, but only two trials and appropriate checks are shown.

or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no answers are found.

[1] Appropriate work is shown, but one conceptual error and one computational error

[4] are made.

or [1] A correct system of equations is written, but no further correct work is shown.

or [1] The trial-and-error method is used to find the correct answers, but only one trial with an appropriate check is shown.

or [1] A marker = \$.50 or 50¢ and a pencil = \$.15 or 15¢, but no work is shown.

[0] One correct equation is written, but no further correct work is shown.

or [0] Either the correct price of a marker or a pencil is stated, but no work is shown.

or [0] The correct prices of the marker and pencil are found, but no work is shown, and the answers are not labeled or are labeled incorrectly.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[4] \$1.50 for one slice of pizza and \$0.75 for one cola, and appropriate work is shown, such as  $3x + 2y = \$6$  and  $2x + 3y = \$5.25$ .

[3] Appropriate work is shown, but one computational error is made.

or [3] Appropriate work is shown, but only the price of one slice of pizza or the price of one cola is found correctly.

[2] Appropriate work is shown, but more than one computational error is made.

or [2] An incorrect system of equations of equal difficulty is solved appropriately to calculate the cost of one slice of pizza and one cola.

[1] \$1.50 for one slice of pizza and \$0.75 for one cola, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[5] incorrect procedure.

[4] Milk Chocolate bar = \$0.75 and Creamy Nougat bar = \$0.50, and appropriate work is shown, such as equations, a trial-and-error method with at least two trials and appropriate checks, or an algebraic or graphic solution.

[3] Appropriate work is shown, but one computational error is made.

[2] The cost of one candy bar is determined correctly with appropriate work shown, but no attempt is made to find the cost of the other candy bar.

or [2] Appropriate work is shown, but more than one computational error is made.

[1] Appropriate work is shown, but no answer is found.

or [1] Milk Chocolate bar = \$0.75 and Creamy Nougat bar = \$0.50, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[6] incorrect procedure.

[4] One doughnut is \$0.75 and one cookie is \$0.60, and appropriate work is shown, such as a system of equations, trial and error with at least three trials and appropriate checks, or a table.

[3] Appropriate work is shown, but one computational error is made.

or [3] Appropriate work is shown, but only one correct answer is found, or two correct answers are found, but they are not identified clearly as doughnuts or cookies, or the doughnuts and cookies are labeled incorrectly.

[2] Appropriate work is shown, but more than one computational error is made.

or [2] Two equations are written, one correct and one incorrect, but two appropriate answers are found.

or [2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.

[1] Two correct equations are written, but no further correct work is shown.

or [1] One doughnut is \$0.75 and one cookie is \$0.60, but no work or only one trial with an appropriate check is shown.

[0] One correct equation is shown, and no answer or only one appropriate answer is found.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[7] obviously incorrect procedure.

- [4] \$5 for the sprayer and \$10 for the generator, and appropriate work is shown, such as  $x$ =hourly cost of sprayer and  $y$ =hourly cost of generator, and an appropriate system of equations is solved or a trial-and-error method is used, showing at least two trials with appropriate checks.
- [3] Both correct equations are shown or an appropriate chart or trial-and-error method is used, but one computational error is made.
- or [3] Both correct equations are shown, and they are solved for one value, but no further work is shown.
- [2] Only one of the two equations is correct, but they are solved appropriately for both values.
- or [2] Both correct equations are shown, but more than one computational error is made.
- or [2] \$5 for the sprayer and \$10 for the generator, but only one trial is shown with appropriate checks.
- [1] Both equations are incorrect, but they are solved appropriately for both values.
- or [1] Both correct equations are shown, but they are not solved.
- or [1] \$5 for the sprayer and \$10 for the generator, but no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
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- [8] \_\_\_\_\_

- a [2] An appropriate equation or system is shown, such as  $x + y = 148$  and  $12x + 9y = 1410$  or one equation such as  $12(148 - x) + 9x = 1410$  with variables identified.
- [1] The student shows appropriate equation(s), but variables are not defined.
- or [1] One mistake in equation(s) is made, or only one equation with two variables is shown, but variables are defined.
- b(1) [1] 26 and an appropriate method is shown, such as solving the equation or making a table.
- or [1] An appropriate answer is found based on incorrect equation(s) obtained in part a.
- b(2) [1] 122 and an appropriate method is shown, such as  $148 - 26$ .
- or [1] An appropriate answer is found based on incorrect equation(s) obtained in part a.
- b (1) and b (2) [1] 26 and 122 and no work is shown.
- a and b [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
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- [9] \_\_\_\_\_
- [4] 65 adult tickets and 85 student tickets and an appropriate equation is shown, such as  $7.50x + 4.75(150 - x) = 891.25$ , or any other acceptable method is used.
- [3] Either 65 or 85 and appropriate work is shown.
- or [3] Appropriate work is shown, but one computational error is made that leads to two appropriate answers.
- [2] An incorrect equation is shown, but it is solved appropriately for two answers.
- or [2] The correct equation is shown, but two computational errors are made.
- [1] Appropriate work is shown, but no answer is found.
- or [1] 65 and 85 but no work is shown.
- [0] Either 65 or 85 and no work is shown.
- or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
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- [10] \_\_\_\_\_

- a [2] The student writes an appropriate system of equations, such as  $b = f + 100$  and  $4b + 12f = 3,056$ , and defines the variables.  
or [2] The student writes an appropriate equation, such as  $4(100 + x) + 12x = 3,056$ , and defines the variable.
- [1] A correct equation or correct equations are shown, but the variables are not defined.  
or [1] One error is made in the setup, such as  $b + f = 100$ .
- [0] The student only defines the variables.
- b [2] 266, and appropriate work is shown, using an algebraic solution or a correct trial-and-error method.  
or [2] Appropriate work is shown for an incorrect part a equation or system of equations.
- [1] Work is shown, but the answer is inappropriate, such as \$1,064.  
or [1] 266, but no work is shown.
- a and b [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [11] \_\_\_\_\_

- [4] 210, and appropriate work is shown, such as a system of equations or the linear equation  $5x + 2(295 - x) = 1,220$ .
- [3] Appropriate work is shown, but one computational error is made.  
or [3] Appropriate work is shown, but the number of children's tickets is found as the answer.
- [2] Appropriate work is shown, but two or more computational errors are made.  
or [2] Appropriate work is shown, but one conceptual error is made.  
or [2] An incorrect equation of equal difficulty is solved appropriately.  
or [2] 210, but a method other than an algebraic solution is used.
- [1] Appropriate work is shown, but one conceptual error and one computational error are made.  
or [1] The correct system of equations or linear equation is written, but no further correct work is shown.  
or [1] 210, but no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [12] \_\_\_\_\_

- [4] 17 nickels and 15 dimes, and appropriate work is shown, such as the equation  $0.05x + 0.10(32 - x) = 2.35$  or trial and error with at least three trials and appropriate checks.
- [3] Appropriate work is shown, but one computational error is made.
- or [3] Appropriate work is shown, and the correct answers are found, but they are not labeled or are labeled incorrectly.
- or [3] Appropriate work is shown, but only the correct number of nickels or the correct number of dimes is found and labeled.
- [2] Appropriate work is shown, but two or more computational errors are made.
- or [2] Appropriate work is shown, but one conceptual error is made.
- or [2] The trial-and-error method is used to find the correct solution, but only two trials and appropriate checks are shown.
- or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.
- or [2] An incorrect system of equations of equal difficulty is solved appropriately for both the number of nickels and dimes.
- or [2] A correct equation is solved for  $x$ , but no further correct work is shown.
- [1] Appropriate work is shown, but one conceptual error and one computational error are made.
- or [1] A correct equation is written, but no further correct work is shown.
- or [1] 17 nickels and 15 dimes, but no work or only one trial with an appropriate check is shown.
- [0] 17 nickels or 15 dimes, but no work or only one trial with an appropriate check is shown.
- or [0] 17 and 15, but no work is shown, and the answers are not labeled or are labeled incorrectly.
- or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [13] obviously incorrect procedure.
- [4] \$6.15, and appropriate work is shown, such as solving simultaneous equations or using a trial-and-error method.
- [3] \$2.95 (movie) and \$3.20 (game) are found, but they are not added.
- or [3] Appropriate work is shown, but one computational error is made.
- [2] The system of equations is set up correctly, but one conceptual error leads to an appropriate solution.
- or [2] \$2.95 (movie) or \$3.20 (game), and appropriate work is shown.
- [1] \$6.15, but no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [14] incorrect procedure.
- [2] \$6.85, and appropriate work is shown.
- [1] The correct rate for the first 5 minutes and the correct rate for each additional minute is shown, but the cost of a 30-minute call is not found.
- or [1] Appropriate work is shown, but one computational error is made.
- or [1] \$6.85, but no work is shown.
- [0] The student calculates either the rate for the first 5 minutes or the rate for each additional minute, but no further work is shown.
- or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [15] obviously incorrect procedure.