pennsylvania
DEPARTMENT OF EDUCATION

PENNSYLVANIA
KEYSTONE EXAMS

Algebra I

Item and Scoring Sampler

2018

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INTRODUCTION

General Introduction

The Pennsylvania Department of Education (PDE) provides districts and schools with tools to assist in delivering focused instructional programs aligned to the Pennsylvania Core Standards. These tools include the standards, assessment anchor documents, Keystone Exams Test Definition, Classroom Diagnostic Tool, Standards Aligned System, and content-based item and scoring samplers. This 2018 Algebra I Item and Scoring Sampler is a useful tool for Pennsylvania educators in preparing students for the Keystone Exams.

This Item and Scoring Sampler contains released operational multiple-choice and constructed-response items that have appeared on previously administered Keystone Exams. These items will not appear on any future Keystone Exams. Released items provide an idea of the types of items that have appeared on operational exams and that will appear on future operational Keystone Exams. Each item has been through a rigorous review process to ensure alignment with the Assessment Anchors and Eligible Content. This sampler includes items that measure a variety of Assessment Anchor or Eligible Content statements, but it does not include sample items for all Assessment Anchor or Eligible Content statements.

The items in this sampler may be used as examples for creating assessment items at the classroom level and may also be copied and used as part of a local instructional program.[1] Classroom teachers may find it beneficial to have students respond to the constructed-response items in this sampler. Educators can then use the sampler as a guide to score the responses either independently or together with colleagues.

This Item and Scoring Sampler is available in Braille format. For more information regarding Braille call (717)-901-2238.

ABOUT THE KEYSTONE EXAMS

The Keystone Exams are end-of-course assessments currently designed to assess proficiencies in Algebra I, Biology, and Literature. For detailed information about how the Keystone Exams are being integrated into the Pennsylvania graduation requirements, please contact the Pennsylvania Department of Education or visit the PDE website at http://www.education.pa.gov.

Alignment

The Algebra I Keystone Exam consists of exam questions grouped into **two modules**:
Module 1—Operations and Linear Equations & Inequalities, and Module 2—Linear Functions and Data Organizations. Each module corresponds to specific content, aligned to statements and specifications included in the course-specific assessment anchor documents. The Algebra I content included in the Keystone Algebra I multiple-choice items will align with the Assessment Anchors as defined by the Eligible Content statements. The process skills, directives, and action statements will also specifically align with the Assessment Anchors as defined by the Eligible Content statements.

The content included in Algebra I constructed-response items aligns with content included in the Eligible Content statements. The process skills, directives, and action statements included in the performance demands of the Algebra I constructed-response items align with specifications included in the Assessment Anchor statements, the Anchor Descriptor statements, and/or the Eligible Content statements. In other words, the verbs or action statements used in the constructed-response items or stems can come from the Eligible Content, Anchor Descriptor, or Assessment Anchor statements.

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[1] The permission to copy and/or use these materials does not extend to commercial purposes.

Depth of Knowledge

Webb's Depth of Knowledge (DOK) was created by Dr. Norman Webb of the Wisconsin Center for Education Research. Webb's definition of depth of knowledge is the cognitive expectation demanded by standards, curricular activities, and assessment tasks. Webb's DOK includes four levels, from the lowest (basic recall) level to the highest (extended thinking) level.

Depth of Knowledge	
Level 1	Recall
Level 2	Basic Application of Skill/Concept
Level 3	Strategic Thinking
Level 4	Extended Thinking

Each Keystone item has been through a rigorous review process and is assigned a DOK level. For additional information about depth of knowledge, please visit the PDE website at http://static.pdesas.org/Content/Documents/Keystone_Exam_Program_Overview.pdf.

Exam Format

The Keystone Exams are delivered in a paper-and-pencil format as well as in a computer-based online format. The multiple-choice items require students to select the best answer from four possible answer options and record their answers in the spaces provided. The correct answer for each multiple-choice item is worth one point. The constructed-response items require students to develop and write (or construct) their responses. Constructed-response items in Algebra I are scored using item-specific scoring guidelines based on a 0–4-point scale. Each multiple-choice item is designed to take about one to one-and-a-half minutes to complete. Each constructed-response item is designed to take about 10 minutes to complete. The estimated time to respond to a test question is the same for both test formats. During an actual exam administration, students are given additional time as necessary to complete the exam.

ITEM AND SCORING SAMPLER FORMAT

This sampler includes the test directions, scoring guidelines, and formula sheet that appear in the Keystone Exams. Each sample multiple-choice item is followed by a table that includes the alignment, the answer key, the DOK, the percentage[2] of students who chose each answer option, and a brief answer option analysis or rationale. Each constructed-response item is followed by a table that includes the alignment, the DOK, and the mean student score. Additionally, each of the included item-specific scoring guidelines is combined with sample student responses representing each score point to form a practical, item-specific scoring guide. The *General Description of Scoring Guidelines for Algebra I* used to develop the item-specific scoring guidelines should be used if any additional item-specific scoring guidelines are created for use within local instructional programs.

Example Multiple-Choice Item Information Table

Item Information	
Alignment	Assigned AAEC
Answer Key	Correct Answer
Depth of Knowledge	Assigned DOK
p-value A	Percentage of students who selected each option
p-value B	Percentage of students who selected each option
p-value C	Percentage of students who selected each option
p-value D	Percentage of students who selected each option
Option Annotations	Brief answer option analysis or rationale

Example Constructed-Response Item Information Table

Alignment	Assigned AAEC	**Depth of Knowledge**	Assigned DOK	**Mean Score**	

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[2] All *p*-value percentages listed in the item information tables have been rounded.

ALGEBRA I EXAM DIRECTIONS

Directions:

Below are the exam directions available to students. These directions may be used to help students navigate through the exam.

Formulas that you may need to solve questions in this module are found on page 7 of this test booklet. You may refer to the formula page at any time during the exam.

You may use a calculator on this module. When performing operations with π (pi), you may use either calculator π or the number 3.14 as an approximation of π.

There are two types of questions in each module.

Multiple-Choice Questions:

These questions will ask you to select an answer from among four choices.

- First read the question and solve the problem on scratch paper. Then choose the correct answer.
- Only one of the answers provided is correct.
- If none of the choices matches your answer, go back and check your work for possible errors.
- Record your answer in the Algebra I answer booklet.

Constructed-Response Questions:

These questions will require you to write your response.

- These questions have more than one part. Be sure to read the directions carefully.
- You cannot receive the highest score for a constructed-response question without completing all the tasks in the question.
- If the question asks you to show your work or explain your reasoning, be sure to show your work or explain your reasoning. However, not all questions will require that you show your work or explain your reasoning. If the question does not require that you show your work or explain your reasoning, you may use the space provided for your work or reasoning, but the work or reasoning will not be scored.
- All responses must be written in the appropriate location within the response box in the Algebra I answer booklet. Some answers may require graphing, plotting, labeling, drawing, or shading. If you use scratch paper to write your draft, be sure to transfer your final response to the Algebra I answer booklet.

If you finish early, you may check your work in Module 1 [or Module 2] only.

- Do not look ahead at the questions in Module 2 of your exam materials.
- After you have checked your work, close your exam materials.

You may refer to this page at any time during this portion of the exam.

GENERAL DESCRIPTION OF SCORING GUIDELINES FOR ALGEBRA I

4 Points

- The response demonstrates a *thorough* understanding of the mathematical concepts and procedures required by the task.

- The response provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor "blemish" or omission in work or explanation that does not detract from demonstrating a thorough understanding.

3 Points

- The response demonstrates a *general* understanding of the mathematical concepts and procedures required by the task.

- The response and explanation (as required by the task) are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a general understanding.

2 Points

- The response demonstrates a *partial* understanding of the mathematical concepts and procedures required by the task.

- The response is somewhat correct with partial understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

1 Point

- The response demonstrates a *minimal* understanding of the mathematical concepts and procedures required by the task.

0 Points

- The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures required by the task.

    Special Categories within zero reported separately:

    Blank....................................Blank, entirely erased, entirely crossed out, or consists entirely of whitespace

    Refusal................................Refusal to respond to the task

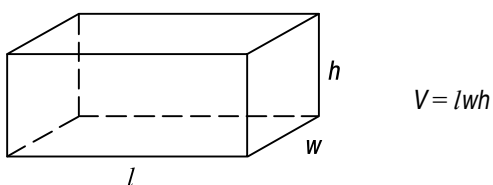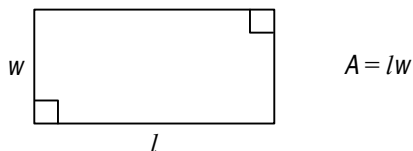   **Off Task**...............................Makes no reference to the item but is not an intentional refusal

    Foreign Language................Written entirely in a language other than English

    Illegible ....Illegible or incoherent

FORMULA SHEET

Formulas that you may need to solve questions on this exam are found below.

You may use calculator π or the number 3.14 as an approximation of π.

$A = lw$

$V = lwh$

Linear Equations

Slope: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Point-Slope Formula: $(y - y_1) = m(x - x_1)$

Slope-Intercept Formula: $y = mx + b$

Standard Equation of a Line: $Ax + By = C$

Arithmetic Properties

Additive Inverse: $a + (\bar{\ }a) = 0$

Multiplicative Inverse: $a \cdot \dfrac{1}{a} = 1$

Commutative Property: $a + b = b + a$
$a \cdot b = b \cdot a$

Associative Property: $(a + b) + c = a + (b + c)$
$(a \cdot b) \cdot c = a \cdot (b \cdot c)$

Identity Property: $a + 0 = a$
$a \cdot 1 = a$

Distributive Property: $a \cdot (b + c) = a \cdot b + a \cdot c$

Multiplicative Property of Zero: $a \cdot 0 = 0$

Additive Property of Equality:
If $a = b$, then $a + c = b + c$

Multiplicative Property of Equality:
If $a = b$, then $a \cdot c = b \cdot c$

ALGEBRA I MODULE 1
Multiple-Choice Items

1. Four values are listed below.

$$\frac{1}{7} \qquad 20\% \qquad \sqrt{0.5} \qquad |{-0.5}|$$

Which list shows the values in order from **least** to **greatest**?

A. $|{-0.5}|$ $\sqrt{0.5}$ $\frac{1}{7}$ 20%

B. $|{-0.5}|$ $\frac{1}{7}$ 20% $\sqrt{0.5}$

C. $\frac{1}{7}$ 20% $|{-0.5}|$ $\sqrt{0.5}$

D. $\frac{1}{7}$ $\sqrt{0.5}$ $|{-0.5}|$ 20%

Item Information	
Alignment	A1.1.1.1.1
Answer Key	C
Depth of Knowledge	1
p-value A	14%
p-value B	17%
p-value C	60% (correct answer)
p-value D	9%
Option Annotations	A student could determine the **correct** answer, option C, by converting the numbers to their rational approximations and then ordering the rational approximations from least to greatest. A student could arrive at an **incorrect** answer by converting the numbers to an incorrect approximation or by misinterpreting what the numbers represent. For example, a student could arrive at option B by not applying the absolute value bars and treating |−0.5| as equal to −0.5.

2. An inequality is shown below.

$$4(ab)^3 > 15a^3b$$

Which values of a and b make the inequality true?

A. $a = 1$
       $b = 1$

B. $a = 1$
       $b = 2$

C. $a = 2$
       $b = 0$

D. $a = 2$
       $b = 1$

Item Information	
Alignment	A1.1.1.3.1
Answer Key	B
Depth of Knowledge	1
p-value A	11%
p-value B	62% (correct answer)
p-value C	13%
p-value D	14%
Option Annotations	A student could determine the **correct** answer, option B, by simplifying the inequality to $b^2 > \dfrac{15}{4}$ and identifying a positive value for b that makes the simplified inequality true. A student could arrive at an **incorrect** answer by incorrectly evaluating the inequality. For example, a student could arrive at option D by substituting 21 for ab on the left-hand side.

3. An equation involving polynomials is shown below.

$$(ax + 5y) + (x - y) - (3x - by) = 2x + y$$

What are the values of *a* and *b*?

A. $a = 4$
$b = {}^-3$

B. $a = 4$
$b = 3$

C. $a = 5$
$b = {}^-5$

D. $a = 5$
$b = 5$

Item Information	
Alignment	A1.1.1.5.1
Answer Key	A
Depth of Knowledge	2
p-value A	41% (correct answer)
p-value B	31%
p-value C	17%
p-value D	11%
Option Annotations	A student could determine the **correct** answer, option A, by distributing the subtraction through the third binomial, combining like terms, and simplifying the equation to $ax + by = 4x + {}^-3y$.

A student could arrive at an **incorrect** answer by incorrectly simplifying the equation. For example, a student could arrive at option B by not distributing the negative symbol across negative *by* and simplifying the equation involving the *y* terms to $3y = by$. |

4. Simplify:

$$\frac{3x^2 + 3x - 6}{6x^2 + 18x + 12}; x \neq {}^-2, {}^-1$$

A. $\frac{1}{10}$

B. $\frac{1}{2}$

C. $\frac{x - 1}{2(x + 1)}$

D. $\frac{2(x - 1)}{x + 1}$

Item Information	
Alignment	A1.1.1.5.3
Answer Key	C
Depth of Knowledge	1
p-value A	11%
p-value B	22%
p-value C	51% (correct answer)
p-value D	16%
Option Annotations	A student could determine the **correct** answer, option C, by factoring the numerator to $3(x - 1)(x + 2)$, factoring the denominator to $6(x + 1)(x + 2)$, and then canceling out the common factors: 3 and $(x + 2)$. A student could arrive at an **incorrect** answer by incorrectly factoring the numerator and/or denominator. For example, a student could arrive at option B by factoring the numerator as $3(x + 1)(x + 2)$.

5. Joan has a gym gift card worth $100. Each time she visits the gym, $12 is deducted from the amount remaining on the gift card. Which equation can be used to determine the amount of money (*m*), in dollars, remaining on the gift card after Joan visits the gym *d* times?

    A. $m = 12 - 100d$

    B. $m = 12d - 100$

    C. $m = {}^-12 + 100d$

    D. $m = {}^-12d + 100$

Item Information	
Alignment	A1.1.2.1.1
Answer Key	D
Depth of Knowledge	2
p-value A	7%
p-value B	39%
p-value C	4%
p-value D	50% (correct answer)
Option Annotations	A student could determine the **correct** answer, option D, by identifying 100 as the initial value, ⁻12 as the rate of change, and that the rate of change should be multiplied by the variable *d*. A student could arrive at an **incorrect** answer by placing the variable with the incorrect value and/or by misidentifying which term should be subtracted. For example, a student could arrive at option B by subtracting the 100 instead of the 12*d*.

6. The equation below describes the relationship between the number of months (*x*) since a customer began renting a storage unit and the total amount of money (*y*), in dollars, the customer has paid to the storage facility.

$$y = 15x + 30$$

Which statement describes a solution of the equation based on the number of months the customer has rented the storage unit?

A.   After exactly 16 months, the customer has paid $240.

B.   After exactly 240 months, the customer has paid $16.

C.   After exactly 16 months, the customer has paid $270.

D.   After exactly 270 months, the customer has paid $16.

Item Information	
Alignment	A1.1.2.1.3
Answer Key	C
Depth of Knowledge	2
p-value A	14%
p-value B	4%
p-value C	80% (correct answer)
p-value D	2%
Option Annotations	A student could determine the **correct** answer, option C, by identifying (16, 270) as a possible solution, identifying the 16 as the number of months, and identifying the 270 as the amount the customer has paid. A student could arrive at an **incorrect** answer by not including the "+ 30" and/or by interpreting the values incorrectly. For example, a student could arrive at option A by using $y = 15x$ but correctly interpreting that 16 represents the number of months.

7. Charlene owns a bookstore. She purchases used books from customers.

- She pays $3.50 for each hardback book.
- She pays $0.75 for each paperback book.
- Charlene pays a customer a total of $199.75 for 149 used books.

Which system of equations could be used to determine the number of hardback books (x) and the number of paperback books (y) Charlene purchases from the customer?

A. $x + y = 199.75$
      $0.75x + 3.50y = 149$

B. $x + y = 149$
      $0.75x + 3.50y = 199.75$

C. $x + y = 199.75$
      $3.50x + 0.75y = 149$

D. $x + y = 149$
      $3.50x + 0.75y = 199.75$

Item Information	
Alignment	A1.1.2.2.1
Answer Key	D
Depth of Knowledge	2
p-value A	5%
p-value B	10%
p-value C	12%
p-value D	73% (correct answer)
Option Annotations	A student could determine the **correct** answer, option D, by identifying that x and y represent the number of books purchased so their sum must be 149 and by identifying that the expression 3.50x represents paying $3.50 for each hardback book and that the expression 0.75y represents paying $0.75 for each paperback book so the sum of these expressions must be 199.75. A student could arrive at an **incorrect** answer by switching the total amount paid with the total number of books and/or switching the coefficients for x and y in the second equation. For example, a student could arrive at option C by switching the total amount paid with the total number of books.

8. Gloria is considering two different movie services.

    - Service A charges a $15.00 monthly fee for unlimited streaming of movies and $2.50 per DVD rental.

    - Service B charges a $12.00 monthly fee for unlimited streaming of movies and $3.50 per DVD rental.

    The system of equations below describes the relationship between the number of DVDs rented per month (x) and the monthly cost (y), in dollars, for both services.

    $$y = 15.00 + 2.50x$$

    $$y = 12.00 + 3.50x$$

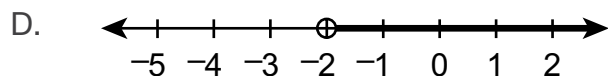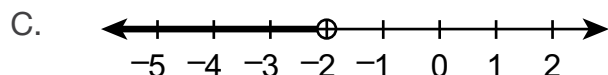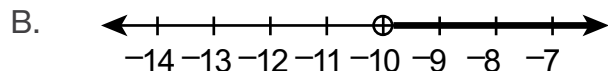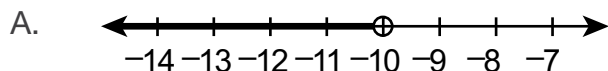   Which statement about the costs of the movie services is true?

    A. When Gloria rents 3 DVDs per month, either service will cost her $22.50 per month.

    B. When Gloria rents 6 DVDs per month, either service will cost her $27.00 per month.

    C. When Gloria rents fewer than 3 DVDs per month, service A will cost less per month than service B will cost.

    D. When Gloria rents more than 3 DVDs per month, service B will cost $12 more per month than service A will cost.

Item Information	
Alignment	A1.1.2.2.2
Answer Key	A
Depth of Knowledge	2
p-value A	77% (correct answer)
p-value B	5%
p-value C	12%
p-value D	6%
Option Annotations	A student could determine the **correct** answer, option A, by determining the solution for the system of equations is (3, 22.50) and interpreting that ordered pair as the point for which both services will cost the same amount. A student could arrive at an **incorrect** answer by incorrectly interpreting what the variables represent. For example, a student could arrive at option C by considering only the 2.50 and 3.50 which would lead to Service A always costing less.

9. An inequality is shown below.

$$5x - 6 < 4 + 6x$$

Which is a graph of the solution set of the inequality?

A.

$-14 \; -13 \; -12 \; -11 \; -10 \; -9 \; -8 \; -7$

B.

$-14 \; -13 \; -12 \; -11 \; -10 \; -9 \; -8 \; -7$

C.

$-5 \; -4 \; -3 \; -2 \; -1 \; 0 \; 1 \; 2$

D.

$-5 \; -4 \; -3 \; -2 \; -1 \; 0 \; 1 \; 2$

Item Information	
Alignment	A1.1.3.1.2
Answer Key	B
Depth of Knowledge	1
p-value A	24%
p-value B	46% (correct answer)
p-value C	17%
p-value D	13%
Option Annotations	A student could determine the **correct** answer, option B, by correctly solving the inequality for $x > {}^-10$ and identifying the graph with an open circle at $^-10$ is shaded to the right of the open circle.

A student could arrive at an **incorrect** answer by reversing the direction of the inequality and/or adding 4 to $^-6$ instead of subtracting the 4 from $^-6$. For example, a student could arrive at option A by reversing the direction of the inequality. |

10. A part for a machine must meet certain length requirements, in centimeters (cm), as shown in the inequality below.

$$|6.75 - x| < 0.25$$

Which statement completely describes the length requirements for this machine part?

    A.   The length of the part must be less than 7 cm.

    B.   The length of the part must be greater than 6.5 cm.

    C.   The length of the part must be less than 6.5 cm or greater than 7 cm.

    D.   The length of the part must be greater than 6.5 cm and less than 7 cm.

Item Information	
Alignment	A1.1.3.1.3
Answer Key	D
Depth of Knowledge	2
p-value A	22%
p-value B	20%
p-value C	18%
p-value D	40% (correct answer)
Option Annotations	A student could determine the **correct** answer, option D, by rewriting the absolute value inequality as the compound inequality $-0.25 < 6.75 - x < 0.25$, simplifying the inequality to $6.5 < x < 7$, and interpreting the inequality to mean x (the length) must be greater than 6.5 and less than 7. A student could arrive at an **incorrect** answer by not considering the absolute value bars, misapplying the absolute value bars, and/or misreading the inequality symbol. For example, a student could arrive at option A by switching the terms within the absolute value bars and then solving $x - 6.75 < 0.25$ as $x < 7$.

11. A graph of a system of inequalities is shown below.
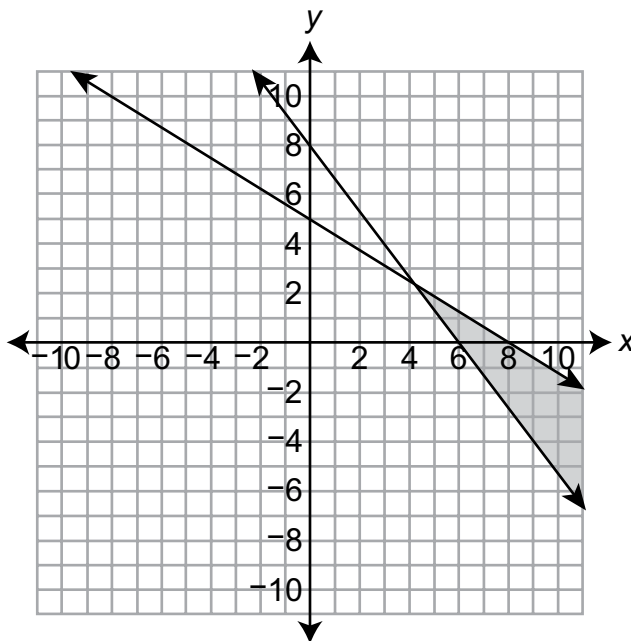
Which system of inequalities describes the graph?

A. $4x + 3y > 24$
    $5x + 8y < 40$

B. $4x + 3y \geq 24$
    $5x + 8y \leq 40$

C. $4x + 3y < 24$
    $5x + 8y > 40$

D. $4x + 3y \leq 24$
    $5x + 8y \geq 40$

Item Information

Alignment	A1.1.3.2.1
Answer Key	B
Depth of Knowledge	1
p-value A	15%
p-value B	47% (correct answer)
p-value C	14%
p-value D	24%
Option Annotations	A student could determine the **correct** answer, option B, by identifying both boundaries as solid lines so the inequalities should both be inclusive and determining that the shaded region is above the line $4x + 3y = 24$ and below the line $5x + 8y = 40$.

A student could arrive at an **incorrect** answer by reversing the inequalities and/or by using strict (non-inclusive) inequalities. For example, a student could arrive at option D by reversing both inequalities. |

12. All the books in a bookstore window display today will be mysteries and biographies. The system of inequalities below describes the relationship between the number of mysteries (x) and the number of biographies (y) that could be in the display.

$$x + y \leq 30$$

$$2x \leq 3y$$

Which description is a possible number of books of each type that could be in the display?

A. 6 mysteries and 22 biographies

B. 15 mysteries and 8 biographies

C. 21 mysteries and 14 biographies

D. 24 mysteries and 12 biographies

Item Information	
Alignment	A1.1.3.2.2
Answer Key	A
Depth of Knowledge	2
p-value A	66% (correct answer)
p-value B	13%
p-value C	13%
p-value D	8%
Option Annotations	A student could determine the **correct** answer, option A, by identifying a pair of numbers that have a sum no greater than 30 such that the number of mysteries is no more than 1.5 times the number of biographies.
	A student could arrive at an **incorrect** answer by satisfying only one of the two inequalities. For example, a student could arrive at option C by identifying a set of values such that the number of mysteries is 1.5 times the number of biographies but does not consider that the total number of books (35) is greater than 30.

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CONSTRUCTED-RESPONSE ITEM

13. Small baskets of tomatoes are sold at a vegetable stand for $3 per basket. Large baskets of tomatoes are sold at the stand for $5 per basket. Only whole numbers of baskets may be purchased.

A customer purchases a total of 8 baskets of tomatoes and pays $36.

A. Write and solve a system of equations that models the number of small baskets (x) and the number of large baskets (y) that the customer purchases. Show or explain all your work.

Go to the next page to finish question 13.

GO ON

13. *Continued.* Please refer to the previous page for task explanation.

Another customer claims that he can purchase a total of 10 baskets of tomatoes and pay $45.

B. Use a system of equations that describes this other customer's purchase to explain why the claim is incorrect.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

Item-Specific Scoring Guideline

#13 Item Information

Alignment	A1.1.2	Depth of Knowledge	2	Mean Score	1.58

Assessment Anchor this item will be reported under:

    A1.1.2—Linear Equations

Specific Assessment Anchor Descriptor addressed by this item:

    A1.1.2.2—Write, solve, and/or graph systems of linear equations using various methods.

Scoring Guide

Score	Description
4	The student demonstrates a thorough understanding of linear equations by correctly solving problems with clear and complete procedures and explanations when required.
3	The student demonstrates a general understanding of linear equations by solving problems and providing procedures and explanations with only minor errors or omissions.
2	The student demonstrates a partial understanding of linear equations by providing a portion of the correct problem solving, procedures, and explanations.
1	The student demonstrates a minimal understanding of linear equations.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

Top-Scoring Student Response and Training Notes

Score	Description
4	Student earns 4 points.
3	Student earns 3.0–3.5 points.
2	Student earns 2.0–2.5 points.
1	Student earns 0.5–1.5 points. OR Student demonstrates minimal understanding of linear equations.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Top-Scoring Response

Part A (3 points):

$\frac{1}{2}$ point for each correct equation

$\frac{1}{2}$ point for each correct value of the solution

   OR $\frac{1}{2}$ point for embedded solution

1 point for complete support

   OR $\frac{1}{2}$ point for correct but incomplete support

What?	Why?
$x + y = 8$ $3x + 5y = 36$ **AND** $x = 2$ (small baskets) $y = 6$ (large baskets)	**Sample Work:** $x + y = 8$ $\rightarrow$ $x = 8 - y$ $3x + 5y = 36$ $3x + 5y = 36$ $3(8 - y) + 5y = 36$ $24 - 3y + 5y = 36$ $2y = 12$ $\rightarrow$ $x + 6 = 8$ $y = 6$ $x = 2$ **OR** **Sample Explanation:** First, I set up my system of equations. $x + y = 8$ $3x + 5y = 36$ I then multiplied the first row by 5 and the second row by ⁻1, so I could add them together and cancel out the y-terms. This gave me $2x = 4$, so $x = 2$. I substituted this value into the first equation and solved it for y to get $y = 6$.

Part B (1 point):

1 point for correct and complete explanation

OR $\frac{1}{2}$ point for correct but incomplete explanation

What?	Why?
	Sample Explanation: The system of equations that describes this other customer's purchase is shown. $x + y = 10$ $3x + 5y = 45$ The solution of this system of equations exists, but neither x nor y is a whole number, so the customer cannot purchase 10 baskets of tomatoes for $45.

STUDENT RESPONSE

Response Score: 4 points

PARTS A AND B

Small baskets of tomatoes are sold at a vegetable stand for $3 per basket. Large baskets of tomatoes are sold at the stand for $5 per basket. Only whole numbers of baskets may be purchased.

A customer purchases a total of 8 baskets of tomatoes and pays $36.

A. Write and solve a system of equations that models the number of small baskets (x) and the number of large baskets (y) that the customer purchases. Show or explain all your work.

$3x + 5y = 36$ $x = 8 - y$ $3(8 - y) + 5y = 36$ $x + y = 8$

$x + y = 8$ $24 - 3y + 5y = 36$ $x + 6 = 8$

                            $24 + 2y = 36$ $x = 2$

                                 $2y = 12$

                                  $y = 6$

The customer bought 2 small baskets of tomatoes and 6 large baskets of tomatoes.

237 / 1000

> The student has provided two correct equations, a correct solution, and complete support.

Another customer claims that he can purchase a total of 10 baskets of tomatoes and pay $45.

B. Use a system of equations that describes this other customer's purchase to explain why the claim is incorrect.

$x + y = 10$ $3(10 - y) + 5y = 45$ $2y = 15$ $x + 7.5 = 10$

$3x + 5y = 45$ $30 - 3y + 5y = 45$ $y = 7.5$ $x = 2.5$

$x = 10 - y$ $30 + 2y = 45$

This other customer's claim is incorrect because in order for it to be true, he would have had to buy 2.5 baskets of tomatoes and 7.5 large baskets of tomatoes. However, this is not possible because only whole numbers of bushels may be purchased.

380 / 1000

> The student has provided a correct and complete explanation.

STUDENT RESPONSE

Response Score: 3 points

13. Small baskets of tomatoes are sold at a vegetable stand for $3 per basket. Large baskets of tomatoes are sold at the stand for $5 per basket. Only whole numbers of baskets may be purchased.

A customer purchases a total of 8 baskets of tomatoes and pays $36.

A. Write and solve a system of equations that models the number of small baskets (*x*) and the number of large baskets (*y*) that the customer purchases. Show or explain all your work.

$$\$3x^{(2)} + \$5y^{(6)} = \$36$$

$$\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array} \qquad \begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array} \qquad \begin{array}{r} 30 \\ + 6 \\ \hline 36 \end{array}$$

2 small baskets
6 large baskets

> The student has provided one correct equation, a correct solution, and correct but incomplete support.

Go to the next page to finish question 13.

GO ON ➤

13. *Continued.* Please refer to the previous page for task explanation.

> Another customer claims that he can purchase a total of 10 baskets of tomatoes and pay $45.
>
> **B.** Use a system of equations that describes this other customer's purchase to explain why the claim is incorrect.
>
> 5,5
> 6,4
> 7,3
> 8,2
> 1,9
>
> $$\$3x + \$5y = \$45$$
>
> This customer's claim is incorrect because if you plug in any pair of numbers adding up to (10) and plugging them into (x) and (y), you couldn't get 45. To get $ this number, you would have to plug in decimals, but you could only use whole numbers.

> The student has provided a correct and complete explanation.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

STUDENT RESPONSE

Response Score: 2 points

PARTS A AND B

Question 13
Page 1

Small baskets of tomatoes are sold at a vegetable stand for $3 per basket. Large baskets of tomatoes are sold at the stand for $5 per basket. Only whole numbers of baskets may be purchased.

A customer purchases a total of 8 baskets of tomatoes and pays $36.

A. Write and solve a system of equations that models the number of small baskets (x) and the number of large baskets (y) that the customer purchases. Show or explain all your work.

EQ

$5 \times 6 + 3 \times 2 = 36$
$6 + 2 = 8$

$(2,6)$

23 / 1000

> The student has provided no correct equations, a correct solution, and correct but incomplete support.

Another customer claims that he can purchase a total of 10 baskets of tomatoes and pay $45.

B. Use a system of equations that describes this other customer's purchase to explain why the claim is incorrect.

EQ

$x + y = 10$
$3x + 5y = 45$

15 / 1000

> The student has provided a correct but incomplete explanation. (The system of equations is found, but there is no explanation why the claim will not work for this system.)

Review/End Test   Pause   Flag   Options

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STUDENT RESPONSE

Response Score: 1 point

13. Small baskets of tomatoes are sold at a vegetable stand for $3 per basket. Large baskets of tomatoes are sold at the stand for $5 per basket. Only whole numbers of baskets may be purchased.

A customer purchases a total of 8 baskets of tomatoes and pays $36.

A. Write and solve a system of equations that models the number of small baskets (x) and the number of large baskets (y) that the customer purchases. Show or explain all your work.

$$3x + 5y = 36$$

$$\frac{3x}{3} = \frac{36}{3}$$

$$x = 12$$

$$\frac{5y}{5} = \frac{36}{5}$$

$$y = 7.1$$

> The student has provided one correct equation, an incorrect solution, and incorrect support.

Go to the next page to finish question 13.

GO ON ▶

13. *Continued.* Please refer to the previous page for task explanation.

Another customer claims that he can purchase a total of 10 baskets of tomatoes and pay $45.

B. Use a system of equations that describes this other customer's purchase to explain why the claim is incorrect.

$$3x = 5y = 45$$

$$\frac{3x}{3} = \frac{45}{3}$$

$$x = 15$$

$$\frac{5y}{5} = \frac{45}{5}$$

$$5y = 9$$

$$3 \times 15 + 5 \times 9 = 105$$

> The student has provided an incorrect explanation.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

STUDENT RESPONSE

Response Score: 0 points

PARTS A AND B

Small baskets of tomatoes are sold at a vegetable stand for $3 per basket. Large baskets of tomatoes are sold at the stand for $5 per basket. Only whole numbers of baskets may be purchased.

A customer purchases a total of 8 baskets of tomatoes and pays $36.

A. Write and solve a system of equations that models the number of small baskets (x) and the number of large baskets (y) that the customer purchases. Show or explain all your work.

$(x)(y) = 36$

$(3)(5) = 36$

He/She would have to purchase 12 small baskets and 0 large baskets.

> The student has provided no correct equations, an incorrect solution, and no support.

Another customer claims that he can purchase a total of 10 baskets of tomatoes and pay $45.

B. Use a system of equations that describes this other customer's purchase to explain why the claim is incorrect.

if you take 45/10 you would get 4.5 so his answer was hypotheoritical or not logical because its impossible

> The student has provided an incorrect explanation.

93 / 1000

107 / 1000

Review/End Test   Pause   Flag   Options   Next

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CONSTRUCTED-RESPONSE ITEM

14. Kyle has $4 more than twice as much money as Lana. Lana has x dollars. Kyle does not have enough money to buy a video game that costs $56, but he has enough money to buy a textbook that costs $38.

A. Write a compound inequality that represents all the possible amounts of money Kyle could have in terms of x.

compound inequality: _____

B. What is the **least** amount of money Lana could have?

$ _____

Go to the next page to finish question 14.

GO ON

14. *Continued.* Please refer to the previous page for task explanation.

Lana has a whole number of dollars.

C. List the different possible amounts of money, in dollars, Lana could have.

different possible amounts: _____

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

Item-Specific Scoring Guideline

#14 Item Information

Alignment	A1.1.3	Depth of Knowledge	2	Mean Score	1.00

Assessment Anchor this item will be reported under:

A1.1.3—Linear Inequalities

Specific Assessment Anchor Descriptor addressed by this item:

A1.1.3.1—Write, solve, and/or graph linear inequalities using various methods.

Scoring Guide

Score	Description
4	Demonstrates a thorough understanding of writing and/or solving a system of linear inequalities and interpreting solutions to problems in the context of the problem situation by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of writing and/or solving a system of linear inequalities and interpreting solutions to problems in the context of the problem situation by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of writing and/or solving a system of linear inequalities and interpreting solutions to problems in the context of the problem situation by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of writing and/or solving a system of linear inequalities and interpreting solutions to problems in the context of the problem situation.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

Top-Scoring Student Response and Training Notes

Score	Description
4	Student earns 4 points.
3	Student earns 3 points.
2	Student earns 2 points.
1	Student earns 1 point.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Top-Scoring Response

Part A (2 points):

> 2 points for correct answer
> > **OR**
> 1 point for correct half of compound inequality
> > **OR**
> 1 point for correct inequalities joined by "or"

What?	Why?
$38 \leq 2x + 4 < 56$ **OR** $2x + 4 \geq 38$ and $2x + 4 < 56$ **OR** $17 \leq x < 26$ **OR** $x \geq 17$ and $x < 26$ **OR equivalent**	

Part B (1 point):

> 1 point for correct answer

What?	Why?
(\$)17 [note: carry over any error from part A]	

Part C (1 point):

1 point for correct answer

What?	Why?
($)17, ($)18, ($)19, ($)20, ($)21, ($)22, ($)23, ($)24, ($)25 [note: carry over any error from part A]	

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STUDENT RESPONSE

Response Score: 4 points

14. Kyle has $4 more than twice as much money as Lana. Lana has *x* dollars. Kyle does not have enough money to buy a video game that costs $56, but he has enough money to buy a textbook that costs $38.

A. Write a compound inequality that represents all the possible amounts of money Kyle could have in terms of *x*.

compound inequality: ___$19 \leq x + 2 < 28$___

> The response provides a correct answer (equivalent compound inequality).

B. What is the **least** amount of money Lana could have?

$ ___17___

> The response provides a correct answer.

Go to the next page to finish question 14.

GO ON ➤

14. *Continued.* Please refer to the previous page for task explanation.

Lana has a whole number of dollars.

C. List the different possible amounts of money, in dollars, Lana could have.

The response provides a correct answer.

different possible amounts: $17, $18, $19, $20, $21, $22, $23, $24, $25

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

STUDENT RESPONSE

Response Score: 3 points

PARTS A, B, AND C

Question 14

Kyle has $4 more than twice as much money as Lana. Lana has x dollars. Kyle does not have enough money to buy a video game that costs $56, but he has enough money to buy a textbook that costs $38.

A. Write a compound inequality that represents all the possible amounts of money Kyle could have in terms of x.

compound inequality: EQ $38 < 2x + 4 < 56$

10 / 50

> The response provides one correct half of the correct compound equality $(2x + 4 < 56)$.

B. What is the **least** amount of money Lana could have?

EQ $ 17

2 / 50

> The response provides a correct answer.

Lana has a whole number of dollars.

C. List the different possible amounts of money, in dollars, Lana could have.

different possible amounts: EQ   17, 18, 19, 20, 21, 22, 23, 24, 25

34 / 50

> The response provides a correct answer.

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STUDENT RESPONSE

Response Score: 2 points

14. Kyle has $4 more than twice as much money as Lana. Lana has *x* dollars. Kyle does not have enough money to buy a video game that costs $56, but he has enough money to buy a textbook that costs $38.

A. Write a compound inequality that represents all the possible amounts of money Kyle could have in terms of *x*.

compound inequality: $money = 4 + (2 \times x)$

> The response provides an incorrect answer.

B. What is the **least** amount of money Lana could have?

$ 17

> The response provides a correct answer.

Go to the next page to finish question 14.

GO ON

14. *Continued.* Please refer to the previous page for task explanation.

Lana has a whole number of dollars.

C. List the different possible amounts of money, in dollars, Lana could have.

The response provides a correct answer.

different possible amounts: $17, $18, $19, $20, $21, $22, $23, $24, $25

**AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER
BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW
YOU ARE FINISHED.**

STOP

STUDENT RESPONSE

Response Score: 1 point

PARTS A, B, AND C

Question 14

Kyle has $4 more than twice as much money as Lana. Lana has x dollars. Kyle does not have enough money to buy a video game that costs $56, but he has enough money to buy a textbook that costs $38.

A. Write a compound inequality that represents all the possible amounts of money Kyle could have in terms of x.

compound inequality: $38 < 2x + 4 > 56$

> The response provides an incorrect answer. Both inequality signs are incorrect.

B. What is the **least** amount of money Lana could have?

$ 17

> The response provides a correct answer.

Lana has a whole number of dollars.

C. List the different possible amounts of money, in dollars, Lana could have.

different possible amounts: $17 \le x \ge \$26$

> The response provides an incorrect answer.

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STUDENT RESPONSE

Response Score: 0 points

14. Kyle has $4 more than twice as much money as Lana. Lana has x dollars. Kyle does not have enough money to buy a video game that costs $56, but he has enough money to buy a textbook that costs $38.

A. Write a compound inequality that represents all the possible amounts of money Kyle could have in terms of x.

The response provides an incorrect answer.

compound inequality: $2x + 4 = m$

B. What is the **least** amount of money Lana could have?

$ 15

The response provides an incorrect answer.

Go to the next page to finish question 14.

GO ON ➤

14. *Continued.* Please refer to the previous page for task explanation.

Lana has a whole number of dollars.

C. List the different possible amounts of money, in dollars, Lana could have.

The response provides an incorrect answer.

different possible amounts: _15   20   22_____

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

ALGEBRA I MODULE 1—SUMMARY DATA

MULTIPLE-CHOICE

Sample Number	Alignment	Answer Key	Depth of Knowledge	*p*-values A	*p*-values B	*p*-values C	*p*-values D
1	A1.1.1.1.1	C	1	14%	17%	**60%**	9%
2	A1.1.1.3.1	B	1	11%	**62%**	13%	14%
3	A1.1.1.5.1	A	2	**41%**	31%	17%	11%
4	A1.1.1.5.3	C	1	11%	22%	**51%**	16%
5	A1.1.2.1.1	D	2	7%	39%	4%	**50%**
6	A1.1.2.1.3	C	2	14%	4%	**80%**	2%
7	A1.1.2.2.1	D	2	5%	10%	12%	**73%**
8	A1.1.2.2.2	A	2	**77%**	5%	12%	6%
9	A1.1.3.1.2	B	1	24%	**46%**	17%	13%
10	A1.1.3.1.3	D	2	22%	20%	18%	**40%**
11	A1.1.3.2.1	B	2	15%	**47%**	14%	24%
12	A1.1.3.2.2	A	2	**66%**	13%	13%	8%

CONSTRUCTED-RESPONSE

Sample Number	Alignment	Points	Depth of Knowledge	Mean Score
13	A1.1.2	4	2	1.58
14	A1.1.3	4	2	1.00

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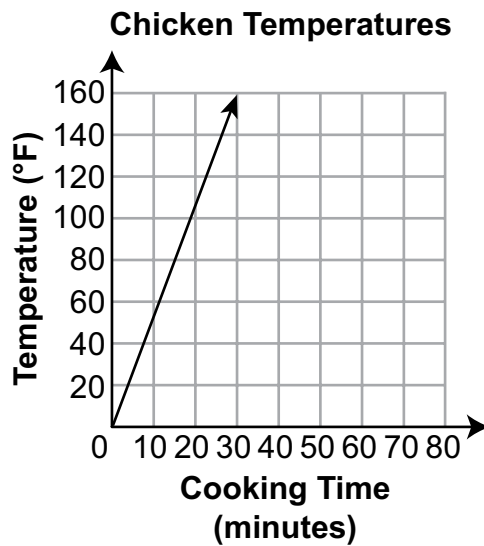
ALGEBRA I MODULE 2
Multiple-Choice Items

1. Chef Bailey measured the internal temperature of a whole chicken during the first 60 minutes of cooking time. The pattern in the temperatures she measured is shown in the table below.
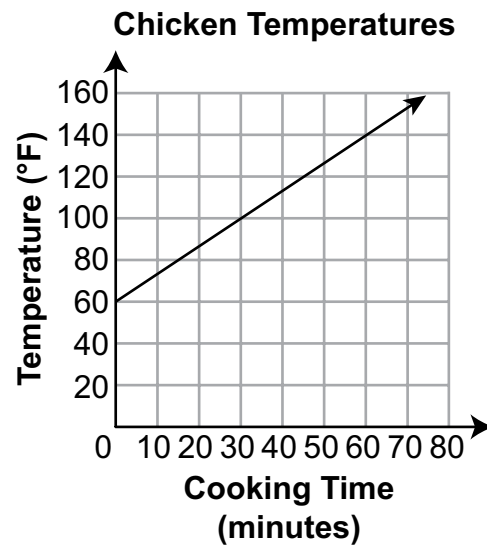
Chicken Temperatures

Cooking Time (minutes)	15	30	45	60
Temperature (°F)	80	100	120	140

The pattern continues. Which graph **best** represents the pattern?

A.

B.

C.

D.

Item Information	
Alignment	A1.2.1.1.1
Answer Key	B
Depth of Knowledge	1
p-value A	7%
p-value B	72% (correct answer)
p-value C	7%
p-value D	14%
Option Annotations	A student could determine the **correct** answer, option B, by using the pattern in the table to determine the rate of change $\left(\frac{4}{3}\right)$ and the initial temperature (60°F). A student could arrive at an **incorrect** answer by incorrectly identifying which value to use as the initial temperature. For example, a student could arrive at option D by using the first temperature from the table as the initial temperature.

2. Which set of ordered pairs is a function?

    A.   {(-10, 4), (-8, 3), (-8, 2), (-4, 1)}

    B.   {(-2, 4), (0, 4), (2, 4), (2, 6)}

    C.   {(1, 5), (1, 6), (2, 7), (3, 8)}

    D.   {(-1, 1), (0, 0), (1, 1), (2, 2)}

Item Information	
Alignment	A1.2.1.1.2
Answer Key	D
Depth of Knowledge	1
p-value A	10%
p-value B	9%
p-value C	17%
p-value D	64% (correct answer)
Option Annotations	A student could determine the **correct** answer, option D, by selecting the answer that shows each *x*-value with only one *y*-value. A student could arrive at an **incorrect** answer by failing to notice that there are different *y*-values for the same *x*-value. For example, a student could arrive at option C by not noticing that the first and second points have different *y*-values for the same *x*-value.

3. Laura drove her car on three trips. She began each trip with a full tank of fuel in her car. The table below shows the relation between the distance driven on each trip and the amount of fuel remaining in the car's fuel tank at the end of the trip.

Laura's Trips

Distance Driven (miles)	Amount of Fuel Remaining (gallons)
60	15
160	10
200	8

What is the range of the relation in the table?

A. {8, 10, 15}

B. {60, 160, 200}

C. {all whole numbers from 8 through 15}

D. {all whole numbers from 60 through 200}

Item Information	
Alignment	A1.2.1.1.3
Answer Key	A
Depth of Knowledge	1
p-value A	51% (correct answer)
p-value B	20%
p-value C	17%
p-value D	12%
Option Annotations	A student could determine the **correct** answer, option A, by selecting the dependent values (amount of fuel remaining) shown in the table. A student could arrive at an **incorrect** answer by identifying the domain instead of the range or by including all whole number values between the given numbers. For example, a student could arrive at option B by identifying the domain instead of the range.

4. Paul inherited a stamp collection. Since receiving the collection, Paul has gone to the store and bought the same number of new stamps each week to add to his collection. The equation shown below can be used to determine the number of stamps (y) in Paul's stamp collection x weeks after he inherited the stamps.

$$y = 3x + 40$$

Based on the equation, which statement is true?

A. The stamp collection had 3 stamps in it when Paul inherited it.

B. So far, Paul has purchased 40 additional stamps for the collection.

C. Since inheriting the collection, Paul has bought 3 new stamps each week.

D. Six weeks after he inherited the collection, Paul's stamp collection contains 18 stamps.

Item Information	
Alignment	A1.2.1.2.1
Answer Key	C
Depth of Knowledge	2
p-value A	5%
p-value B	17%
p-value C	74% (correct answer)
p-value D	4%
Option Annotations	A student could determine the **correct** answer, option C, by interpreting the slope (3) as the number of new stamps Paul bought each week. A student could arrive at an **incorrect** answer by misinterpreting what the values in the equation represent. For example, a student could arrive at option B by considering that the *y*-intercept represents additional records.

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5. A function of *x* is graphed on the coordinate plane below.
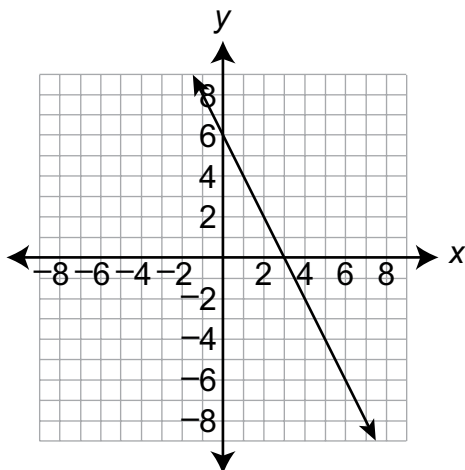
Which table represents the function?

A.

x	y
−8	19
−6	15
−4	11
−2	7

B.

x	y
−8	50
−6	38
−4	26
−2	14

C.

x	y
−8	22
−6	18
−4	14
−2	10

D.

x	y
−8	30
−6	24
−4	18
−2	12

Item Information	
Alignment	A1.2.1.2.2
Answer Key	C
Depth of Knowledge	2
p-value A	25%
p-value B	12%
p-value C	49% (correct answer)
p-value D	14%
Option Annotations	A student could determine the **correct** answer, option C, response by determining which table has the same rate of change (-3) and *y*-intercept (6) as the given function. A student could arrive at an **incorrect** answer by incorrectly using the intercepts. For example, a student could arrive at option A by using the *x*-intercept as the *y*-intercept ($y = {}^-2x + 3$).

6. A caterer uses 4 pans of lasagna to serve 30 people. At this rate, how many pans of lasagna does the caterer use to serve 390 people?

    A. 13

    B. 52

    C. 90

    D. 98

Item Information	
Alignment	A1.2.2.1.1
Answer Key	B
Depth of Knowledge	2
p-value A	16%
p-value B	69% (correct answer)
p-value C	4%
p-value D	11%
Option Annotations	A student could determine the **correct** answer, option B, by dividing 4 by 30 to determine the rate per person and then multiplying the rate by 390. A student could arrive at an **incorrect** answer by incorrectly determining and/or applying the rate. For example, a student could arrive at option A by dividing 390 by 30.

7. Which linear equation has the points $\left(\frac{1}{2}, \frac{3}{4}\right)$ and $(4, 3)$ as solutions?

    A. $9x - 14y = {}^-6$

    B. $9x + 14y = 78$

    C. $y - 3 = \frac{14}{9}(x - 4)$

    D. $y - 4 = \frac{9}{14}(x - 3)$

Item Information	
Alignment	A1.2.2.1.3
Answer Key	A
Depth of Knowledge	1
p-value A	49% (correct answer)
p-value B	17%
p-value C	21%
p-value D	13%
Option Annotations	A student could determine the **correct** answer, option A, by determining the slope using the slope formula $\left(m = \dfrac{\left(3 - \frac{3}{4}\right)}{\left(4 - \frac{1}{2}\right)} = \dfrac{\left(\frac{9}{4}\right)}{\left(\frac{7}{2}\right)} = \dfrac{9}{14}\right)$, substituting the slope and one of the points into the point-slope formula, and then identifying an equivalent equation. A student could arrive at an **incorrect** answer by testing only one of the points, inverting the slope, or switching the *x*-values and *y*-values. For example, a student could arrive at option C by substituting the inverse of the slope $\left(\frac{14}{9}\right)$ and the point $(4, 3)$ into the point-slope formula.

8. Martha earns money sewing curtains. She charges a flat fee to meet with a customer and take window measurements and an hourly rate to sew the curtains. The graph below shows the relationship between the time, in hours, Martha works on a sewing project and the total amount, in dollars, she charges.

Martha's Sewing Charges
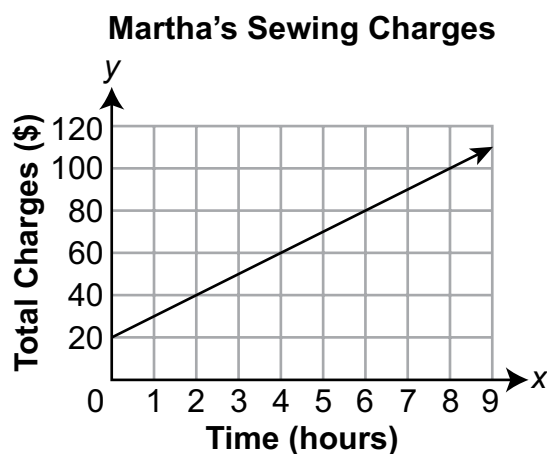
What is the hourly rate that Martha charges for sewing curtains?

A. $10.00

B. $12.50

C. $15.00

D. $20.00

| Item Information	
Alignment	A1.2.2.1.4
Answer Key	A
Depth of Knowledge	2
p-value A	63% (correct answer)
p-value B	6%
p-value C	8%
p-value D	23%
Option Annotations	A student could determine the **correct** answer, option A, by using two points on the graph to determine the slope (e.g., $m = \frac{(100 - 20)}{(8 - 0)} = \frac{80}{8} = 10$). A student could arrive at an **incorrect** answer by using a point on the graph to determine a proportional rate. For example, a student could arrive at option D by confusing the hourly rate with the flat fee or by using the point (2, 40) and dividing 40 by 2 to determine the hourly rate.

9. A data set contains student test scores.

   - The **median** test score is 75 points.
   - The third quartile value is 85 points.
   - The range of the test scores is 40 points.

   Which statement about the test scores in the data set is **most likely** true?

   A. The lowest test score is 45 points.

   B. The highest test score is 95 points.

   C. About 25% of the test scores are less than 55 points.

   D. About 25% of the test scores are between 75 and 85 points.

Item Information	
Alignment	A1.2.3.1.1
Answer Key	D
Depth of Knowledge	2
p-value A	11%
p-value B	13%
p-value C	15%
p-value D	61% (correct answer)
Option Annotations	A student could determine the **correct** answer, option D, by recognizing that about 25% of the data will be between the median and third quartile values. A student could arrive at an **incorrect** answer by confusing the quartile values, confusing the range and the interquartile range, and/or assuming symmetry in the data set. For example, a student could arrive at option C by confusing the range and the interquartile range, assuming symmetry in the data set, and subtracting 20 from 75.

10. The scatter plot below shows nine points from a data set.
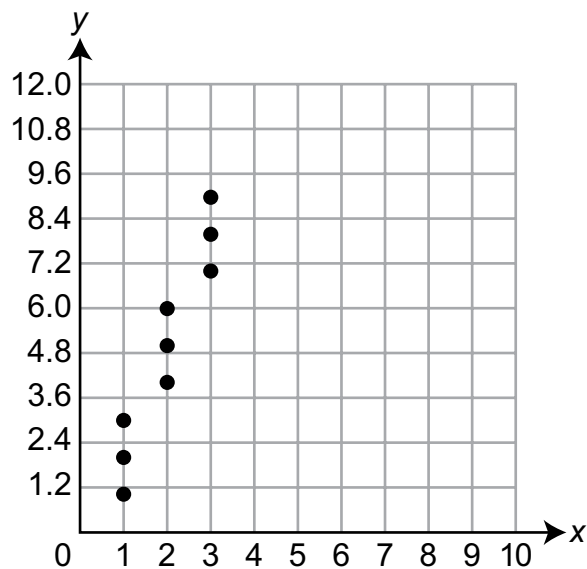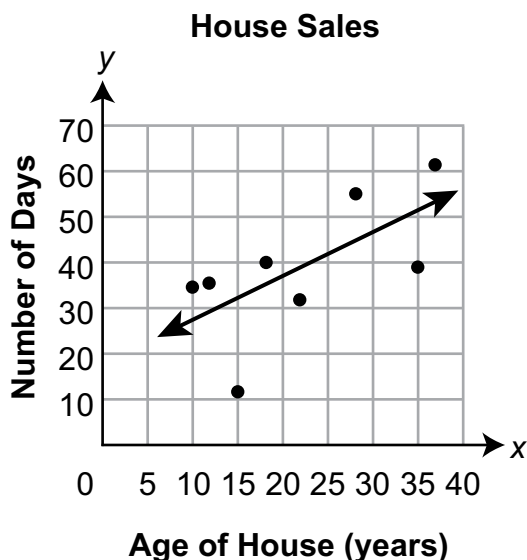

The equation of the line of best fit for the nine points is determined. Then, three more points are added to the scatter plot, but the equation of the original line of best fit remains unchanged. Which three ordered pairs are **most likely** the added data points?

A.   (4, 4), (5, 5), (6, 6)

B.   (4, 10), (4, 11), (4, 12)

C.   (8, 9), (8, 10), (8, 11)

D.   (10, 10), (10, 11), (10, 12)

Item Information	
Alignment	A1.2.3.2.2
Answer Key	B
Depth of Knowledge	2
p-value A	12%
p-value B	73% (correct answer)
p-value C	9%
p-value D	6%
Option Annotations	A student could determine the **correct** answer, option B, by either identifying a **correct** line of best fit (e.g., $y = 3x - 1$) and identifying a set of points that fits that line or recognizing a pattern formed by the given set of points and extending that pattern. A student could arrive at an **incorrect** answer by misinterpreting the pattern created by the data in the scatter plot. For example, a student could arrive at option A by noticing the *y*-values all increase by 1 but not considering the *x*-values repeat for each set of three data points.

11. The scatter plot below shows the relationship between the age of a house and the number of days it takes for the house to be sold after being listed for sale.

House Sales

Age of House (years)

The equation $y = 0.95x + 17.56$ describes the line of best fit for the scatter plot. Based on the equation, which value is **most likely** the number of days it takes for a 60-year-old house to be sold after being listed for sale?

A.   45

B.   70

C.   75

D.   83

Item Information	
Alignment	A1.2.3.2.3
Answer Key	C
Depth of Knowledge	2
p-value A	11%
p-value B	17%
p-value C	59% (correct answer)
p-value D	13%
Option Annotations	A student could determine the **correct** answer, option C, by correctly substituting 60 in for *x*, solving for *y*, and then identifying the value closest to $y = 74.56$. A student could arrive at an **incorrect** answer by incorrectly using the graph or the equation of the given line of best fit. For example, a student could arrive at option B by using the greatest value shown on the *y*-axis.

12. There are 28 students whose last names begin with the letters G, H, J, or K. Information about the probability of randomly selecting one of these students is listed below.

- probability of selecting a student whose last name begins with G: $\frac{1}{7}$

- probability of selecting a student whose last name begins with G or H: $\frac{5}{14}$

How many of these students have a last name that begins with H?

A. 4

B. 5

C. 6

D. 7

Item Information	
Alignment	A1.2.3.3.1
Answer Key	C
Depth of Knowledge	2
p-value A	30%
p-value B	16%
p-value C	38% (correct answer)
p-value D	16%
Option Annotations	A student could determine the **correct** answer, option C, by subtracting $\frac{1}{7}$ from $\frac{5}{14}$ and then multiplying that value by 28. A student could arrive at an **incorrect** answer by incorrectly applying the probabilities. For example, a student could arrive at option A by determining the difference in the numerators: 5 − 1.

CONSTRUCTED-RESPONSE ITEM

13. Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

A. Complete the table below to show the total number of photos and the total number of videos that are on the website based on the number of days since Javier started the website.

Photos and Videos on Javier's Website

Days since Starting Website	Photos on Website	Videos on Website
0	12	0
1	16	1
2		
3		

B. Write the rate of change in the total number of photos on the website each day since Javier started the website.

rate of change: _____

C. Write a linear equation to show the relationship between the total number of videos (*v*) on the website and the number of days (*x*) since Javier started the website.

equation: _____

Go to the next page to finish question 13.

GO ON ➤

13. *Continued.* Please refer to the previous page for task explanation.

> **D.** Draw a line on the coordinate grid to show the relationship between the **combined** number of photos and videos (*y*) on the website and the number of days (*x*) since Javier started the website.
>
> **Photos and Videos on Javier's Website**
>
> *y*
>
> Number of Photos and Videos
>
> 40
> 36
> 32
> 28
> 24
> 20
> 16
> 12
> 8
> 4
>
> 0   1   2   3   4   5   6   7   8   *x*
>
> **Days since Starting Website**

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP
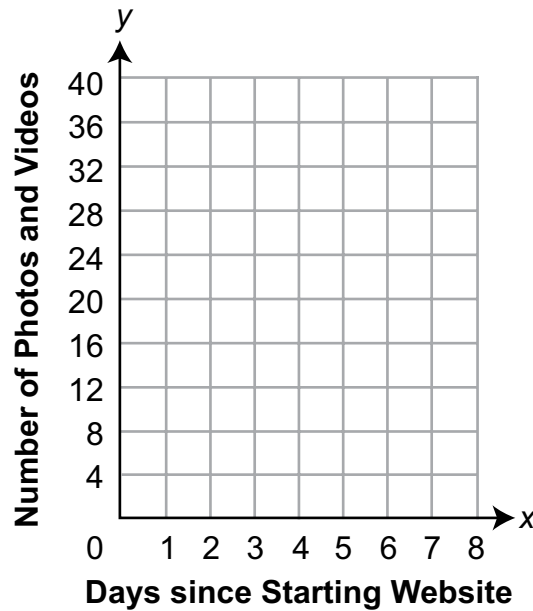
Item-Specific Scoring Guideline

#13 Item Information

Alignment	A1.2.1	Depth of Knowledge	2	Mean Score	2.23

Assessment Anchor this item will be reported under:

A1.2.1—Functions

Specific Assessment Anchor Descriptor addressed by this item:

A1.2.1.2—Interpret and/or use linear functions and their equations, graphs, or tables.

Scoring Guide

Score	Description
4	The student demonstrates a thorough understanding of functions by correctly solving problems with clear and complete procedures and explanations when required.
3	The student demonstrates a general understanding of functions by solving problems and providing procedures and explanations with only minor errors or omissions.
2	The student demonstrates a partial understanding of functions by providing a portion of the correct problem solving, procedures, and explanations.
1	The student demonstrates a minimal understanding of functions.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

Top-Scoring Student Response and Training Notes

Score	Description
4	Student earns 4 points.
3	Student earns 3.0–3.5 points.
2	Student earns 2.0–2.5 points.
1	Student earns 0.5–1.5 points. OR Student demonstrates minimal understanding of functions.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Top-Scoring Response

Part A (1 point):

> 1 point for correct answer

What?	Why?
Photos and Videos on Javier's Website 	

Days Since Starting Website	Photos on Website	Videos on Website
0	12	0
1	16	1
2	20	2
3	24	3

Part B (1 point):

> 1 point for correct answer

What?	Why?
4	
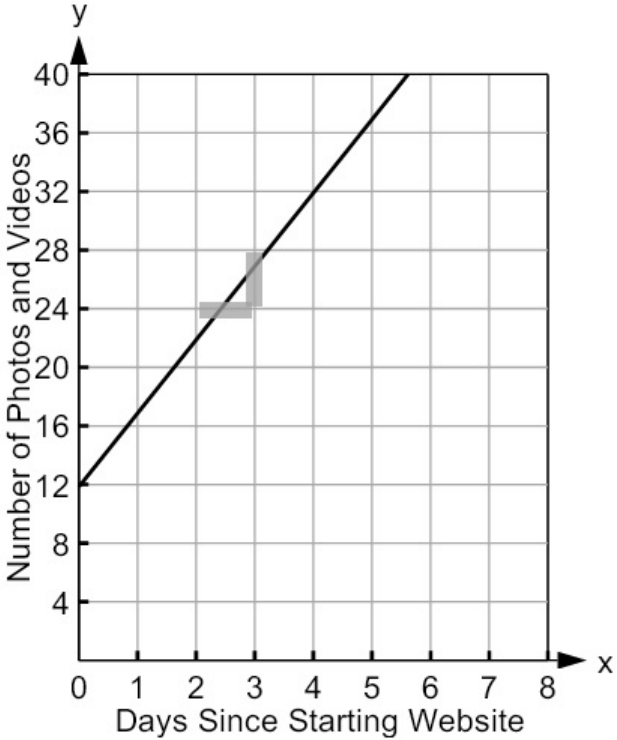
Part C (1 point):

> 1 point for correct answer

What?	Why?
$v = x$	

Part D (1 point):

1 point for correct answer

What?	Why?
Answers may vary. The solid line below represents the equation $y = 5x + 12$. Students must draw a reasonably straight line that passes through (0, 12), $2 < x < 3$ for $y = 24$, and $24 < y < 28$ for $x = 3$ (see shading below). Note: line <u>cannot</u> pass through (2, 24), (3, 24), or (3, 28). Photos and Videos on Javier's Website 	

STUDENT RESPONSE

Response Score: 4 points

PART A

Question 13
Page 1 of 3

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

A. Complete the table below to show the total number of photos and the total number of videos that are on the website based on the number of days since Javier started the website.

Photos and Videos on Javier's Website

Days since Starting Website	Photos on Website	Videos on Website
0	12	0
1	16	1
2	20	2
3	24	3

The response provides a correct answer.

STUDENT RESPONSE

PARTS B AND C

Question 13
Page 2 of 3

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

B. Write the rate of change in the total number of photos on the website each day since Javier started the website.

rate of change: 4 photos added per day

22 / 50

The response provides a correct answer.

C. Write a linear equation to show the relationship between the total number of videos (*v*) on the website and the number of days (*x*) since Javier started the website.

equation: v=x+0

5 / 50

The response provides a correct answer.

STUDENT RESPONSE

PART D

Question 13
Page 3 of 3

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

D. Draw a line on the coordinate grid to show the relationship between the **combined** number of photos and videos (y) on the website and the number of days (x) since Javier started the website.

Photos and Videos on Javier's Website

The response provides a correctly plotted line.

STUDENT RESPONSE

Response Score: 3 points

13. Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

A. Complete the table below to show the total number of photos and the total number of videos that are on the website based on the number of days since Javier started the website.

Photos and Videos on Javier's Website

Days since Starting Website	Photos on Website	Videos on Website	
0	12	0	12
1	16	1	17
2	20	2	22
3	24	3	27

> The response provides a correct answer.

B. Write the rate of change in the total number of photos on the website each day since Javier started the website.

rate of change: ___4___

> The response provides a correct answer.

C. Write a linear equation to show the relationship between the total number of videos (*v*) on the website and the number of days (*x*) since Javier started the website.

equation: ___V·4 + x + 1___
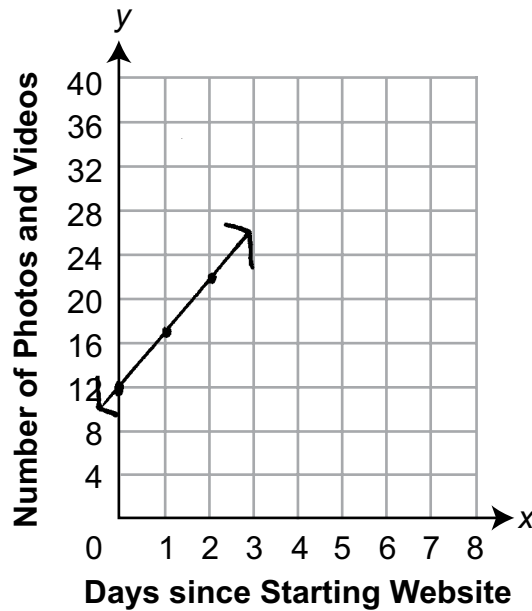
> The response provides an incorrect answer.

Go to the next page to finish question 13.   **GO ON** ▶

13. *Continued.* Please refer to the previous page for task explanation.

D. Draw a line on the coordinate grid to show the relationship between the **combined** number of photos and videos (*y*) on the website and the number of days (*x*) since Javier started the website.

Photos and Videos on Javier's Website

The response provides a correctly plotted line.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

STUDENT RESPONSE

Response Score: 2 points

PART A

Question 13
Page 1 of 3

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

A. Complete the table below to show the total number of photos and the total number of videos that are on the website based on the number of days since Javier started the website.

Photos and Videos on Javier's Website

Days since Starting Website	Photos on Website	Videos on Website
0	12	0
1	16	1
2	20	2
3	24	3

The response provides a correct answer.

ALGEBRA I   ❷   MODULE 2

STUDENT RESPONSE

PARTS B AND C

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

B. Write the rate of change in the total number of photos on the website each day since Javier started the website.

rate of change: [EQ] 4x

2 / 50

The response provides an incorrect answer.

C. Write a linear equation to show the relationship between the total number of videos (*v*) on the website and the number of days (*x*) since Javier started the website.

equation: [EQ] v=x

3 / 50

The response provides a correct answer.

STUDENT RESPONSE

PART D

Question 13
Page 3 of 3

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

D. Draw a line on the coordinate grid to show the relationship between the **combined** number of photos and videos (*y*) on the website and the number of days (*x*) since Javier started the website.

Photos and Videos on Javier's Website

The response provides an incorrectly plotted line.

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STUDENT RESPONSE

Response Score: 1 point

13. Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

A. Complete the table below to show the total number of photos and the total number of videos that are on the website based on the number of days since Javier started the website.

Photos and Videos on Javier's Website

Days since Starting Website	Photos on Website	Videos on Website
0	12	0
1	16	1
2	20	2
3	24	3

> The response provides a correct answer.

B. Write the rate of change in the total number of photos on the website each day since Javier started the website.

rate of change: _____ 27 _____

> The response provides an incorrect answer.

C. Write a linear equation to show the relationship between the total number of videos (*v*) on the website and the number of days (*x*) since Javier started the website.

equation: _____ v · x = y _____

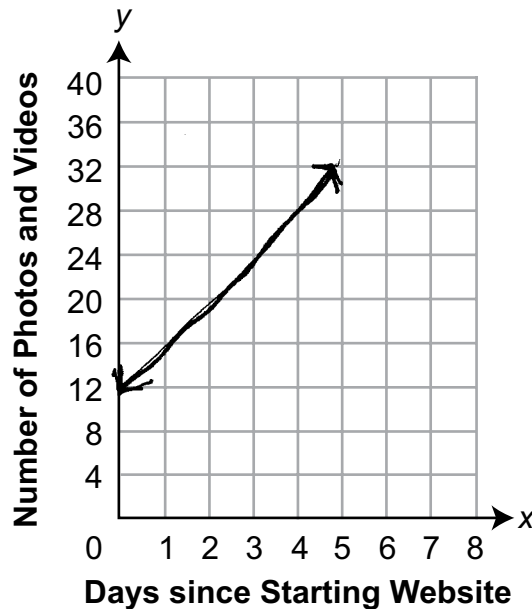> The response provides an incorrect answer.

Go to the next page to finish question 13.

GO ON ➤

13. *Continued.* Please refer to the previous page for task explanation.

D. Draw a line on the coordinate grid to show the relationship between the **combined** number of photos and videos (*y*) on the website and the number of days (*x*) since Javier started the website.

Photos and Videos on Javier's Website

The response provides an incorrectly plotted line.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

STUDENT RESPONSE

Response Score: 0 points

PART A

Question 13
Page 1 of 3

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

A. Complete the table below to show the total number of photos and the total number of videos that are on the website based on the number of days since Javier started the website.

Photos and Videos on Javier's Website

Days since Starting Website	Photos on Website	Videos on Website
0	12	0
1	16	1
2	20	.1
3	24	.125

The response provides an incorrect answer.

STUDENT RESPONSE

PARTS B AND C

Question 13
Page 2 of 3

Javier has a website on which he posts photos and videos. The day he started the website, he posted 12 photos and no videos. For each day after he started the website, he posts 4 new photos and 1 new video.

B. Write the rate of change in the total number of photos on the website each day since Javier started the website.

rate of change: | 0, 1, .1, .125 = 1.225 |

22 / 50

The response provides an incorrect answer.

C. Write a linear equation to show the relationship between the total number of videos (*v*) on the website and the number of days (*x*) since Javier started the website.

equation: | 1x+4=.1y |

8 / 50

The response provides an incorrect answer.
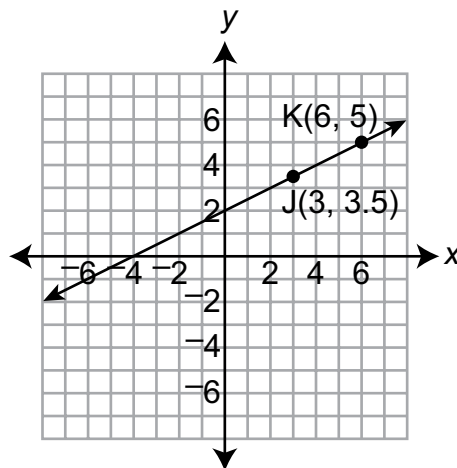
STUDENT RESPONSE

PART D

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CONSTRUCTED-RESPONSE ITEM

14. Points J and K lie on the same line, as shown on the coordinate plane below.

A. What is the slope of the line passing through points J and K? Show or explain all your work.

Go to the next page to finish question 14.

GO ON

14. *Continued.* Please refer to the previous page for task explanation.

> **B.** Write the equation of the line passing through points J and K. Show or explain all your work.

Points L and M are added to the coordinate plane. The slope of $\overleftrightarrow{JK}$ is equal to the slope of $\overleftrightarrow{LM}$.

C. Describe two ways the lines could be related.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

Item-Specific Scoring Guideline

#14 Item Information

Alignment	A1.2.2	Depth of Knowledge	2	Mean Score	1.66

Assessment Anchor this item will be reported under:

A1.2.2—Coordinate Geometry

Specific Assessment Anchor Descriptor addressed by this item:

A1.2.2.1—Describe, compute, and/or use the rate of change (slope) of a line.

Scoring Guide

Score	Description
4	The student demonstrates a thorough understanding of coordinate geometry by correctly solving problems with clear and complete procedures and explanations when required.
3	The student demonstrates a general understanding of coordinate geometry by solving problems and providing procedures and explanations with only minor errors or omissions.
2	The student demonstrates a partial understanding of coordinate geometry by providing a portion of the correct problem solving, procedures, and explanations.
1	The student demonstrates a minimal understanding of coordinate geometry.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

Top-Scoring Student Response and Training Notes

Score	Description
4	Student earns 4 points.
3	Student earns 3.0–3.5 points.
2	Student earns 2.0–2.5 points.
1	Student earns 0.5–1.5 points. OR Student demonstrates minimal understanding of coordinate geometry.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Top-Scoring Response

Part A (1 point):

$\frac{1}{2}$ point for correct answer

$\frac{1}{2}$ point for complete support

What?	Why?
$\frac{1}{2}$ **OR** 0.5	**Sample Work:** $\dfrac{5-3.5}{6-3} = \dfrac{1.5}{3} = \dfrac{1}{2}$ **OR** **Sample Explanation:** To determine the slope, I found the difference in the *y*-coordinates and divided that by the difference in the *x*-coordinates. The difference in the *y*-coordinates is 5 – 3.5 = 1.5. The difference in the *x*-coordinates is 6 – 3 = 3. So the slope is 1.5 divided by 3, which is $\dfrac{1}{2}$ (or 0.5).

Part B (1 point):

$\frac{1}{2}$ point for correct answer

$\frac{1}{2}$ point for complete support

What?	Why?
$y = \frac{1}{2}x + 2$ **OR equivalent** Note: carry-through possible based on part A	**Sample Work:** $y - 5 = \frac{1}{2}(x - 6)$ $y = \frac{1}{2}x - 3 + 5$ $y = \frac{1}{2}x + 2$ **OR** **Sample Explanation:** To determine the equation, I used the point-slope formula: $y - y_1 = m(x - x_1)$. Since the slope is $\frac{1}{2}$ (part A), I substituted that for m. I picked point K (6, 5) to substitute in for x_1 and y_1. I then simplified the equation so it would be in slope-intercept form.

Part C (2 points):

1 point for <u>each</u> correct answer

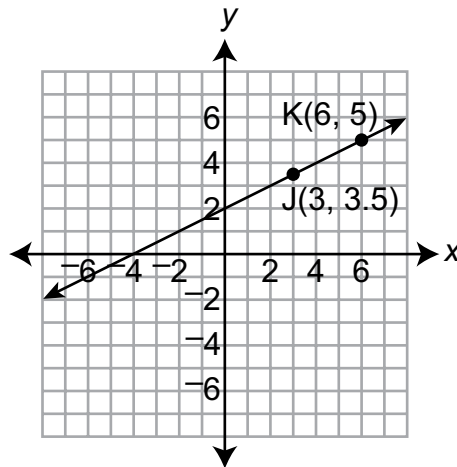| What?	Why?
Line JK and line LM could be parallel lines **OR equivalent** **AND** Line JK and line LM could be the same line (or collinear lines) **OR equivalent**	

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STUDENT RESPONSE

Response Score: 4 points

14. Points J and K lie on the same line, as shown on the coordinate plane below.

A. What is the slope of the line passing through points J and K? Show or explain all your work.

$$K = (\overset{x}{6}, \overset{y}{5})$$

$$J = (\overset{x}{3}, \overset{y}{3.5})$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{3.5 - 5}{3 - 6}$$

$$m = \frac{-1.5}{-3}$$

$$m = \frac{1}{2}$$

The slope of this line is ½

> The student has provided a correct answer and complete support.

Go to the next page to finish question 14.

GO ON ➤

14. *Continued.* Please refer to the previous page for task explanation.

B. Write the equation of the line passing through points J and K. Show or explain all your work.

$y = mx + b$

$y = \frac{1}{2}x + b$

$5 = \frac{1}{2}(6) + b$

$5 = 3 + b$

$-3 \quad -3$

$2 = b$

$\boxed{y = \frac{1}{2}x + 2}$

First, I wrote the slope-intercept Formula, then I plugged in the slope. I also plugged in the x and y values and solved for b

> The student has provided a correct equation and complete support.

Points L and M are added to the coordinate plane. The slope of $\overleftrightarrow{JK}$ is equal to the slope of $\overleftrightarrow{LM}$.

C. Describe two ways the lines could be related.

1. If both lines had the same y-intercept they will be identical

2. If the lines had different y-intercepts they would be parallel

> The student has provided two correct answers.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.
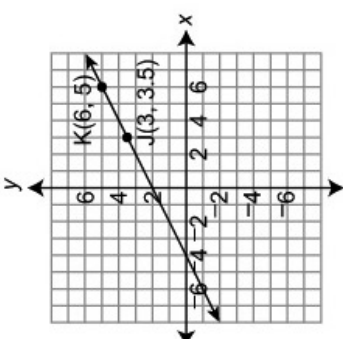
STOP

STUDENT RESPONSE

Response Score: 3 points

PART A

Question 14
Page 1 of 2

Points J and K lie on the same line, as shown on the coordinate plane below.

y

K(6, 5)

J(3, 3.5)

6
4
2

x

-6 -4 -2   2 4 6

-2
-4
-6

A. What is the slope of the line passing through points J and K? Show or explain all your work.

$slope = \dfrac{y_2 - y_1}{x_2 - x_1}$

$\dfrac{5 - 3.5}{6 - 3} \quad \dfrac{1.5}{3} = .5$

Answer = .50

The student has provided a correct answer and complete support.

37 / 1000

Next

Review/End Test   Pause   Flag   Options

Item ID

X+Y

Line Guide

STUDENT RESPONSE

PARTS B AND C

Points J and K lie on the same line, as shown on the coordinate plane below.

B. Write the equation of the line passing through points J and K. Show or explain all your work.

$y = mx + b$
$5 = .50(6) + b$
$5 = 3 + b$
$2 = b$

Answer $y = .50x + 2$

44 / 1000

> The student has provided a correct equation and complete support.

Points L and M are added to the coordinate plane. The slope of $\overleftrightarrow{JK}$ is equal to the slope of $\overleftrightarrow{LM}$.

C. Describe two ways the lines could be related.

1) If they fall on the same line
2) If they land on coordinates that simplify.

78 / 1000

> The student has provided one correct answer ("*If they fall on the same line*").
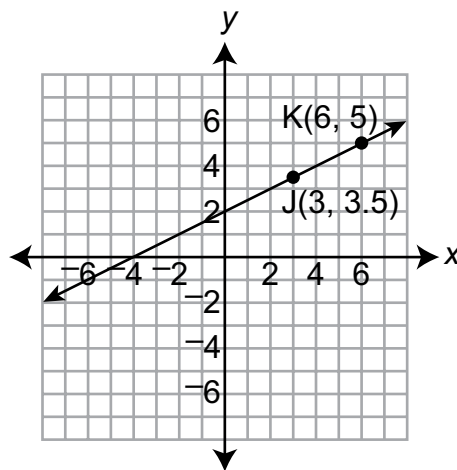
Pause   Flag   Options

Review/End Test

STUDENT RESPONSE

Response Score: 2 points

14. Points J and K lie on the same line, as shown on the coordinate plane below.

A. What is the slope of the line passing through points J and K? Show or explain all your work.

equation

$$y = \frac{1.5x}{3} + 2$$

The slope is $\frac{1.5}{3}$.

$(6, 5), (3, 3.5)$ $m = \dfrac{y_1 - y_2}{x_1 - x_2}$

$$m = \frac{5 - 3.5}{6 - 3}$$

$$\frac{1.5}{3}$$

> The student has provided a correct answer and complete support.

Go to the next page to finish question 14.

GO ON ▶

14. *Continued.* Please refer to the previous page for task explanation.

B. Write the equation of the line passing through points J and K. Show or explain all your work.

$$y = \frac{1.5x}{3} + 2$$

> The student has provided a correct equation but no support.

Points L and M are added to the coordinate plane. The slope of $\overleftrightarrow{JK}$ is equal to the slope of $\overleftrightarrow{LM}$.

C. Describe two ways the lines could be related.

① They could be parallel to one another

② They could be perpendicular to one another

> The student has provided one correct answer (*"They could be parallel to one another"*).

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

STUDENT RESPONSE

Response Score: 1 point

PART A

Question 14
Page 1 of 2

Points J and K lie on the same line, as shown on the coordinate plane below.

K(6, 5)

J(3, 3.5)

A. What is the slope of the line passing through points J and K? Show or explain all your work.

The slope of the line passing points J and K are $\frac{1}{2}$. How I found that is that I counted the spaces up and then i counted the spaces to the right. I started with J and then i moved to K. That is how i found the slope of the line while passing points J and K.

256 / 1000

The student has provided a correct answer but incomplete support. (The explanation does not describe how the numbers result in a slope of 1/2.)
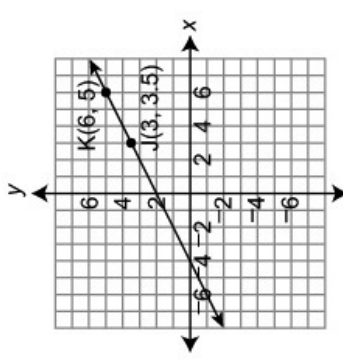
STUDENT RESPONSE

PARTS B AND C

Question 14
Page 2 of 2

Points J and K lie on the same line, as shown on the coordinate plane below.

B. Write the equation of the line passing through points J and K. Show or explain all your work.

The equation of the line through points J and K is y=j/k.

The student has provided an incorrect equation and no support.

57 / 1000

Points L and M are added to the coordinate plane. The slope of $\overleftrightarrow{JK}$ is equal to the slope of $\overleftrightarrow{LM}$.

C. Describe two ways the lines could be related.
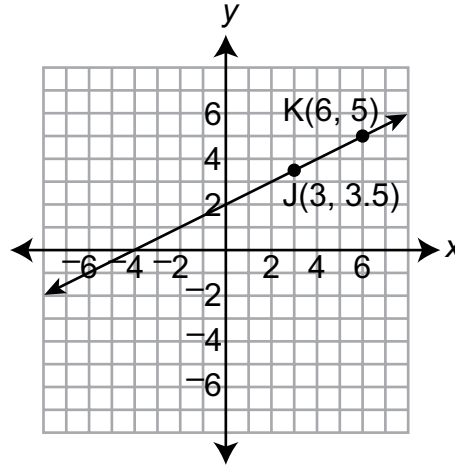
1 way that the lines are relaed is that

The student has provided no correct answers.

39 / 1000

Item ID

X+Y

Line Guide

Back   Next

Review/End Test   Pause   Flag   Options

STUDENT RESPONSE

Response Score: 0 points

14. Points J and K lie on the same line, as shown on the coordinate plane below.

A. What is the slope of the line passing through points J and K? Show or explain all your work.

$$\frac{4}{4}$$

> The student has provided an incorrect answer and no support.

Go to the next page to finish question 14.

GO ON ▶

14. ***Continued.*** Please refer to the previous page for task explanation.

B. Write the equation of the line passing through points J and K. Show or explain all your work.

$$\frac{4}{4} = \frac{1}{1} / 1$$

The student has provided an incorrect equation of the line and no support.

Points L and M are added to the coordinate plane. The slope of $\overleftrightarrow{JK}$ is equal to the slope of $\overleftrightarrow{LM}$.

C. Describe two ways the lines could be related.

One could be fractions could be the same and because they may be on the same side.

The student has provided no correct answers.

AFTER YOU HAVE CHECKED YOUR WORK, CLOSE YOUR ANSWER BOOKLET AND TEST BOOKLET SO YOUR TEACHER WILL KNOW YOU ARE FINISHED.

STOP

ALGEBRA I MODULE 2—SUMMARY DATA

MULTIPLE-CHOICE

Sample Number	Alignment	Answer Key	Depth of Knowledge	*p*-values A	*p*-values B	*p*-values C	*p*-values D
1	A1.2.1.1.1	B	2	7%	**72%**	7%	14%
2	A1.2.1.1.2	D	1	10%	9%	17%	**64%**
3	A1.2.1.1.3	A	1	**51%**	20%	17%	12%
4	A1.2.1.2.1	C	2	5%	17%	**74%**	4%
5	A1.2.1.2.2	C	2	25%	12%	**49%**	14%
6	A1.2.2.1.1	B	2	16%	**69%**	4%	11%
7	A1.2.2.1.3	A	1	**49%**	17%	21%	13%
8	A1.2.2.1.4	A	2	**63%**	6%	8%	23%
9	A1.2.3.1.1	D	2	11%	13%	15%	**61%**
10	A1.2.3.2.2	B	2	12%	**73%**	9%	6%
11	A1.2.3.2.3	C	2	11%	17%	**59%**	13%
12	A1.2.3.3.1	C	2	30%	16%	**38%**	16%

CONSTRUCTED-RESPONSE

Sample Number	Alignment	Points	Depth of Knowledge	Mean Score
13	A1.2.1	4	2	2.23
14	A1.2.2	4	2	1.66

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Keystone Exams
Algebra I

Item and Scoring Sampler 2018