The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Tuesday, August 13, 2019 — 8:30 to 11:30 a.m., only

Student Name _____

School Name _____

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Print your name and the name of your school on the lines above.

A separate answer sheet for **Part I** has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet.

This examination has four parts, with a total of 37 questions. You must answer all questions in this examination. Record your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in **Parts II**, **III**, and **IV** directly in this booklet. All work should be written in pen, except for graphs and drawings, which should be done in pencil. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale.

The formulas that you may need to answer some questions in this examination are found at the end of the examination. This sheet is perforated so you may remove it from this booklet.

Scrap paper is not permitted for any part of this examination, but you may use the blank spaces in this booklet as scrap paper. A perforated sheet of scrap graph paper is provided at the end of this booklet for any question for which graphing may be helpful but is not required. You may remove this sheet from this booklet. Any work done on this sheet of scrap graph paper will *not* be scored.

When you have completed the examination, you must sign the statement printed at the end of the answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.

Notice …

A graphing calculator and a straightedge (ruler) must be available for you to use while taking this examination.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [48]

1 Bryan's hockey team is purchasing jerseys. The company charges $250 for a onetime set-up fee and $23 for each printed jersey. Which expression represents the total cost of x number of jerseys for the team?

(1) $23x$ (3) $23x + 250$

(2) $23 + 250x$ (4) $23(x + 250)$

2 Which table represents a function?

x	y
2	−3
3	0
4	−3
2	1

(1)

x	y
−3	0
−2	1
−3	2
2	3

(3)

x	y
1	2
1	3
1	4
1	5

(2)

x	y
−2	−4
0	2
2	4
4	6

(4)

3 Which expression is equivalent to $2(x^2 − 1) + 3x(x − 4)$?

(1) $5x^2 − 5$ (3) $5x^2 − 12x − 1$

(2) $5x^2 − 6$ (4) $5x^2 − 12x − 2$

4 The value of x that satisfies the equation $\dfrac{4}{3} = \dfrac{x + 10}{15}$ is

(1) −6   (3) 10

(2) 5   (4) 30

5 Josh graphed the function $f(x) = -3(x - 1)^2 + 2$. He then graphed the function $g(x) = -3(x - 1)^2 - 5$ on the same coordinate plane. The vertex of $g(x)$ is

(1) 7 units below the vertex of $f(x)$

(2) 7 units above the vertex of $f(x)$

(3) 7 units to the right of the vertex of $f(x)$

(4) 7 units to the left of the vertex of $f(x)$

6 A survey was given to 12th-grade students of West High School to determine the location for the senior class trip. The results are shown in the table below.

	Niagara Falls	Darien Lake	New York City
Boys	56	74	103
Girls	71	92	88

To the *nearest percent,* what percent of the boys chose Niagara Falls?

(1) 12   (3) 44

(2) 24   (4) 56

7 Which type of function is shown in the graph below?
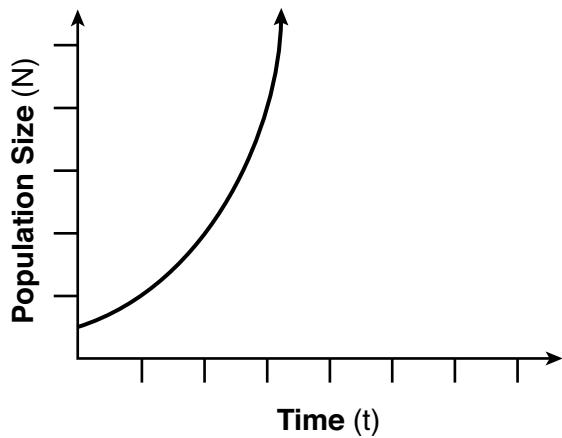
(1) linear   (3) square root

(2) exponential   (4) absolute value

8 The expression $16x^2 - 81$ is equivalent to

(1) $(8x - 9)(8x + 9)$ (3) $(4x - 9)(4x + 9)$

(2) $(8x - 9)(8x - 9)$ (4) $(4x - 9)(4x - 9)$

9 The owner of a landscaping business wants to know how much time, on average, his workers spend mowing one lawn. Which is the most appropriate rate with which to calculate an answer to his question?

(1) lawns per employee   (3) employee per lawns

(2) lawns per day   (4) hours per lawn

10 A ball is thrown into the air from the top of a building. The height, $h(t)$, of the ball above the ground t seconds after it is thrown can be modeled by $h(t) = -16t^2 + 64t + 80$. How many seconds after being thrown will the ball hit the ground?

(1) 5   (3) 80

(2) 2   (4) 144

11 Which equation is equivalent to $y = x^2 + 24x - 18$?

(1) $y = (x + 12)^2 - 162$ (3) $y = (x - 12)^2 - 162$

(2) $y = (x + 12)^2 + 126$ (4) $y = (x - 12)^2 + 126$

12 When $(x)(x - 5)(2x + 3)$ is expressed as a polynomial in standard form, which statement about the resulting polynomial is true?

(1) The constant term is 2.

(2) The leading coefficient is 2.

(3) The degree is 2.

(4) The number of terms is 2.

13 The population of a city can be modeled by $P(t) = 3810(1.0005)^{7t}$, where $P(t)$ is the population after t years. Which function is approximately equivalent to $P(t)$?

(1) $P(t) = 3810(0.1427)^t$ (3) $P(t) = 26{,}670(0.1427)^t$

(2) $P(t) = 3810(1.0035)^t$ (4) $P(t) = 26{,}670(1.0035)^t$

**14** The functions $f(x)$ and $g(x)$ are graphed on the set of axes below.
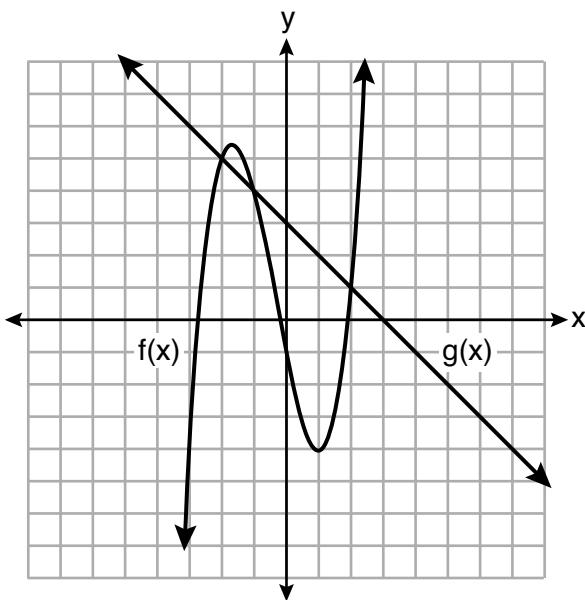
For which value of x is $f(x) \neq g(x)$?

(1) -1 (3) 3

(2) 2   (4) -2

15 What is the range of the box plot shown below?
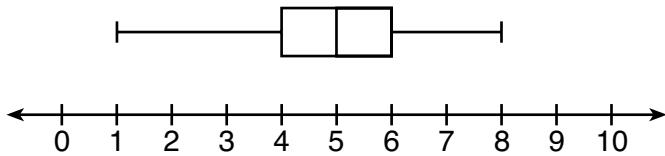
(1) 7   (3) 3

(2) 2   (4) 4

16 Which expression is *not* equivalent to $2x^2 + 10x + 12$?

(1) $(2x + 4)(x + 3)$ (3) $(2x + 3)(x + 4)$

(2) $(2x + 6)(x + 2)$ (4) $2(x + 3)(x + 2)$

17 The quadratic functions $r(x)$ and $q(x)$ are given below.

x	r(x)
−4	−12
−3	−15
−2	−16
−1	−15
0	−12
1	7

$$q(x) = x^2 + 2x - 8$$

The function with the *smallest* minimum value is

(1) $q(x)$, and the value is -9 (3) $r(x)$, and the value is -16

(2) $q(x)$, and the value is -1 (4) $r(x)$, and the value is -2

18 A child is playing outside. The graph below shows the child's distance, $d(t)$, in yards from home over a period of time, t, in seconds.
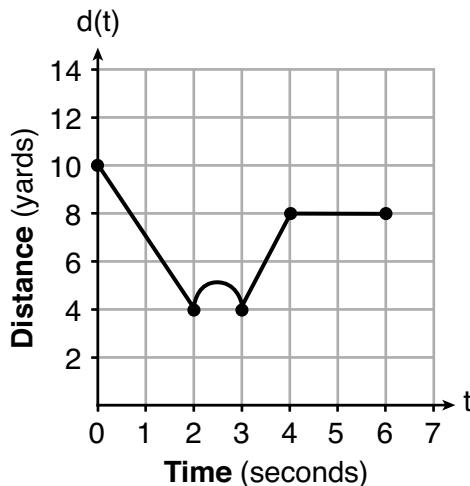
Which interval represents the child constantly moving closer to home?

(1) $0 \le t \le 2$ (3) $3 \le t \le 4$

(2) $2 \le t \le 3$ (4) $4 \le t \le 6$

19 If $a_1 = 6$ and $a_n = 3 + 2(a_{n-1})^2$, then a_2 equals

(1) 75   (3) 180

(2) 147   (4) 900

20 The length of a rectangular patio is 7 feet more than its width, w. The area of a patio, $A(w)$, can be represented by the function

(1) $A(w) = w + 7$ (3) $A(w) = 4w + 14$

(2) $A(w) = w^2 + 7w$ (4) $A(w) = 4w^2 + 28w$

21 A dolphin jumps out of the water and then back into the water. His jump could be graphed on a set of axes where x represents time and y represents distance above or below sea level. The domain for this graph is best represented using a set of

(1) integers   (3) real numbers

(2) positive integers   (4) positive real numbers

22 Which system of linear equations has the same solution as the one shown below?

$$x - 4y = -10$$
$$x + y = 5$$

(1) $5x = 10$ (3) $-3x = -30$
   $x + y = 5$ $x + y = 5$

(2) $-5y = -5$ (4) $-5y = -5$
   $x + y = 5$ $x - 4y = -10$

23 Which interval represents the range of the function $h(x) = 2x^2 - 2x - 4$?

(1) $(0.5, \infty)$ (3) $[0.5, \infty)$

(2) $(-4.5, \infty)$ (4) $[-4.5, \infty)$

24 What is a common ratio of the geometric sequence whose first term is 5 and third term is 245?

(1) 7   (3) 120

(2) 49   (4) 240

Part II

Answer all 8 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil.   [16]

**25** If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

26 A student is in the process of solving an equation. The original equation and the first step are shown below.

$$\text{Original:} \quad 3a + 6 = 2 - 5a + 7$$
$$\text{Step one:} \quad 3a + 6 = 2 + 7 - 5a$$

Which property did the student use for the first step? Explain why this property is correct.

27 On the set of axes below, graph the line whose equation is $2y = -3x - 2$.
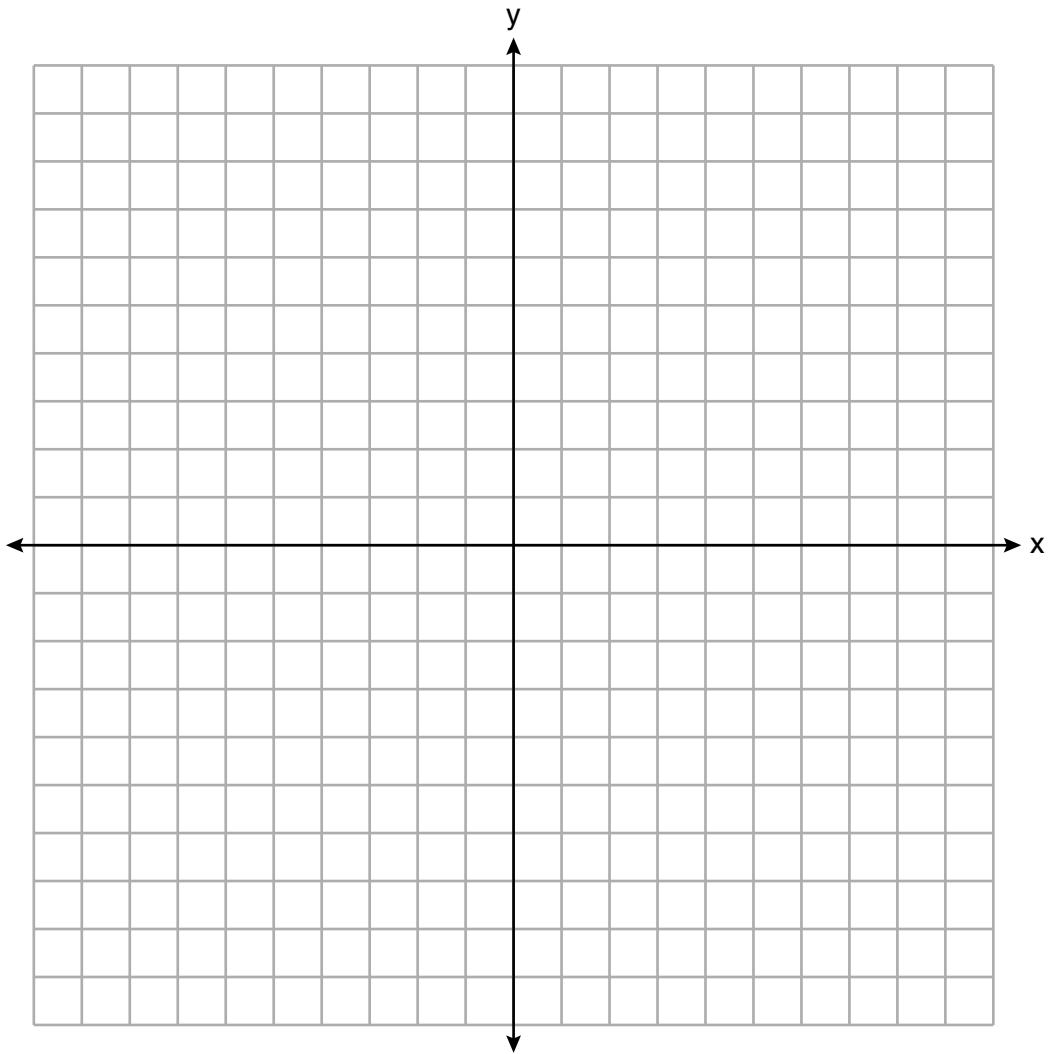
This linear equation contains the point $(2,k)$. State the value of k.

28 The formula $a = \dfrac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, v_f, in terms of initial velocity, v_i, acceleration, a, and time, t.

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for x.

30 Is the product of two irrational numbers always irrational? Justify your answer.

31 Solve $6x^2 - 42 = 0$ for the exact values of x.

32 Graph the function: $h(x) = \begin{cases} 2x - 3, & x < 0 \\ x^2 - 4x - 5, & 0 \le x \le 5 \end{cases}$
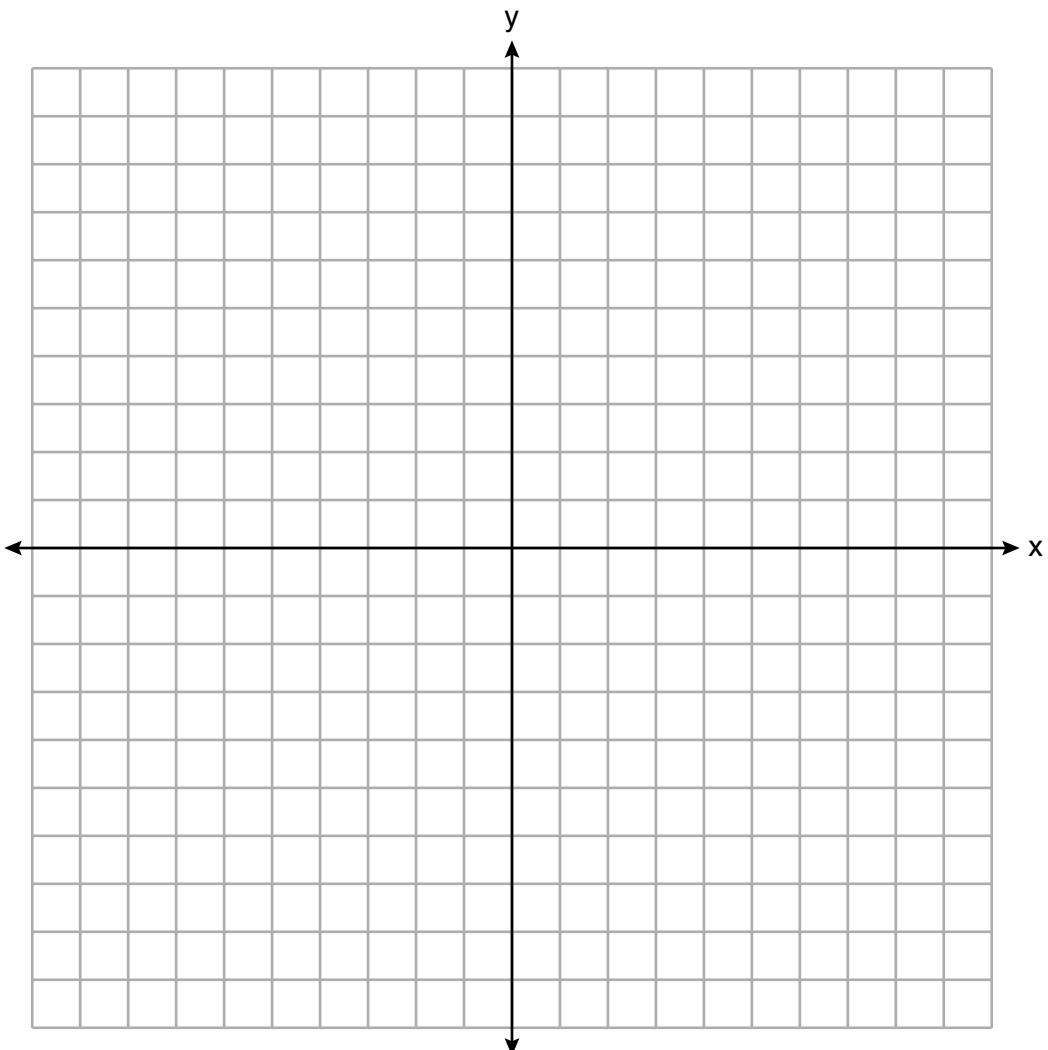
Part III

Answer all 4 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

33 On the set of axes below, graph the following system of inequalities:

$$2x + y \geq 8$$
$$y - 5 < 3x$$
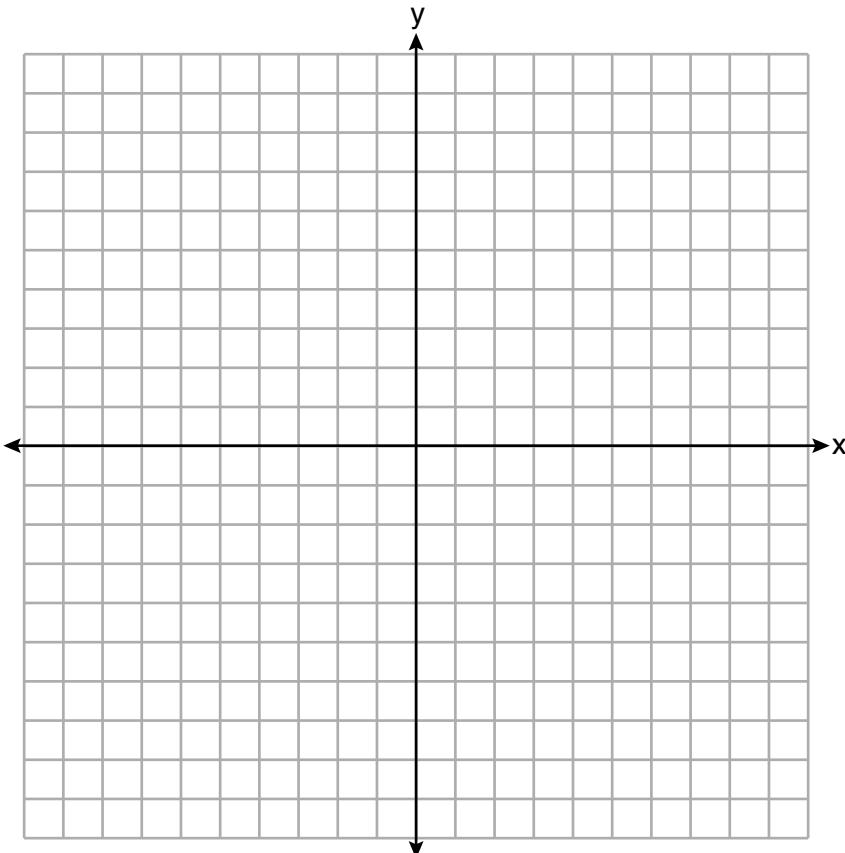
Determine if the point $(1,8)$ is in the solution set. Explain your answer.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

35 Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

Distance From Times Square (city blocks) (x)	0	0	1	1	3	4	7	11	14	19
Cost of a Room (dollars) (y)	293	263	244	224	185	170	219	153	136	111

Write the linear regression equation for this data set. Round all values to the *nearest hundredth*.

State the correlation coefficient for this data set, to the *nearest hundredth*.

Explain what the sign of the correlation coefficient suggests in the context of the problem.

36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Accumulated Snowfall (in inches)

y

10
9
8
7
6
5
4
3
2
1

3 6 9 12 15 18 x

Elapsed Time (in hours)

Determine the average rate of snowfall over the length of the storm. State the rate, to the *nearest hundredth of an inch per hour*.

Part IV

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided to determine your answer. Note that diagrams are not necessarily drawn to scale. A correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

Determine algebraically how many of each type of chicken Allysa purchased.

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

[20]
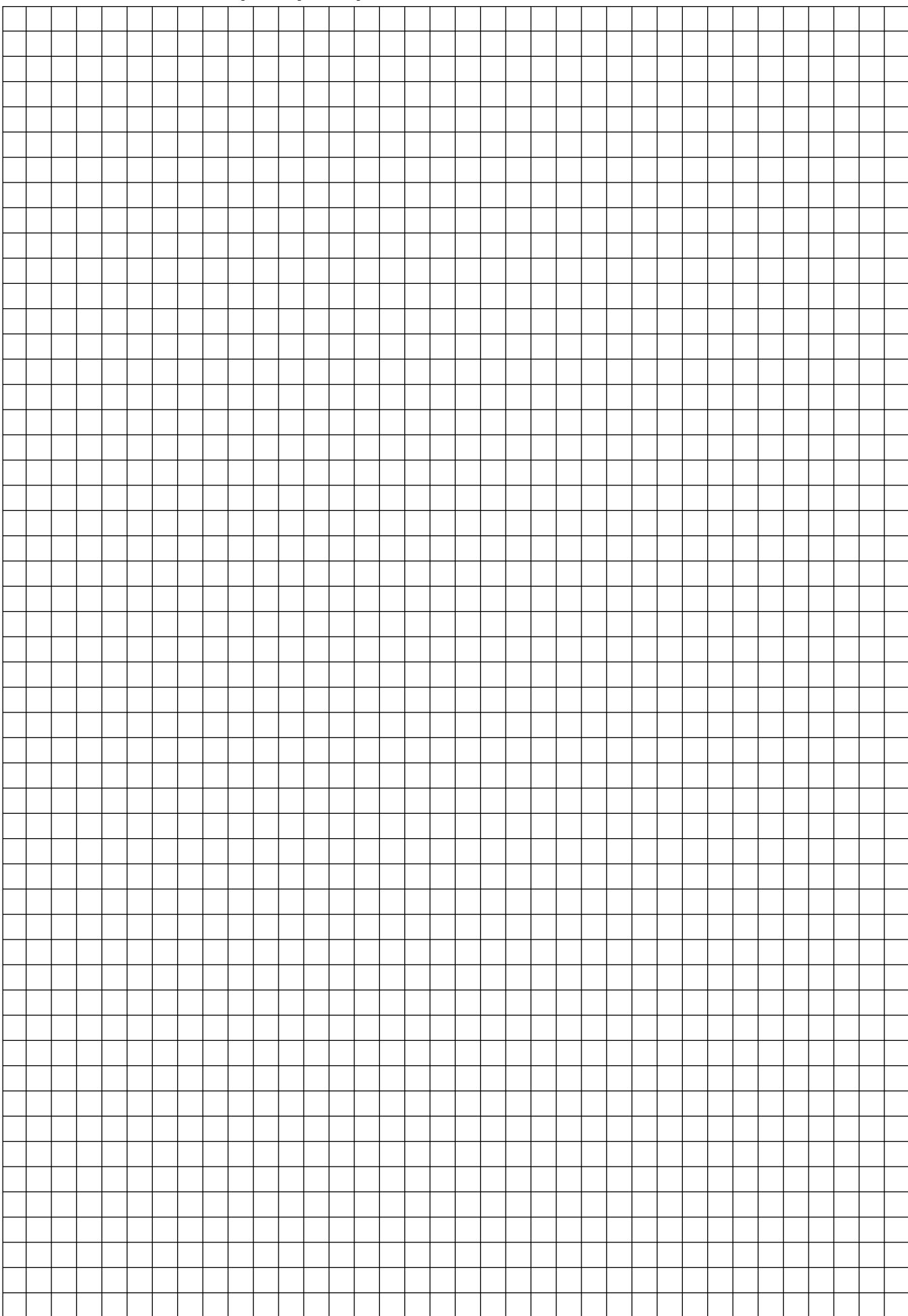
High School Math Reference Sheet

1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5280 feet	1 pound = 0.454 kilogram	1 quart = 2 pints
1 mile = 1760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallon
		1 liter = 1000 cubic centimeters

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pyramid	$V = \frac{1}{3}Bh$

Pythagorean Theorem	$a^2 + b^2 = c^2$
Quadratic Formula	$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Arithmetic Sequence	$a_n = a_1 + (n - 1)d$
Geometric Sequence	$a_n = a_1 r^{n-1}$
Geometric Series	$S_n = \dfrac{a_1 - a_1 r^n}{1 - r}$ where $r \neq 1$
Radians	1 radian = $\dfrac{180}{\pi}$ degrees
Degrees	1 degree = $\dfrac{\pi}{180}$ radians
Exponential Growth/Decay	$A = A_0 e^{k(t - t_0)} + B_0$

ALGEBRA I

Printed on Recycled Paper

The State Education Department / The University of the State of New York
Regents Examination in Algebra I – August 2019
Scoring Key: Part I (Multiple-Choice Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Algebra I	August '19	1	3	MC	2	1
Algebra I	August '19	2	4	MC	2	1
Algebra I	August '19	3	4	MC	2	1
Algebra I	August '19	4	3	MC	2	1
Algebra I	August '19	5	1	MC	2	1
Algebra I	August '19	6	2	MC	2	1
Algebra I	August '19	7	2	MC	2	1
Algebra I	August '19	8	3	MC	2	1
Algebra I	August '19	9	4	MC	2	1
Algebra I	August '19	10	1	MC	2	1
Algebra I	August '19	11	1	MC	2	1
Algebra I	August '19	12	2	MC	2	1
Algebra I	August '19	13	2	MC	2	1
Algebra I	August '19	14	3	MC	2	1
Algebra I	August '19	15	1	MC	2	1
Algebra I	August '19	16	3	MC	2	1
Algebra I	August '19	17	3	MC	2	1
Algebra I	August '19	18	1	MC	2	1
Algebra I	August '19	19	1	MC	2	1
Algebra I	August '19	20	2	MC	2	1
Algebra I	August '19	21	4	MC	2	1
Algebra I	August '19	22	1	MC	2	1
Algebra I	August '19	23	4	MC	2	1
Algebra I	August '19	24	1	MC	2	1

Regents Examination in Algebra I – August 2019
Scoring Key: Parts II, III, and IV (Constructed-Response Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Algebra I	August '19	25	-	CR	2	1
Algebra I	August '19	26	-	CR	2	1
Algebra I	August '19	27	-	CR	2	1
Algebra I	August '19	28	-	CR	2	1
Algebra I	August '19	29	-	CR	2	1
Algebra I	August '19	30	-	CR	2	1
Algebra I	August '19	31	-	CR	2	1
Algebra I	August '19	32	-	CR	2	1
Algebra I	August '19	33	-	CR	4	1
Algebra I	August '19	34	-	CR	4	1
Algebra I	August '19	35	-	CR	4	1
Algebra I	August '19	36	-	CR	4	1
Algebra I	August '19	37	-	CR	6	1

Key
MC = Multiple-choice question
CR = Constructed-response question

The chart for determining students' final examination scores for the **August 2019 Regents Examination in Algebra I** will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on the day of the examination. Conversion charts provided for the previous administrations of the Regents Examination in Algebra I must NOT be used to determine students' final scores for this administration.

FOR TEACHERS ONLY

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Tuesday, August 13, 2019 — 8:30 to 11:30 a.m., only

RATING GUIDE

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: http://www.p12.nysed.gov/assessment/ and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

The Department is providing supplemental scoring guidance, the "Model Response Set," for the Regents Examination in Algebra I. This guidance is intended to be part of the scorer training. Schools are encouraged to incorporate the Model Response Sets into the scorer training or to use them as additional information during scoring. While not reflective of all scenarios, the model responses selected for the Model Response Set illustrate how less common student responses to constructed-response questions may be scored. The Model Response Set will be available on the Department's web site at http://www.nysedregents.org/algebraone/.

Mechanics of Rating

The following procedures are to be followed for scoring student answer papers for the Regents Examination in Algebra I. More detailed information about scoring is provided in the publication *Information Booklet for Scoring the Regents Examination in Algebra I*.

Do *not* attempt to correct the student's work by making insertions or changes of any kind. In scoring the constructed-response questions, use check marks to indicate student errors. Unless otherwise specified, mathematically correct variations in the answers will be allowed. Units need not be given when the wording of the questions allows such omissions.

Each student's answer paper is to be scored by a minimum of three mathematics teachers. No one teacher is to score more than approximately one-third of the constructed-response questions on a student's paper. Teachers may not score their own students' answer papers. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Schools are not permitted to rescore any of the constructed-response questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Raters should record the student's scores for all questions and the total raw score on the student's separate answer sheet. Then the student's total raw score should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Tuesday, August 13, 2019. Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score. The student's scale score should be entered in the box provided on the student's separate answer sheet. The scale score is the student's final examination score.

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examination in Algebra I are designed to provide a systematic, consistent method for awarding credit. The rubrics are not to be considered all-inclusive; it is impossible to anticipate all the different methods that students might use to solve a given problem. Each response must be rated carefully using the teacher's professional judgment and knowledge of mathematics; all calculations must be checked. The specific rubrics for each question must be applied consistently to all responses. In cases that are not specifically addressed in the rubrics, raters must follow the general rating guidelines in the publication *Information Booklet for Scoring the Regents Examination in Algebra I*, use their own professional judgment, confer with other mathematics teachers, and/or contact the State Education Department for guidance. During each Regents Examination administration period, rating questions may be referred directly to the Education Department. The contact numbers are sent to all schools before each administration period.

II. Full-Credit Responses

A full-credit response provides a complete and correct answer to all parts of the question. Sufficient work is shown to enable the rater to determine how the student arrived at the correct answer.

When the rubric for the full-credit response includes one or more examples of an acceptable method for solving the question (usually introduced by the phrase "such as"), it does not mean that there are no additional acceptable methods of arriving at the correct answer. Unless otherwise specified, mathematically correct alternative solutions should be awarded credit. The only exceptions are those questions that specify the type of solution that must be used; e.g., an algebraic solution or a graphic solution. A correct solution using a method other than the one specified is awarded half the credit of a correct solution using the specified method.

III. Appropriate Work

Full-Credit Responses: The directions in the examination booklet for all the constructed-response questions state: "Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc." The student has the responsibility of providing the correct answer **and** showing how that answer was obtained. The student must "construct" the response; the teacher should not have to search through a group of seemingly random calculations scribbled on the student paper to ascertain what method the student may have used.

Responses With Errors: Rubrics that state "Appropriate work is shown, but…" are intended to be used with solutions that show an essentially complete response to the question but contain certain types of errors, whether computational, rounding, graphing, or conceptual. If the response is incomplete; i.e., an equation is written but not solved or an equation is solved but not all of the parts of the question are answered, appropriate work has **not** been shown. Other rubrics address incomplete responses.

IV. Multiple Errors

Computational Errors, Graphing Errors, and Rounding Errors: Each of these types of errors results in a 1-credit deduction. Any combination of two of these types of errors results in a 2-credit deduction. No more than 2 credits should be deducted for such mechanical errors in a 4-credit question and no more than 3 credits should be deducted in a 6-credit question. The teacher must carefully review the student's work to determine what errors were made and what type of errors they were.

Conceptual Errors: A conceptual error involves a more serious lack of knowledge or procedure. Examples of conceptual errors include using the incorrect formula for the area of a figure, choosing the incorrect trigonometric function, or multiplying the exponents instead of adding them when multiplying terms with exponents.

If a response shows repeated occurrences of the same conceptual error, the student should not be penalized twice. If the same conceptual error is repeated in responses to other questions, credit should be deducted in each response.

For 4- and 6-credit questions, if a response shows one conceptual error and one computational, graphing, or rounding error, the teacher must award credit that takes into account both errors. Refer to the rubric for specific scoring guidelines.

Part II

For each question, use the specific criteria to award a maximum of 2 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(25) **[2]** −8, and correct work is shown.

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

or

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

or

[1] −8, 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.

(26) **[2]** Commutative, and a correct explanation is written.

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

or

[1] Commutative, but the explanation is missing or incorrect.

or

[1] A correct explanation is written, but the property is missing or incorrect.

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

(27) **[2]** A correct graph is drawn, and -4 is stated.

[1] Appropriate work is shown, but one computational or graphing error is made.

or

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

or

[1] A correct graph is drawn, but no further correct work is shown.

or

[1] Appropriate work is shown to find -4, but no graph is drawn.

[0] -4, but 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.

(28) **[2]** $v_f = at + v_i$, and correct work is shown.

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

or

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

or

[1] $v_f = at + v_i$, 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.

(29) **[2]** $x > \dfrac{10}{3}$ or $x > 3.\overline{3}$, and correct work is shown.

[1] Appropriate work is shown, but one computational or rounding error is made.

or

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

or

[1] $x > \dfrac{10}{3}$, 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.

(30) **[2]** A negative response is indicated, and a correct justification is given.

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

or

[1] An incomplete justification is given, but an appropriate response is indicated.

[0] No, but the justification is missing or incorrect.

or

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

(31) **[2]** $\pm\sqrt{7}$, and correct work is shown.

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

or

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

or

[1] Appropriate work is shown, but only one root is stated.

or

[1] Appropriate work is shown, but the answers are expressed as decimals.

or

[1] $\pm\sqrt{7}$, 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.

(32) **[2]** A correct graph is drawn over the given domains.

[1] Appropriate work is shown, but one graphing error is made.

or

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

or

[1] Either $h(x) = 2x - 3$ or $h(x) = x^2 - 4x - 5$ is graphed correctly over its given domain.

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

Part III

For each question, use the specific criteria to award a maximum of 4 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(33) **[4]** The system of inequalities is graphed correctly and at least one is labeled, and a correct explanation indicating a negative response is written.

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

or

[3] Appropriate work is shown, but the explanation is incomplete.

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

or

[2] The system of inequalities is graphed correctly and at least one is labeled, but no further correct work is shown.

or

[2] A correct explanation indicating a negative response is written, but no further correct work is shown.

[1] One inequality is graphed correctly, but no further correct work is shown.

or

[1] $2x + y = 8$ and $y - 5 = 3x$ are graphed correctly and at least one is labeled, but no further correct work is shown.

[0] No, but no further correct 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.

(34) **[4]** $A(t) = 5000(1.012)^t$, 1200, and correct work is shown.

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

or

[3] Appropriate work is shown, but the expression is written instead of an equation.

or

[3] Appropriate work is shown to find $A(32)$ and $A(17)$, but 1200 is not stated.

or

[3] $A(t) = 5000(1.012)^t$ and 1200 are stated, but no work is shown.

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

or

[2] $A(t) = 5000(1.012)^t$, but no further correct work is shown.

[1] The expression $5000(1.012)^t$ is written, but no further correct work is shown.

or

[1] 1200, 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.

(35) **[4]** $y = -7.76x + 246.34$, -0.88, and a correct explanation in context is written.

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

or

[3] Appropriate work is shown, but an expression is written instead of an equation.

or

[3] Appropriate work is shown, but the explanation is missing or incorrect.

[2] $y = -7.76x + 246.34$ is written, but no further correct work is shown.

or

[2] -0.88, and a correct explanation is written, but no further correct work is shown.

[1] $-7.76x + 246.34$ is written, but no further correct work is shown.

or

[1] -0.88, but no further correct work is shown.

or

[1] A correct explanation in context is written, but no further correct 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.

(36) **[4]** A correct graph is drawn, and 0.59 is stated.

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

or

[3] A correct graph is drawn, but no further correct work is shown.

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

[1] 0.59 is stated, but no further correct 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.

Part IV

For this question, use the specific criteria to award a maximum of 6 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(37) **[6]** $3.75A + 2.50D = 35$ and $A + D = 12$ are written, $A = 4$, $D = 8$, and correct algebraic work is shown, and 22.50, and correct work is shown.

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

or

[5] Appropriate work is shown to find 9 dozen, but the amount of money is missing or incorrect.

or

[5] Appropriate work is shown, but a method other than algebraic is used to find $A = 4$ and $D = 8$.

or

[5] One equation is incorrect, but the system is solved appropriately.

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

or

[4] Appropriate work is shown to find $A = 4$ and $D = 8$, but no further correct work is shown.

[3] Appropriate work is shown to find either $A = 4$ or $D = 8$, but no further correct work is shown.

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

[1] Only one correct equation is written.

or

[1] $A = 4$ and $D = 8$, 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.

Map to the Learning Standards
Algebra I
August 2019

Question	Type	Credits	Cluster
1	Multiple Choice	2	A-SSE.A
2	Multiple Choice	2	F-IF.A
3	Multiple Choice	2	A-APR.A
4	Multiple Choice	2	A-REI.B
5	Multiple Choice	2	F-BF.B
6	Multiple Choice	2	S-ID.B
7	Multiple Choice	2	F-LE.A
8	Multiple Choice	2	A-SSE.A
9	Multiple Choice	2	N-Q.A
10	Multiple Choice	2	A-APR.B
11	Multiple Choice	2	A-SSE.B
12	Multiple Choice	2	A-SSE.A
13	Multiple Choice	2	A-SSE.B
14	Multiple Choice	2	A-REI.D
15	Multiple Choice	2	S-ID.A
16	Multiple Choice	2	A-SSE.A
17	Multiple Choice	2	F-IF.C
18	Multiple Choice	2	F-IF.B
19	Multiple Choice	2	F-IF.A
20	Multiple Choice	2	F-BF.A

21	Multiple Choice	2	F-IF.B
22	Multiple Choice	2	A-REI.C
23	Multiple Choice	2	F-IF.A
24	Multiple Choice	2	F-LE.A
25	Constructed Response	2	F-IF.A
26	Constructed Response	2	A-REI.A
27	Constructed Response	2	A-REI.D
28	Constructed Response	2	A-CED.A
29	Constructed Response	2	A-REI.B
30	Constructed Response	2	N-RN.B
31	Constructed Response	2	A-REI.B
32	Constructed Response	2	F-IF.C
33	Constructed Response	4	A-REI.D
34	Constructed Response	4	A-CED.A
35	Constructed Response	4	S-ID.C
36	Constructed Response	4	F-IF.B
37	Constructed Response	6	A-CED.A

Regents Examination in Algebra I

August 2019

Chart for Converting Total Test Raw Scores to
Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the August 2019 Regents Examination in Algebra I* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ by Tuesday, August 13, 2019. Conversion charts provided for previous administrations of the Regents Examination in Algebra I must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to http://www.forms2.nysed.gov/emsc/osa/exameval/reexameval.cfm.

2. Select the test title.

3. Complete the required demographic fields.

4. Complete each evaluation question and provide comments in the space provided.

5. Click the SUBMIT button at the bottom of the page to submit the completed form.

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Tuesday, August 13, 2019 — 8:30 to 11:30 a.m.

MODEL RESPONSE SET

Table of Contents

25 If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

$$g(x) = -4x^2 - 3x + 2$$

X	Y
-3	-25
-2	(-8)
-1	1
0	2
1	-5
2	-20
3	-43

-8

Score 2: The student gave a complete and correct response.

25 If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

$$-4(-2)^2 - 3(-2) + 2 = -8$$

Score 2: The student gave a complete and correct response.

25 If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

$$g(-2) = -4(-2)^2 - 3(-2) + 2$$
$$g(-2) = 8^2 - 3(-2) + 2$$
$$g(-2) = 64 + 6 + 2$$
$$g(-2) = 64 + 8$$
$$g(-2) = 72$$

Score 1: The student made an error when simplifying $-4(-2)^2$.

25 If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

$$-4(-2)^2 - 3(-2) + 2$$

$$-8^2 \quad -3(-2) + 2$$

$$-64 \quad -6 + 2$$

$$-68$$

Score 0: The student made more than one computational error.

25 If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

(labels above terms: a over $4x^2$, b over $3x$, c over 2)

$$y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y = \frac{-(3) \pm \sqrt{(-3)^2 - 4(-4)(2)}}{2(-4)}$$

$$y = \frac{3 \pm \sqrt{41}}{-8} \qquad y = \frac{3 + \sqrt{41}}{-8} \qquad y = \frac{3 - \sqrt{41}}{-8}$$

$$y = -1.2 \qquad y = .43$$

Score 0: The student gave a completely irrelevant response.

26 A student is in the process of solving an equation. The original equation and the first step are shown below.

$$\text{Original:} \quad 3a + 6 = 2 - 5a + 7$$
$$\text{Step one:} \quad 3a + 6 = 2 + 7 - 5a$$

Which property did the student use for the first step? Explain why this property is correct.

Commutative property of addition – because they just switched the two numbers (-5a and 7) which is ok

Score 2: The student gave a complete and correct response.

26 A student is in the process of solving an equation. The original equation and the first step are shown below.

$$\text{Original:} \quad 3a + 6 = 2 - 5a + 7$$
$$\text{Step one:} \quad 3a + 6 = 2 + 7 - 5a$$

Which property did the student use for the first step? Explain why this property is correct.

the student chose Communitive property.

Score 1: The student did not give an explanation.

26 A student is in the process of solving an equation. The original equation and the first step are shown below.

Original: $3a + 6 = 2 - 5a + 7$
Step one: $3a + 6 = 2 + 7 - 5a$

Which property did the student use for the first step? Explain why this property is correct.

The student used Communitive Property. You can move part of the equation.

Score 1: The student gave an incorrect explanation.

26 A student is in the process of solving an equation. The original equation and the first step are shown below.

$$\text{Original:} \quad 3a + 6 = 2 - 5a + 7$$
$$\text{Step one:} \quad 3a + 6 = 2 + 7 - 5a$$

Which property did the student use for the first step? Explain why this property is correct.

The student used the additive property. they just switched things around

Score 0: The student gave a completely incorrect response.

27 On the set of axes below, graph the line whose equation is $2y = -3x - 2$.

$(2,-4)$
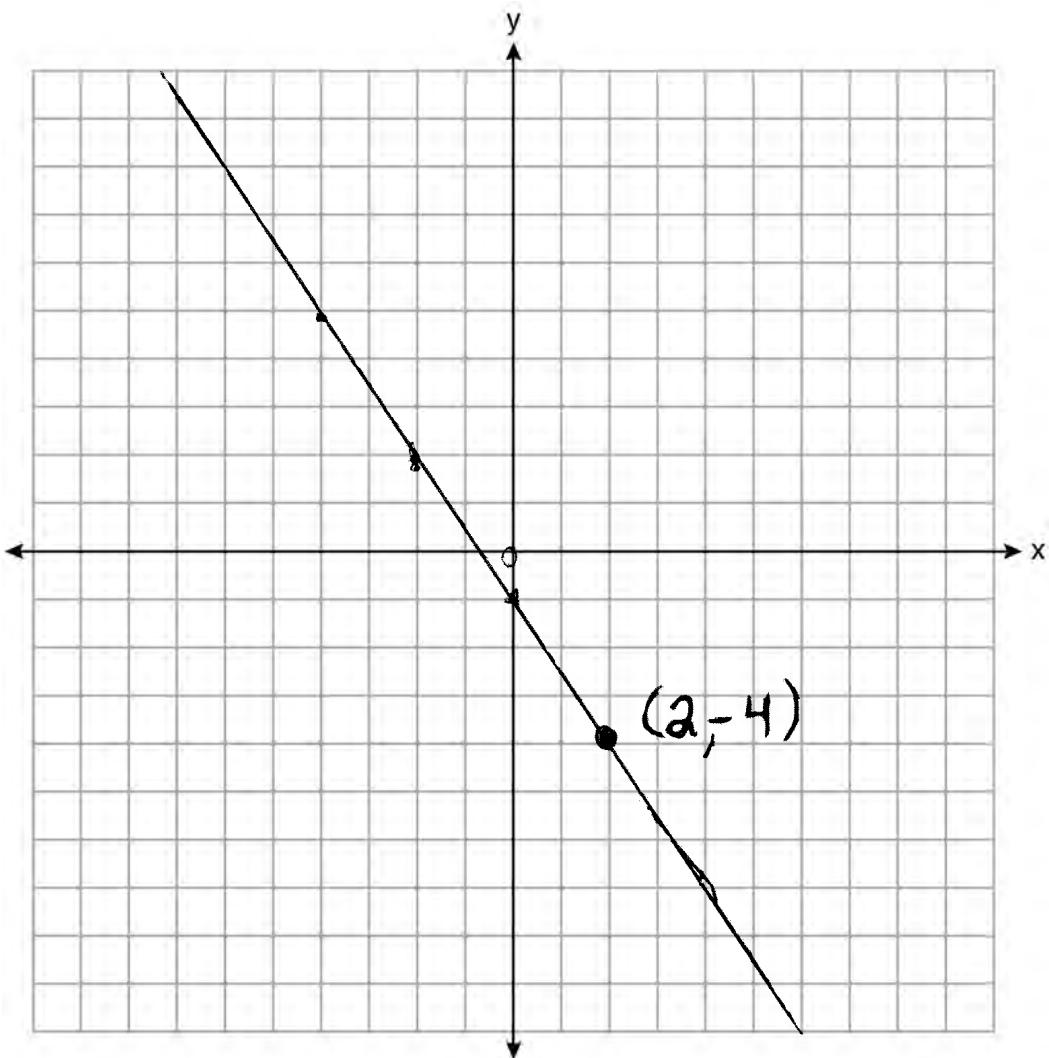
This linear equation contains the point $(2,k)$. State the value of k. -4

Score 2: The student gave a complete and correct response.

27 On the set of axes below, graph the line whose equation is $2y = -3x - 2$.

$2y = -3x - 2$

$y = \frac{-3}{2}x - 1$
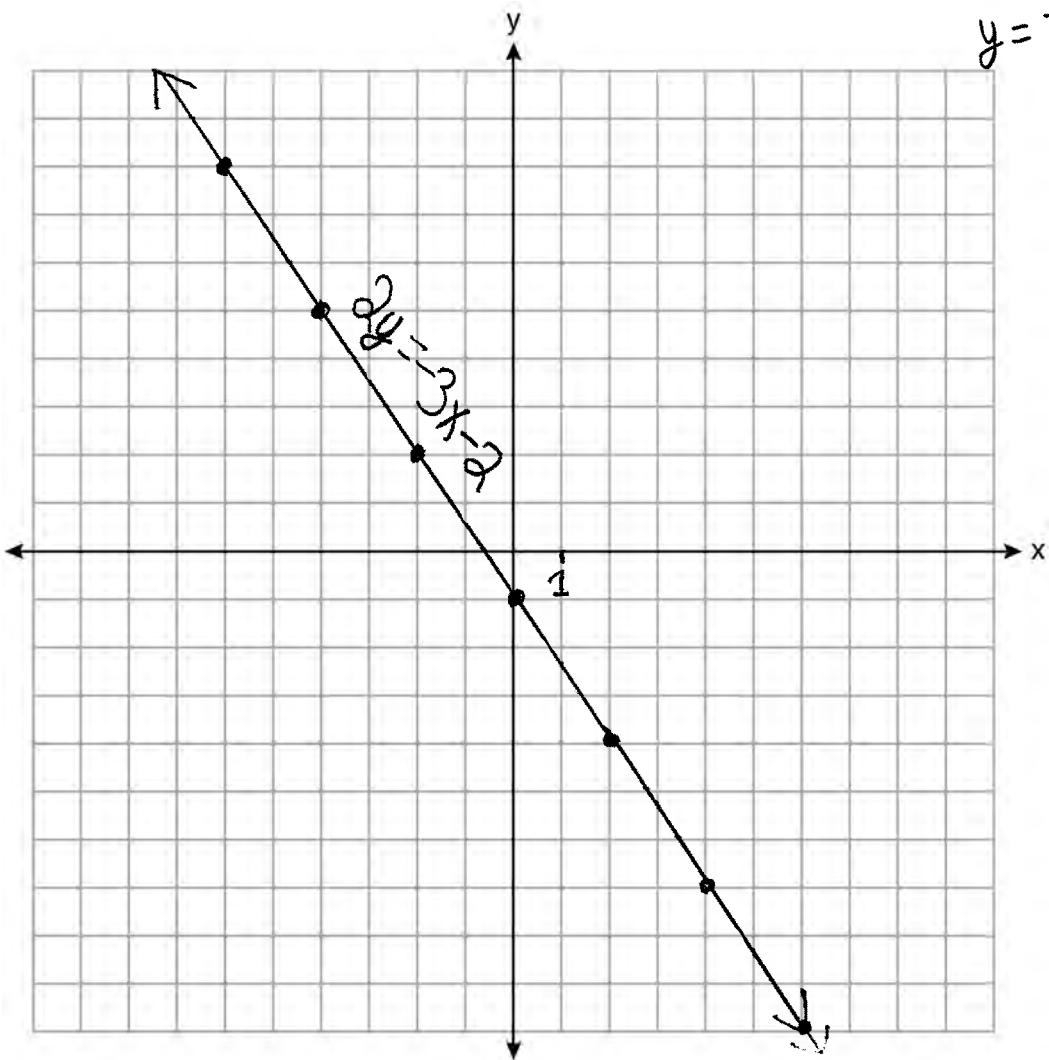
This linear equation contains the point $(2,k)$. State the value of k.

$(2, K)$ $K = -4$

$2(-4) = -3(2) - 2$

$-8 = -8$

Score 2:   The student gave a complete and correct response.

27 On the set of axes below, graph the line whose equation is $2y = -3x - 2$.
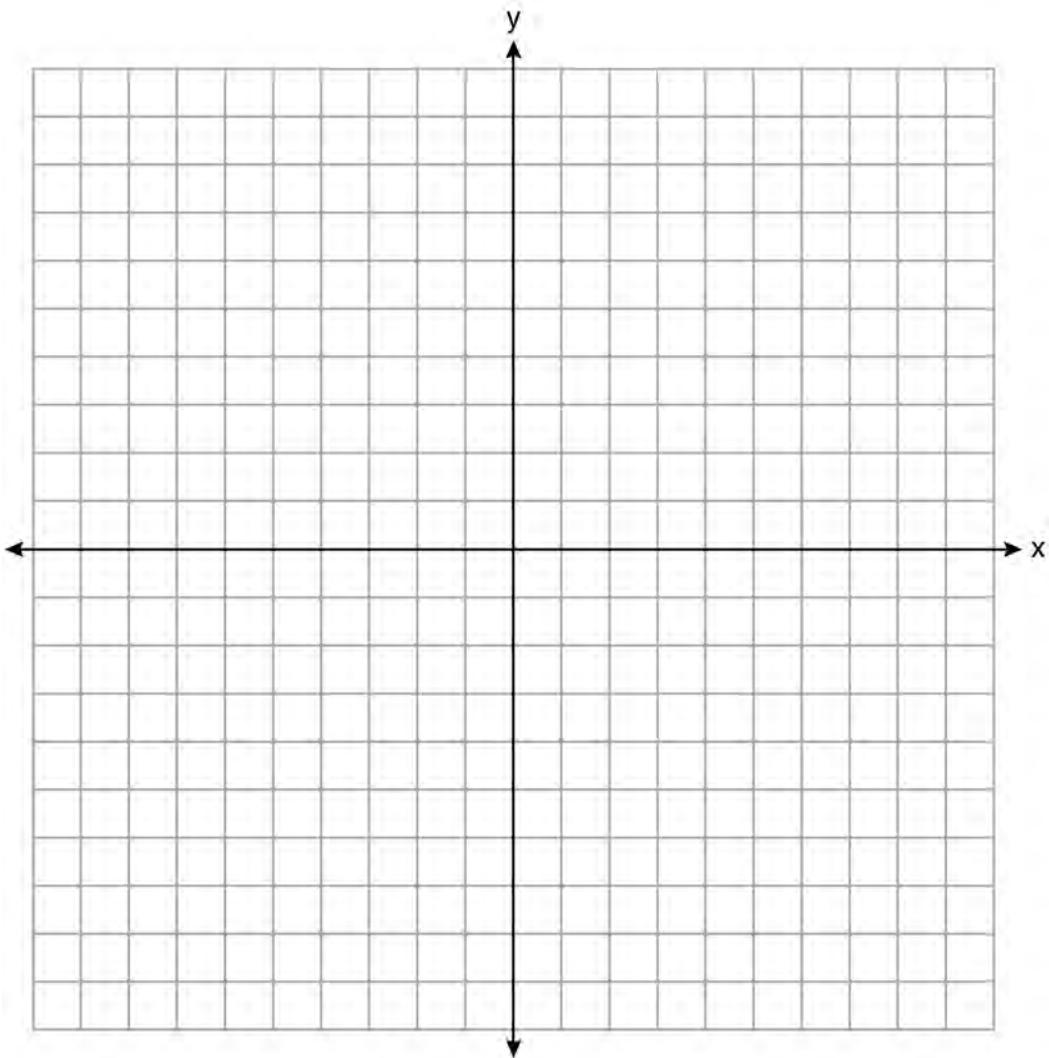
This linear equation contains the point $(2,k)$. State the value of k.

$2y = -3x - 2$
$2 \cdot K = -3 \cdot 2 - 2$

$2K = -6 - 2$
$2K = -8$
$K = -4$

Score 1: The student did not graph the equation.

27 On the set of axes below, graph the line whose equation is $2y = -3x - 2$.

$$\frac{2y}{2} = \frac{-3x}{2} - \frac{2}{2}$$

$$y = -1.5x - 1$$

x	y
-6	8
-4	5
-2	2
0	-1
2	-4
4	-7
6	-10
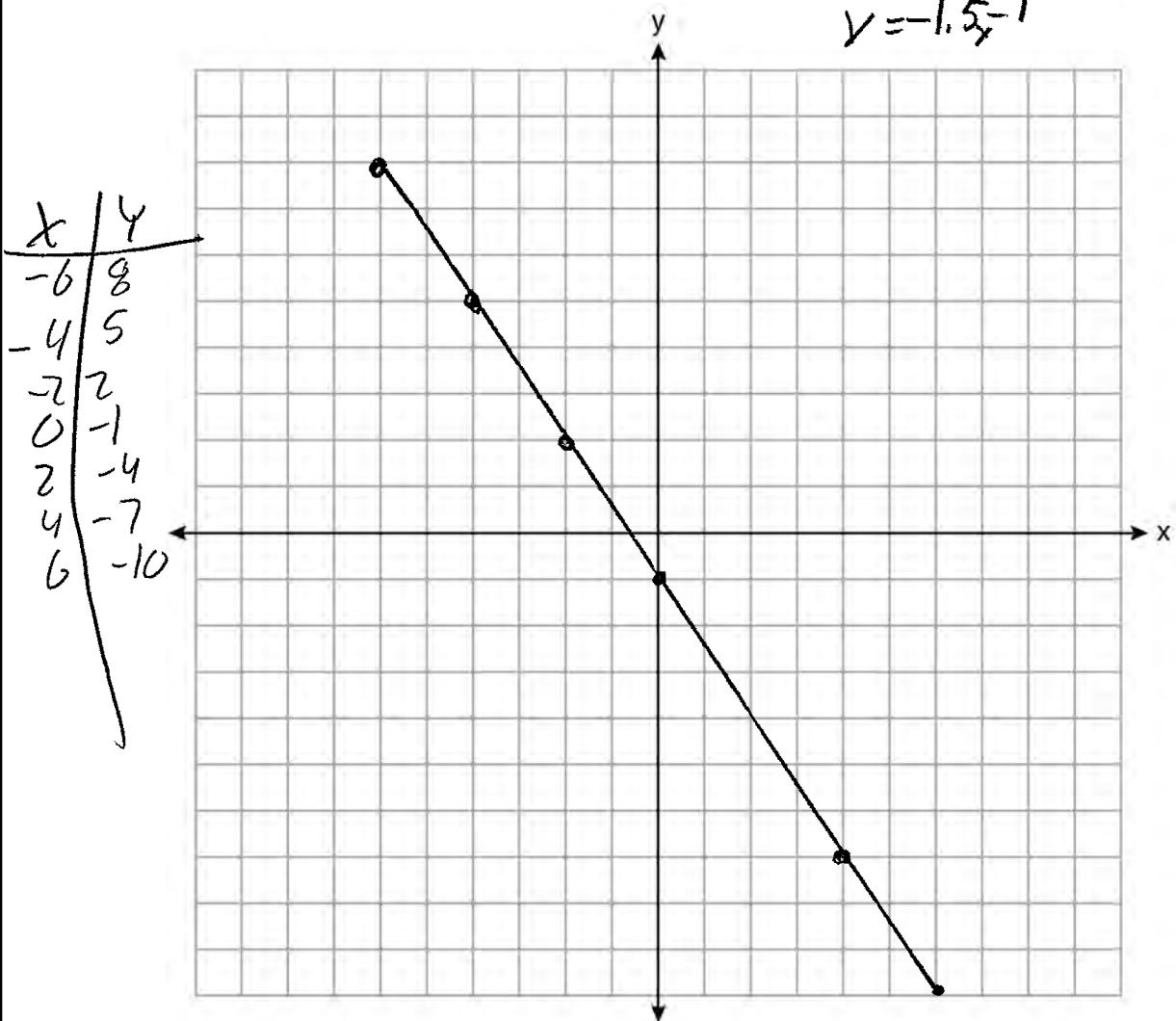
This linear equation contains the point $(2,k)$. State the value of k.

$$k = -4$$

Score 1: The student made a graphing error by not having an arrow at the end or using the full display of the given set of axes.

27 On the set of axes below, graph the line whose equation is $2y = -3x - 2$.

$$\frac{-3x}{2} \quad \frac{-2}{2}$$
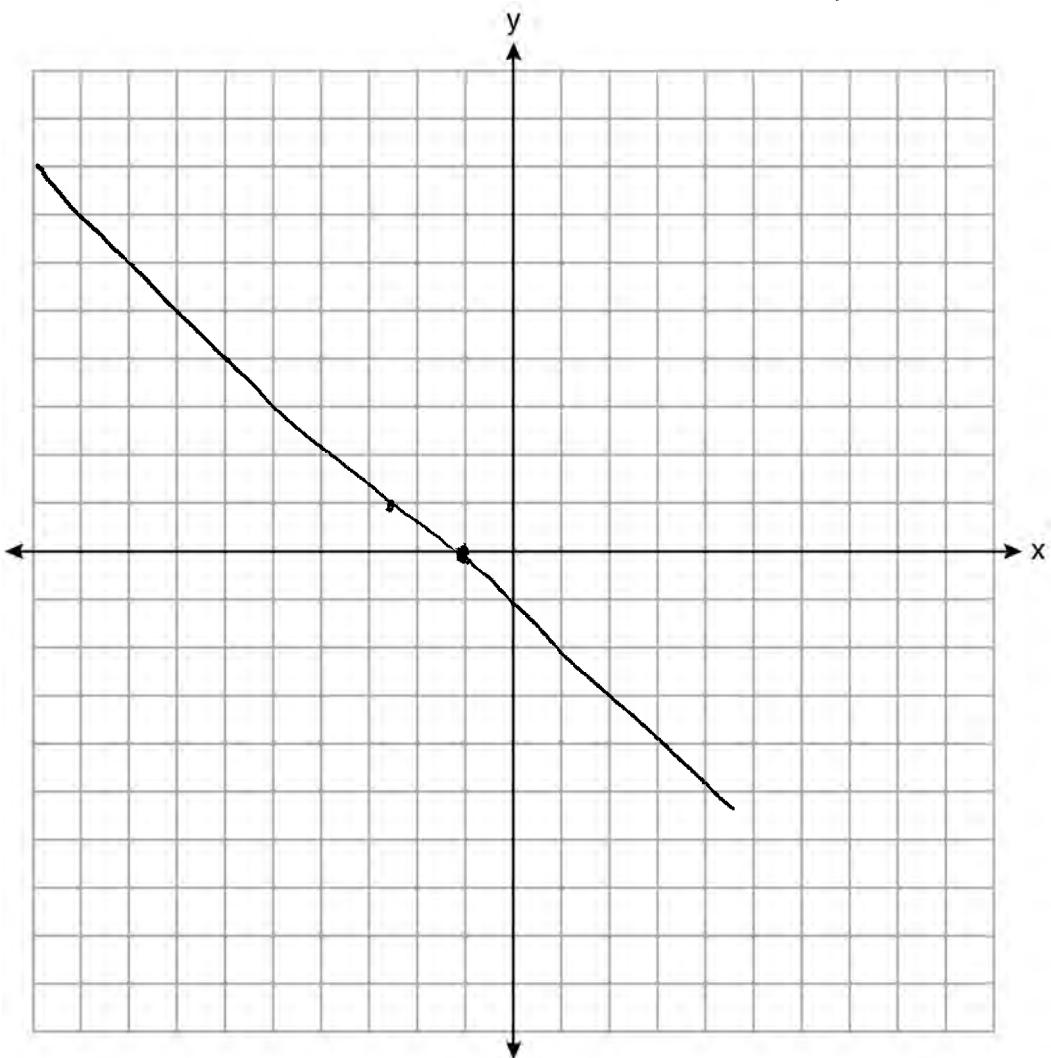
This linear equation contains the point $(2,k)$. State the value of k.

-4

Score 0: The student graphed the line incorrectly and showed no work to find -4.

28 The formula $a = \dfrac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, v_f, in terms of initial velocity, v_i, acceleration, a, and time, t.

$$t\,(a) = \left(\frac{v_f - v_i}{t}\right) t$$

$$at = v_f - v_i$$

$$+v_i \qquad +v_i$$

$$at + v_i = v_f$$

$$\boxed{v_f = at + v_i}$$

Score 2: The student gave a complete and correct response.

28 The formula $a = \dfrac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, v_f, in terms of initial velocity, v_i, acceleration, a, and time, t.

$$(t) \quad a = \frac{V_f - V_i}{t} \quad (t)$$

$$ta = V_f - V_i$$
$$+V_i \qquad +V_i$$

$$\boxed{V_f = ta + V_i}$$

$$(t) \quad a = \frac{V_f - V_i}{t} \quad (t)$$

$$ta = V_f - V_i$$
$$-V_f \quad -V_f$$

$$\frac{ta - V_f}{-1} = \frac{-V_i}{-1}$$

$$-ta + V_f = V_i$$

$$V_i = V_f - ta$$

$$a = \frac{V_f - V_i}{t}$$

$$(t) \quad a = \frac{V_f - V_i}{t} \quad (t)$$

$$\frac{ta}{a} = \frac{V_f - V_i}{a}$$

$$t = \frac{V_f - V_i}{a}$$

Score 2: The student gave a complete and correct response.

28 The formula $a = \dfrac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, v_f, in terms of initial velocity, v_i, acceleration, a, and time, t.

$$a = \frac{v_f - v_i}{t}$$

$$t \cdot a = \frac{v_f - v_i}{t} \cdot t$$

$$\frac{t \cdot a}{a} = \frac{v_f - v_i}{a}$$

$$t = \frac{v_f - v_i}{a}$$

Score 1:   The student solved the equation for t instead of v_f.

28 The formula $a = \dfrac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, v_f, in terms of initial velocity, v_i, acceleration, a, and time, t.

$$a = \frac{v_f - v_i}{t}$$
$$-t \qquad \quad t$$
$$\qquad \qquad -t$$

$$\frac{a - t}{v_i} = \frac{v_f - v_i}{v_i}$$

$$\boxed{\frac{a - t}{v_i} = v_f}$$

Score 0: The student made more than one error.

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for x.

$$\frac{1}{3} < \frac{1}{5}x - \frac{1}{3}$$

$$\frac{2}{3} < \frac{1}{5}x$$

$$\boxed{\frac{10}{3} < x}$$

Score 2: The student gave a complete and correct response.

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for x.

$15\left(\frac{3}{5}x + \frac{1}{3}\right) < \left(\frac{4}{5}x - \frac{1}{3}\right)15$

$\frac{15}{1} \times \frac{3}{5} = \frac{45}{5}$

$\frac{15}{1} \times \frac{1}{3} = \frac{15}{3}$

$\frac{15}{1} \times \frac{4}{5} = \frac{60}{5}$

$9x + 5 < 12x - 5$

$+5 \qquad +5$

$9x + 10 < 12x$

$-9x \qquad -9x$

$\dfrac{10 < 3x}{3 \quad 3}$

$\boxed{3\frac{1}{3} < x \quad or \quad \frac{10}{3} < x}$

Score 2:   The student gave a complete and correct response.

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for x.

$$\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$$

$$= \frac{1}{8}$$

$$\frac{3}{5}x < \frac{4}{5}x - \frac{2}{3}$$

$$-\frac{4}{5}x \qquad -\frac{4}{5}x$$

$$\frac{-\frac{1}{5}x}{-\frac{1}{5}} < \frac{-\frac{2}{3}}{-\frac{1}{5}}$$

$$\boxed{x < \frac{10}{3}}$$

Score 1: The student did not switch the inequality symbol when dividing by $-\frac{1}{5}$.

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for x.

$$-\frac{1}{3} \quad -\frac{1}{3}$$

$$\frac{3}{5}x < \frac{4}{5}x - \frac{1}{3} - \frac{1}{3}$$

$$\frac{3}{5}x < \frac{4}{5}x - .67$$
$$-\frac{4}{5}x \quad -\frac{4}{5}x$$

$$\frac{-.2x}{-.2} < \frac{-.67}{-.2}$$

$$\boxed{x > 3.35}$$

Score 1: The student made an error by rounding $-\frac{2}{3}$.

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for x.

$$-\frac{3}{5} + \frac{1}{3} \quad -\frac{3}{5} + \frac{1}{3}$$

$$-\frac{\frac{2}{3}}{\frac{2}{5}} < \frac{\frac{2}{5}x}{\frac{2}{5}}$$

$$\frac{1}{15} < x$$

$$\boxed{x > \frac{1}{15}}$$

Score 0: The student made more than one computational error.

30 Is the product of two irrational numbers always irrational? Justify your answer.

The product of two irrational numbers is only sometimes irrational. It is possible that two irrational #s will form a rational #

Ex $\sqrt{5} \times \sqrt{2} = \sqrt{10} = $ irrational

$\sqrt{8} \times \sqrt{2} = \sqrt{16} = (4)$ rational

Score 2: The student gave a complete and correct response.

30 Is the product of two irrational numbers always irrational? Justify your answer.

No, it's not

$\sqrt{2}$ = irrational number

$\sqrt{2} \times \sqrt{2} = \sqrt{4} = 2$

2 = rational number

Score 2: The student gave a complete and correct response.

30 Is the product of two irrational numbers always irrational? Justify your answer.

The product of two irrational numbers is sometimes irrational, because it depends on what type of irrational number.

Score 1: The student gave an incomplete justification.

30 Is the product of two irrational numbers always irrational? Justify your answer.

$$\overset{I}{\sqrt{15}} \cdot \overset{I}{\sqrt{11}} = \overset{I}{\sqrt{165}}$$

$$\overset{I}{\sqrt{2}} \cdot \overset{I}{\sqrt{3}} = \overset{I}{\sqrt{6}}$$

$$\overset{I}{\sqrt{5}} \cdot \overset{I}{\sqrt{7}} = \overset{I}{\sqrt{35}}$$

$$\overset{I}{\sqrt{6}} \cdot \overset{I}{\sqrt{13}} = \overset{I}{\sqrt{78}}$$

$$\overset{I}{\sqrt{33}} \cdot \overset{I}{\sqrt{10}} = \overset{I}{\sqrt{330}}$$

Yes, because every time I multiplied I by I, I got an I.

Score 1: The student gave an appropriate answer based upon their multiple examples.

30 Is the product of two irrational numbers always irrational? Justify your answer.

No because, if you do a negative irrational number multiplied by another negative irrational number it'll give you a positive rational number.

Ex: $-3 \times -3 = 9$

$-7 \times -7 = 49$

$-7 \times -3 = 21$

Score 0: The student gave a completely incorrect response.

31 Solve $6x^2 - 42 = 0$ for the exact values of x.

$$+42 \quad +42$$

$$\frac{6x^2}{6} = \frac{42}{6}$$

$$\sqrt{x^2} = \sqrt{7}$$

$$x = \pm\sqrt{7}$$

Score 2: The student gave a complete and correct response.

31 Solve $6x^2 - 42 = 0$ for the exact values of x.

$$6x^2 - 42 = 0$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{0 \pm \sqrt{0 - 4(6)(-42)}}{2(6)} \rightarrow \frac{0 \pm \sqrt{1008}}{12}$$

$$\frac{\sqrt{1008}}{12}$$

$$\frac{0 + \sqrt{1008}}{12} = 2.645751311$$

$$\frac{0 - \sqrt{1008}}{12} = -2.645751311$$

$$\boxed{\begin{array}{l} x = +2.645751311 \\ x = -2.645751311 \end{array}}$$

Score 1: The student expressed the answers as decimals using the full display of the calculator.

31 Solve $6x^2 - 42 = 0$ for the exact values of x.

$$6x^2 = 42$$
$$x^2 = 7$$
$$x = \pm\sqrt{7}$$
$$x = \pm 2.65$$

Score 1: The student stated $\pm\sqrt{7}$, but expressed the answer as a rounded decimal.

31 Solve $6x^2 - 42 = 0$ for the exact values of x.

$$6x^2 - 42 = 0$$

$$\frac{6x^2}{6} = \frac{42}{6}$$

$$\sqrt{x^2} = \sqrt{7}$$

$$x = \sqrt{7}$$

Score 1:   The student gave only the positive value of x.

31 Solve $6x^2 - 42 = 0$ for the exact values of x.

$$6x^2 = 42$$

$$\sqrt{x^2} = \sqrt{7}$$

$$X = 2.6$$

Score 0: The student only stated one solution and expressed the answer as a rounded decimal.

31 Solve $6x^2 - 42 = 0$ for the exact values of x.

$$6x^2 - 42 = 0$$
$$+42$$

$$\sqrt{6x^2} = \sqrt{42}$$

$$\frac{2.45x}{2.45} = \frac{6.48}{2.45}$$

$$\boxed{x = 2.644\ 897\ 959}$$

Score 0: The student made multiple errors.
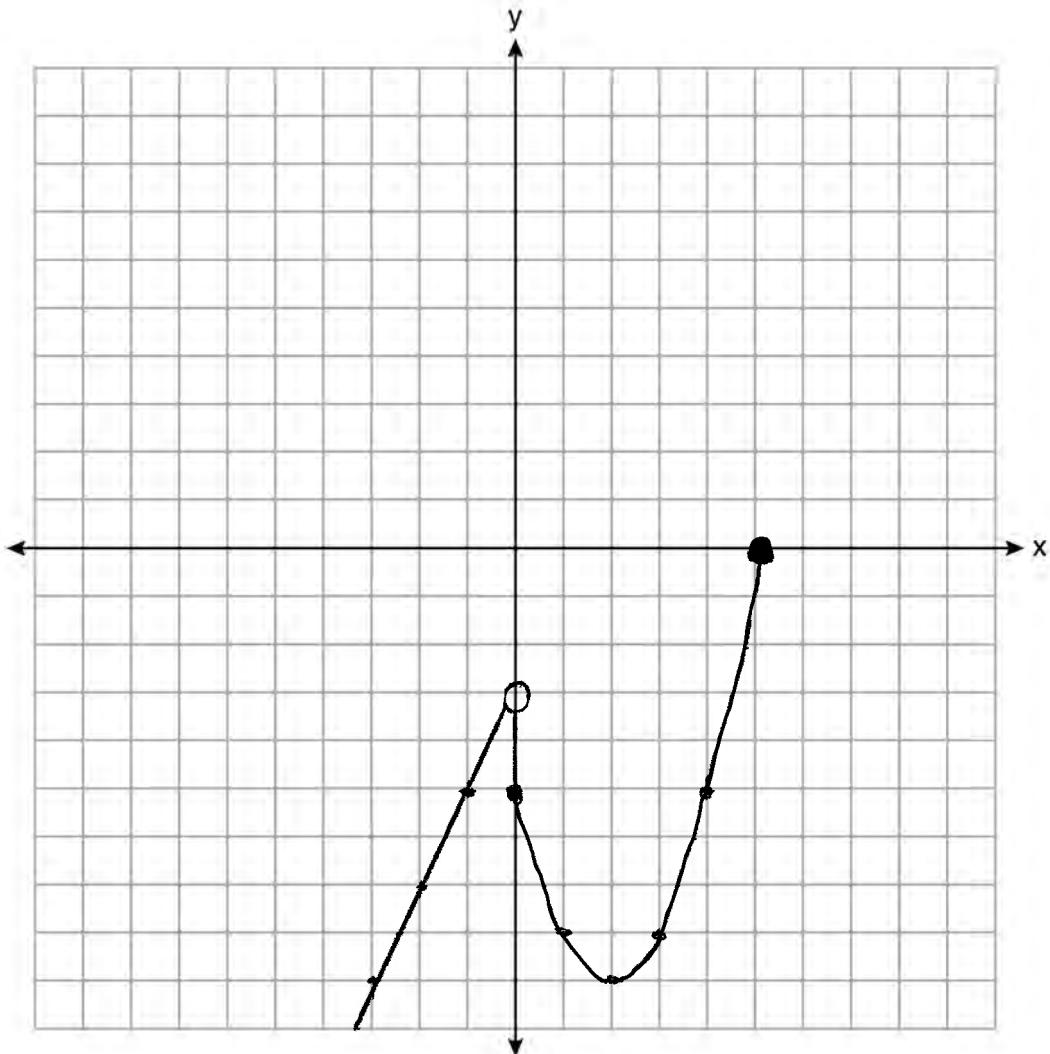
32 Graph the function: $h(x) = \begin{cases} 2x - 3, & x < 0 \\ x^2 - 4x - 5, & 0 \le x \le 5 \end{cases}$

Score 2: The student gave a complete and correct response.

32 Graph the function: $h(x) = \begin{cases} 2x - 3, & x < 0 \\ x^2 - 4x - 5, & 0 \le x \le 5 \end{cases}$
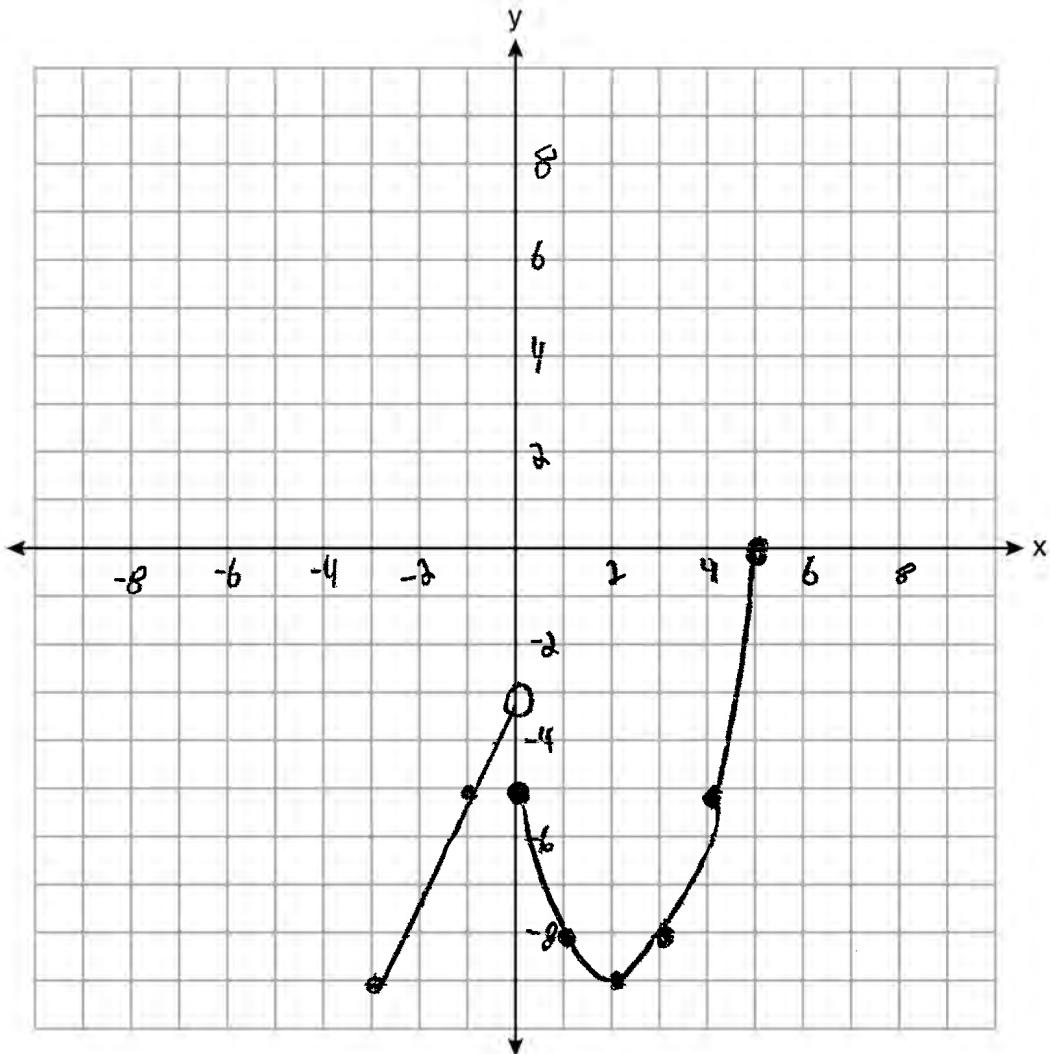
Score 1: The student graphed $h(x) = 2x - 3$ over the interval $-3 \le x < 0$.

32 Graph the function: $h(x) = \begin{cases} 2x-3, & x<0 \\ x^2-4x-5, & 0 \le x \le 5 \end{cases}$
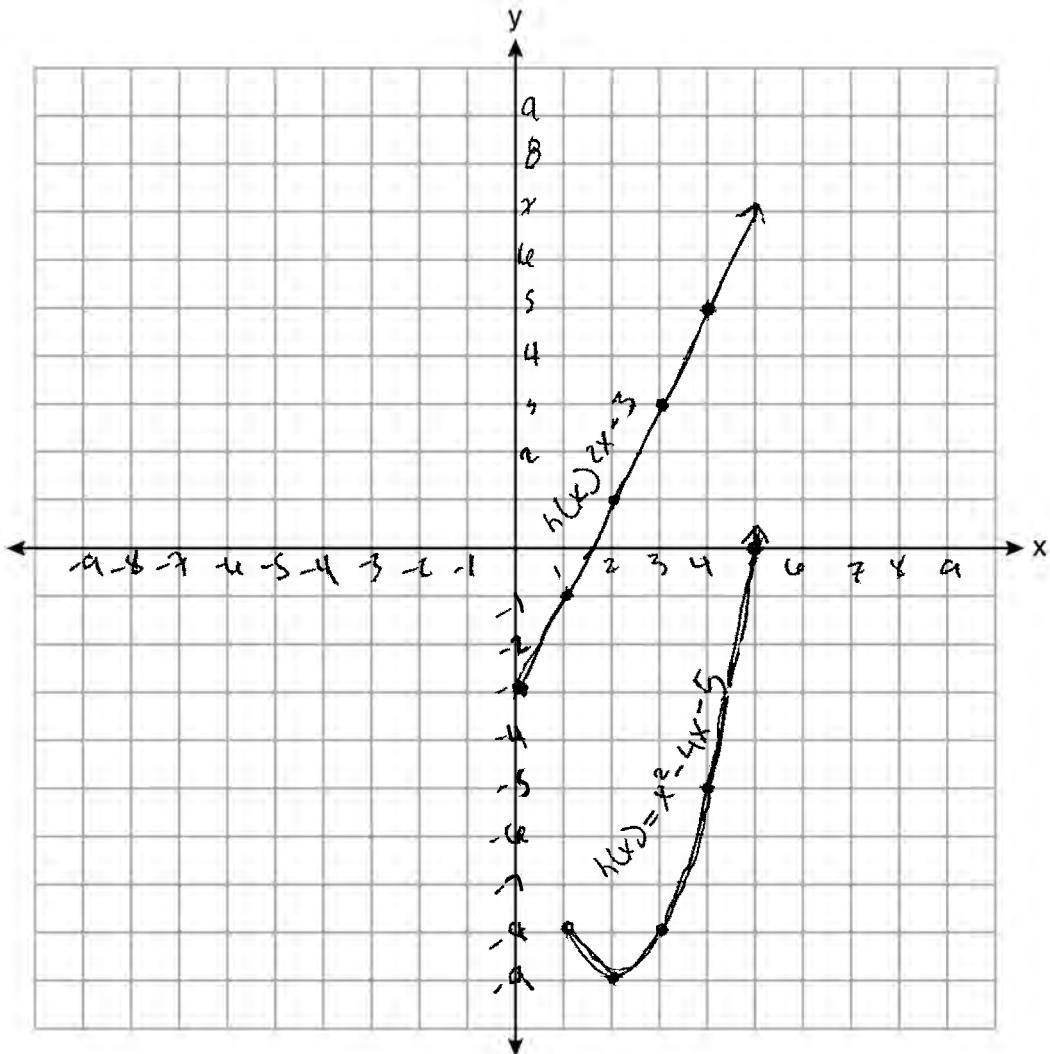
**Score 0:** The student graphed $h(x) = 2x - 3$ for $x \ge 0$ and $h(x) = x^2 - 4x - 5$ for $x \ge 1$.

33 On the set of axes below, graph the following system of inequalities:

$$2x + y \geq 8$$
$$-2x \qquad -2x$$
$$y \geq -2x + 8$$

$$2x + y \geq 8$$
$$y - 5 < 3x$$

$$y \quad \begin{array}{c} -5 < 3x \\ +5 \quad +5 \end{array}$$
$$y < 3x + 5$$
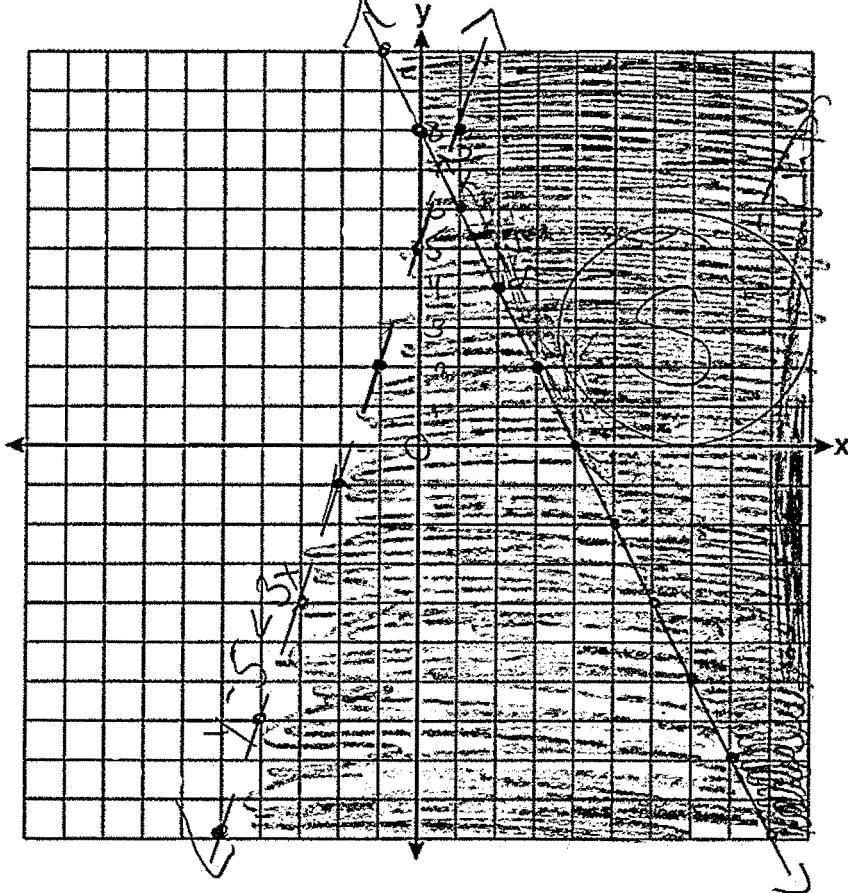
Determine if the point (1,8) is in the solution set. Explain your answer.

It is not a point in the solution set because it only fits one inequality. The point (1,8) does not fit on the second inequality because it is on the dotted line that does **not** include the point as a solution.

Score 4: The student gave a complete and correct response.

33 On the set of axes below, graph the following system of inequalities:

$y \geq -2x + 8$

$y < 3x + 5$

$$-\frac{2}{2}x + y \geq 8$$
$$y - 5 < 3x$$

$+5$
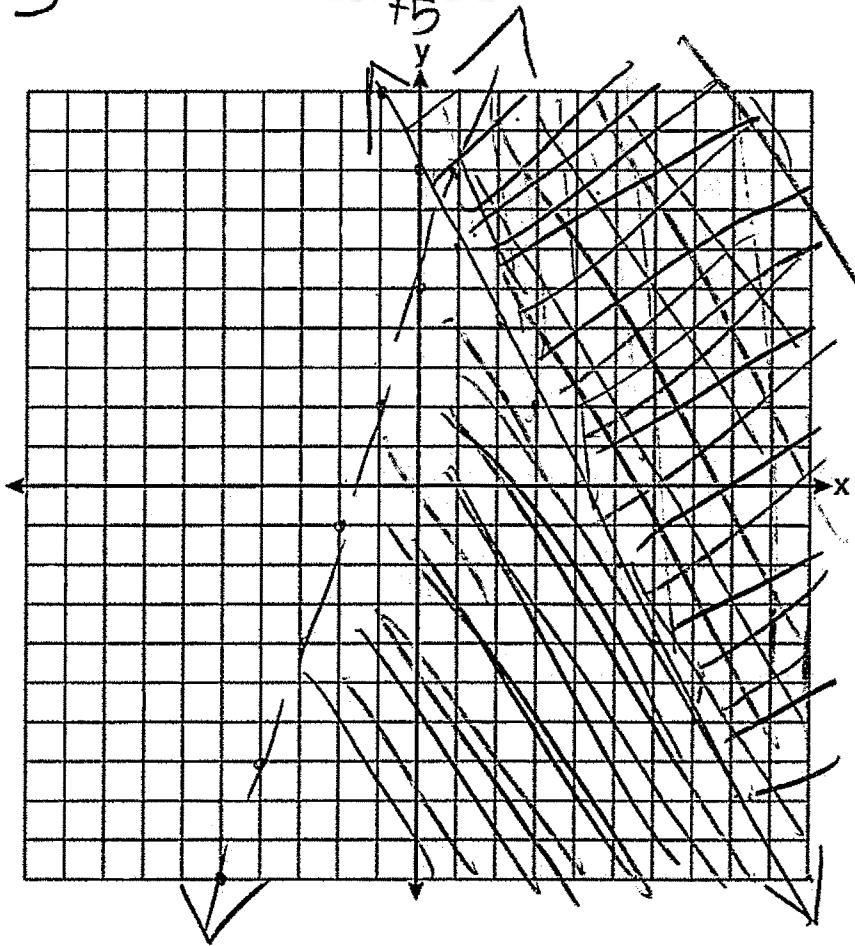
Determine if the point (1,8) is in the solution set. Explain your answer.

No, because it lies on a less than line. Less than lines do not include the points on said line

Score 3: The student did not label either inequality on the graph.

33 On the set of axes below, graph the following system of inequalities:

$$2x + y \geq 8$$
$$y - 5 < 3x$$

$$y - 5 < 3x$$

Determine if the point (1,8) is in the solution set. Explain your answer.

$$2 + 8 \geq 8 \qquad 8 - 5 < 3(1)$$
$$10 \geq 8 \checkmark \qquad 3 < 3$$
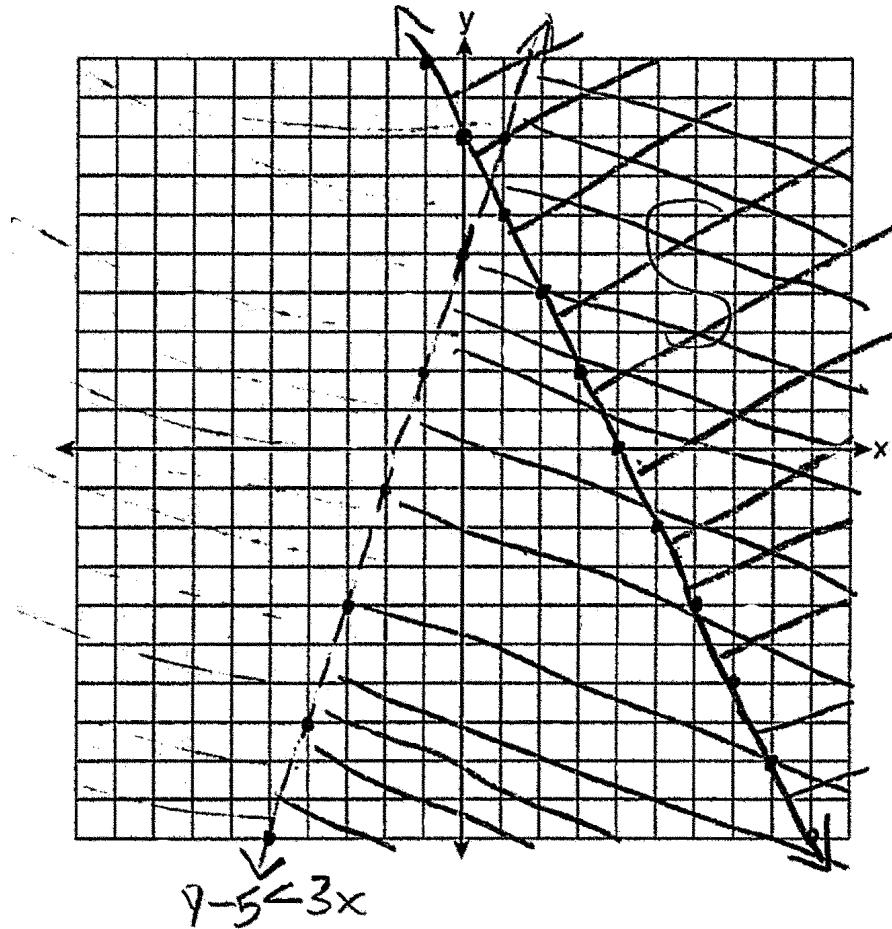
No

Score 3: The student gave a justification, not an explanation.

33 On the set of axes below, graph the following system of inequalities:

$$2x + y \geq 8$$
$$y - 5 < 3x$$

$2x + y \geq 8$
$-2x \qquad -2x$
_____
$y \geq -2x + 8$

$y - 5 < 3x$
$+5 \qquad +5$
_____
$y < 3x + 5$
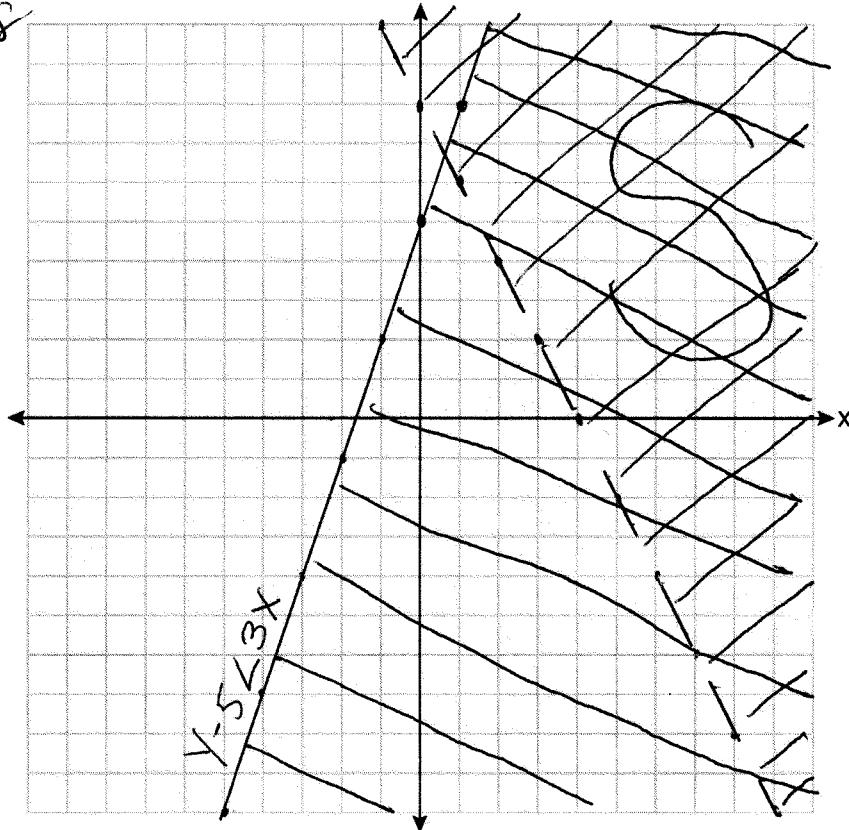
Determine if the point (1,8) is in the solution set. Explain your answer.

Yes, (1,8) lies on the solid line and is in the solution set "S"

Score 3: The student made a graphing error by switching solid and dashed lines, but gave an appropriate explanation.

33 On the set of axes below, graph the following system of inequalities:
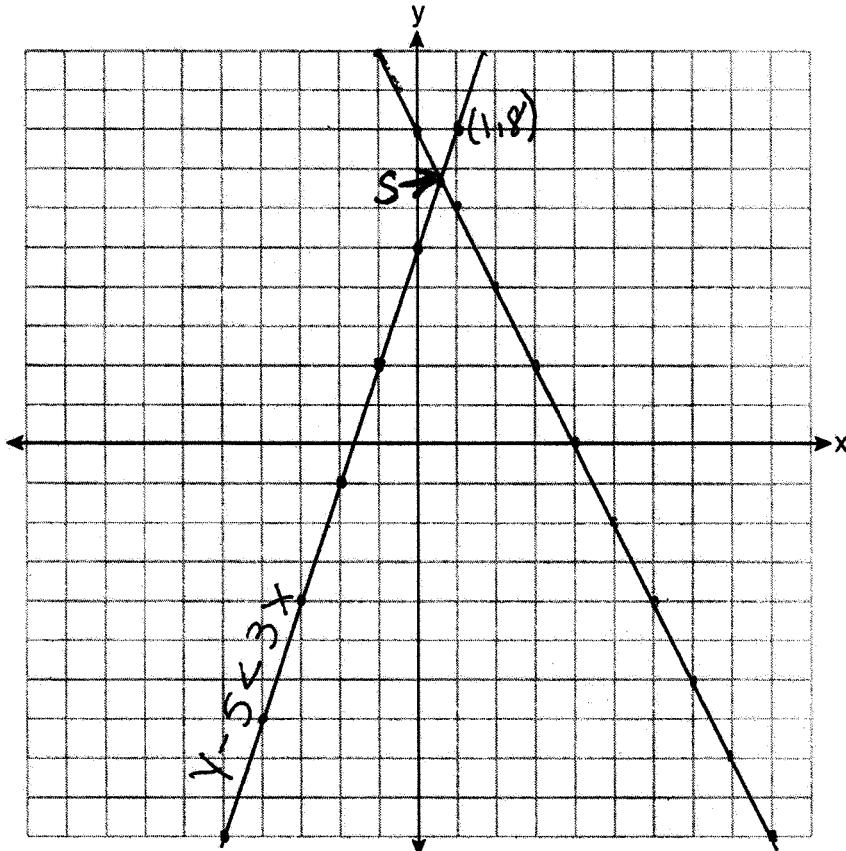
$$2x + y \geq 8$$
$$y - 5 < 3x$$

Determine if the point (1,8) is in the solution set. Explain your answer.

(1,8) is not a solution because the lines do not cross at (1,8) on the graph.

Score 3: The student graphed $2x + y = 8$ and $y - 5 = 3x$ correctly and gave an appropriate determination and explanation.

33 On the set of axes below, graph the following system of inequalities:

$$2x + y \geq 8$$
$$y - 5 < 3x$$

$y - 5 < 3x$
$\underline{+5 \quad\quad +5}$
$y < 3x + 5$

$y < 3x+5$

X	Y
-3	-4
-2	-1
-1	2
0	5
1	8
2	11
3	14

$y<3x+5$
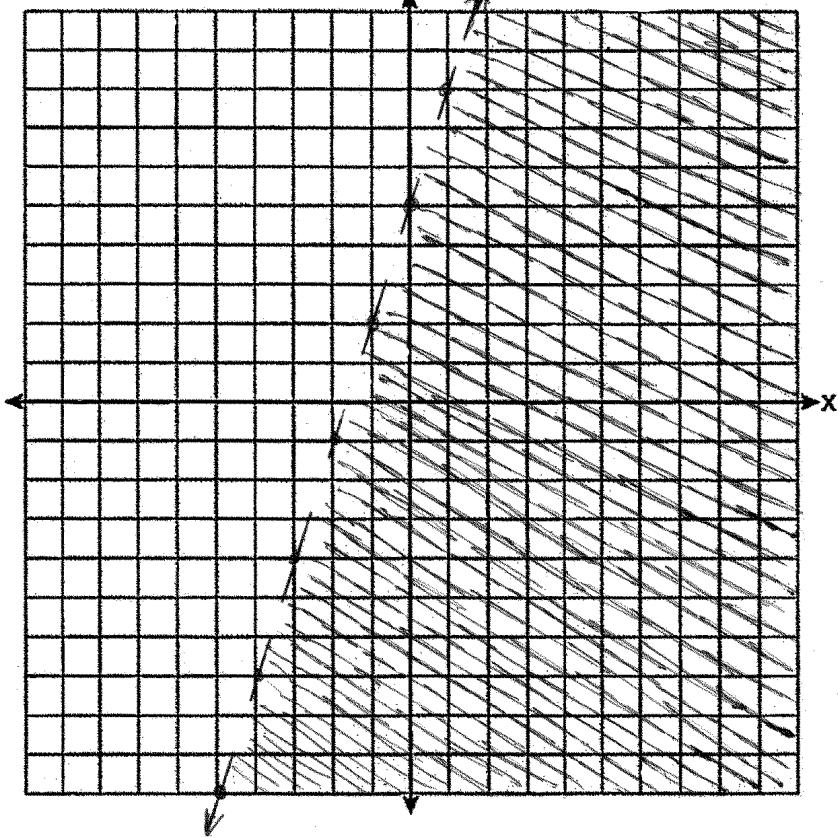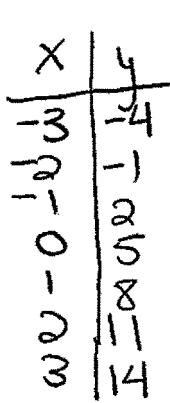
Determine if the point (1,8) is in the solution set. Explain your answer.

No, the point (1,8) is exactly on the line.

Score 2: The student graphed $y - 5 < 3x$ correctly, but wrote an incomplete explanation.

33 On the set of axes below, graph the following system of inequalities:

$2x + y \geq 8$
$-2x \quad -2x$
$y - 5 < 3x$
$+5 \quad +5$

$y \geq 8 - 2x$ (2)

$y < 5 + 3x$ (1)
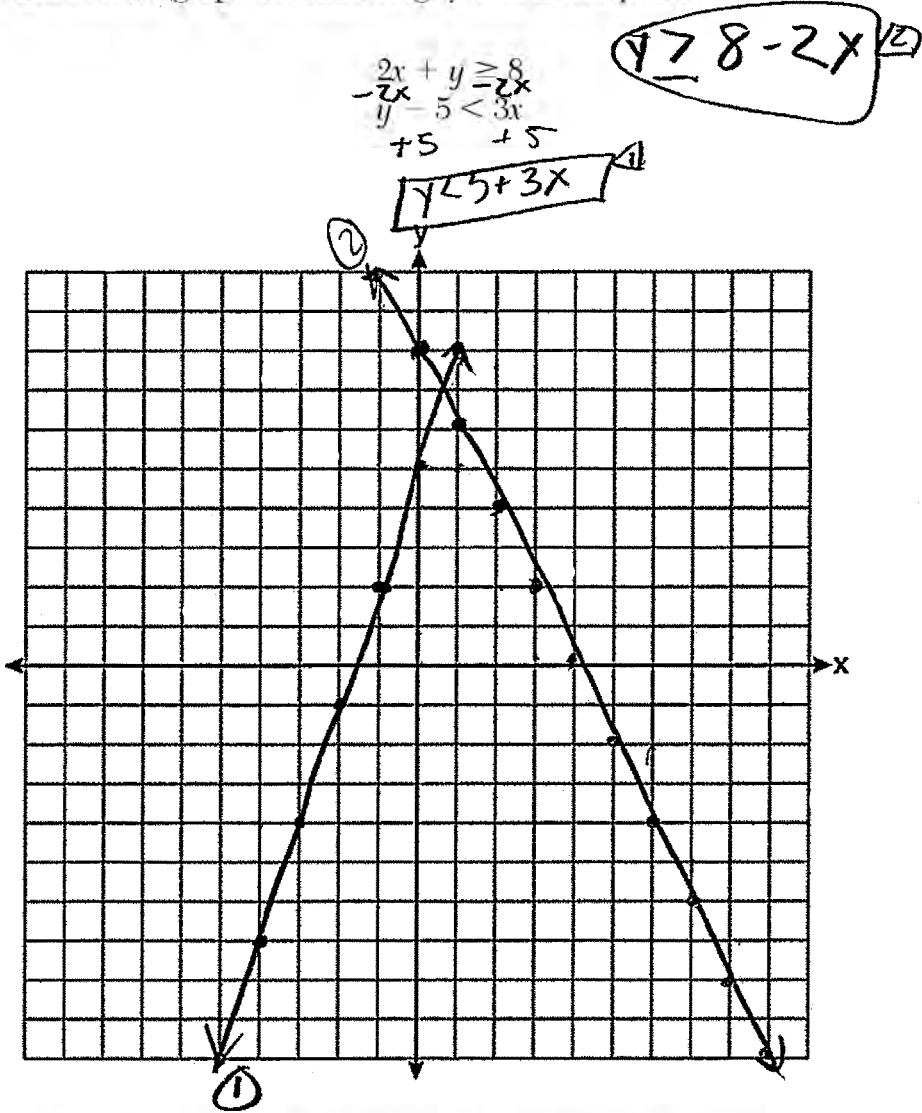
Determine if the point (1,8) is in the solution set. Explain your answer.

(1,8) Isn't in the Solution Set.

Score 1: The student graphed $2x + y = 8$ and $y - 5 = 3x$ correctly, but did not write an explanation.

33 On the set of axes below, graph the following system of inequalities:

$$\frac{-3x + y \geq \frac{8}{2x}}{y - 5 < 3x}$$
$$+5 \quad +5$$

$y \leq 4x$

$y \leq 3x + 5$

$y \leq 4x$

$y < 3x + 5$

$y < 3x + 5$

$y < 3x + 5$

X	Y
-3	-4
-2	-1
-1	2
0	5
1	8
2	11
3	14

X	Y
-2	-8
-1	-4
0	0
1	4
2	8
3	12
4	16

$y \leq 4x$
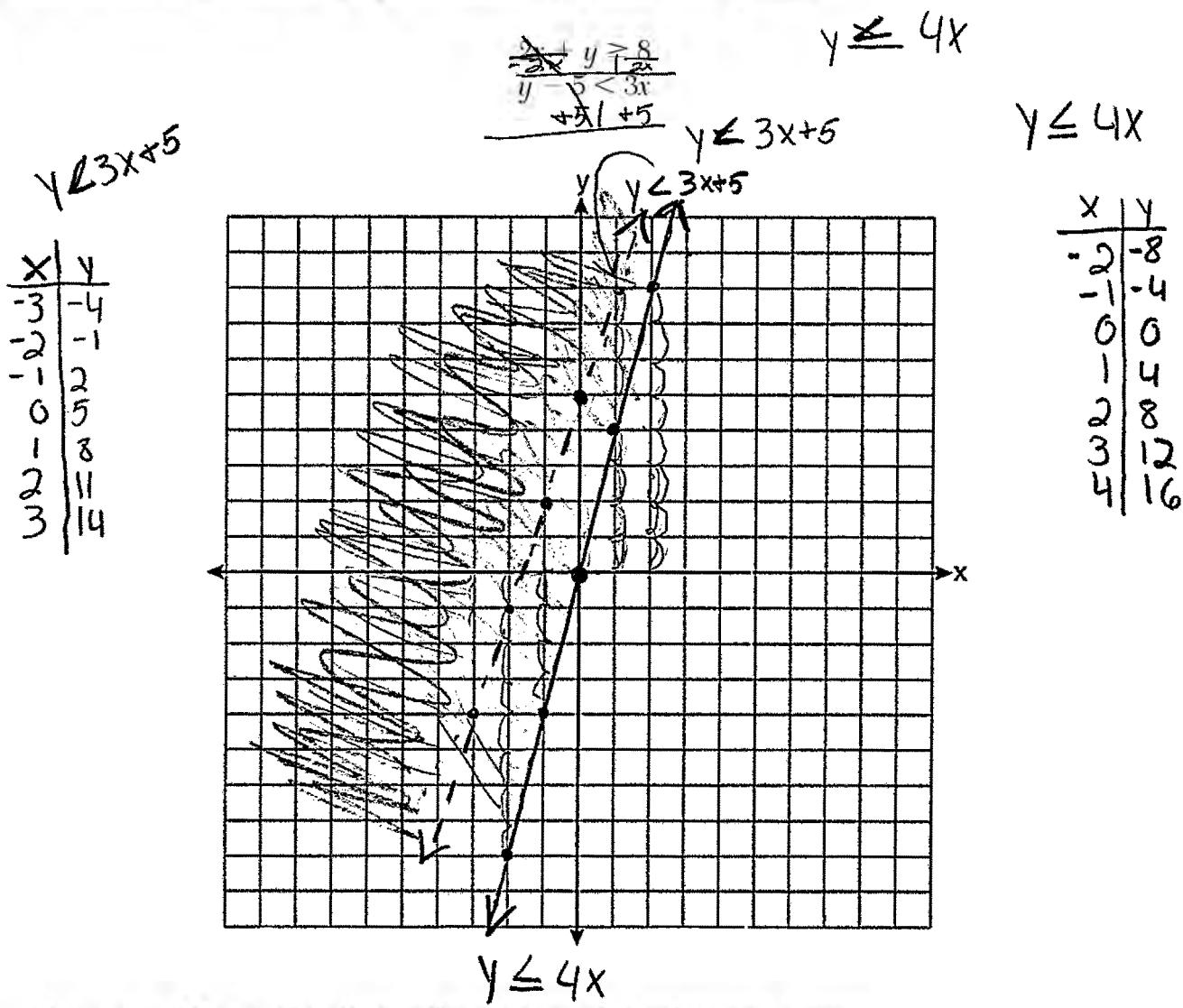
Determine if the point (1,8) is in the solution set. Explain your answer.

Yes. The Point (1,8) is in the Shades area

**Score 0:** The student did not show enough correct work to receive any credit.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

$$A(t) = 5000(1 + 0.012)^t$$

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$5000(1.012)^{32} - 5000(1.012)^{17}$$
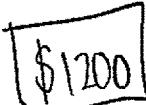
$$\boxed{\$1200}$$

Score 4: The student gave a complete and correct response.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

$$A(t) = 5000(1 + .012)^t$$

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$17 : 5000(1 + .012)^{17} = 6124$$

$$32 : 5000(1 + .012)^{32} = 7324$$

At 32 years old he will be $1200 dollars more than when he would be 17.

Score 4: The student gave a complete and correct response.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

$$A(t) = 5000(1 + .012)^t$$

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$A(t) = 5000(1 + .012)^{17}$$

$$A(t) = 5000(1 + .012)^{32}$$

17 years = $6124.05

32 years = $7323.97

At the age of 32, Alexander will have $1199.92 more then when he was 17.

Score 3: The student did not express their answer to the nearest dollar.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$5000(1+0.012)^t$$

17yrs = 6124
32yrs = 7324

$\begin{array}{r} 7324 \\ -6124 \\ \hline \end{array}$

$1200 More

Score 3: The student wrote an expression and used it to determine the correct difference.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

$$A(t) = 5000(1 + .012)^t$$

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$A(t) = 5000(1 + .012)^t$$
$$A(t) = 5000(1 + .012)^{15}$$
$$A(t) = 5979.67$$
$$\text{or}$$
$$5979.68$$

$\begin{array}{r} {}^{2}\!\!\not{3}{}^{12}\!\!\not{2} \\ -1\ 7 \\ \hline 1\ 5 \end{array}$

Score 2: The student wrote a correct function, but no further correct work was shown.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

$$A(t) = 1.2t + \$5000$$

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$A(t) \; 1.2(32) + 5000 = \$5,038$$

$$A(t) = 1.2(17) + 5000 = 5020$$

Score 1: The student used an incorrect function to find the value at 32 and 17 years, but did not find the difference.

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment t years after Alexander's birth.

$$5000 + 1.2t$$

Determine, to the *nearest dollar*, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

Score 0: The student did not show any correct work.

35 Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

Distance From Times Square (city blocks) (x)	0	0	1	1	3	4	7	11	14	19
Cost of a Room (dollars) (y)	293	263	244	224	185	170	219	153	136	111

Write the linear regression equation for this data set. Round all values to the *nearest hundredth*.

$$y = -7.76x + 246.34$$

State the correlation coefficient for this data set, to the *nearest hundredth*.

$$r = -0.88$$

Explain what the sign of the correlation coefficient suggests in the context of the problem.

The negative sign suggests a negative correlation. As the distance from Times Square increases, the cost of a room decreases.

Score 4: The student gave a complete and correct response.

35 Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

Distance From Times Square (city blocks) (x)	0	0	1	1	3	4	7	11	14	19
Cost of a Room (dollars) (y)	293	263	244	224	185	170	219	153	136	111

Write the linear regression equation for this data set. Round all values to the *nearest hundredth*.

$$y = -7.76x + 246.34$$

State the correlation coefficient for this data set, to the *nearest hundredth*.

$$r = -.88$$

Explain what the sign of the correlation coefficient suggests in the context of the problem.

The sign of correlation suggests the strength of the like and if its positive or negative.
This has a negative and strong fit

Score 3: The student did not explain the sign in the context of the problem.

35 Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

Distance From Times Square (city blocks) (x)	0	0	1	1	3	4	7	11	14	19
Cost of a Room (dollars) (y)	293	263	244	224	185	170	219	153	136	111

Write the linear regression equation for this data set. Round all values to the *nearest hundredth*.

$$y = ax + b$$
$$a = -7.76$$
$$b = 246.34$$

State the correlation coefficient for this data set, to the *nearest hundredth*.

Explain what the sign of the correlation coefficient suggests in the context of the problem.

Score 2: The student wrote the linear regression formula and gave correct values for *a* and *b*.

35 Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

Distance From Times Square (city blocks) (x)	0	0	1	1	3	4	7	11	14	19
Cost of a Room (dollars) (y)	293	263	244	224	185	170	219	153	136	111

a x + b

Write the linear regression equation for this data set. Round all values to the *nearest hundredth*.

$$a x + b$$
$$-7.76(x) + 246.34$$
$$r = -.88$$

State the correlation coefficient for this data set, to the *nearest hundredth*.

Explain what the sign of the correlation coefficient suggests in the context of the problem.

Score 2: The student wrote a correct expression and correlation coefficient.

35 Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

Distance From Times Square (city blocks) (x)	0	0	1	1	3	4	7	11	14	19
Cost of a Room (dollars) (y)	293	263	244	224	185	170	219	153	136	111

Write the linear regression equation for this data set. Round all values to the *nearest hundredth*.

$$y = ax + b$$
$$a = -9.5076\ldots$$
$$a \approx -9.51$$
$$b = 243.04568\ldots$$
$$b \approx 243.05$$

State the correlation coefficient for this data set, to the *nearest hundredth*.

$$r = -.764747\ldots$$
$$r \approx -.76$$

Explain what the sign of the correlation coefficient suggests in the context of the problem.

The negative sign of the correlation coefficient suggests that the cost of a hotel room goes down the farther it is away from Times Square.

Score 1: The student wrote a correct explanation based on their correlation coefficient.

35 Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

Distance From Times Square (city blocks) (x)	0	0	1	1	3	4	7	11	14	19
Cost of a Room (dollars) (y)	293	263	244	224	185	170	219	153	136	111

Write the linear regression equation for this data set. Round all values to the *nearest hundredth*.

$\leftarrow$ 88

State the correlation coefficient for this data set, to the *nearest hundredth*.

−7.76

Explain what the sign of the correlation coefficient suggests in the context of the problem.

Idk

**Score 0:** The student gave a completely incorrect response.

36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Determine the average rate of snowfall over the length of the storm. State the rate, to the *nearest hundredth of an inch per hour.*

$$\frac{10 \text{ inches}}{17 \text{ hours}} = .5882352941$$

The average was .59

**Score 4:** The student gave a complete and correct response.

36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Elapsed Time (in hours)

Determine the average rate of snowfall over the length of the storm. State the rate, to the *nearest hundredth of an inch per hour.*   the   averge rate of snow full
.60 of an inch per hour
I flug the info im my calk. and got this for the rate

**Score 3:**   The student stated an incorrect average rate of snowfall.

36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Determine the average rate of snowfall over the length of the storm. State the rate, to the *nearest hundredth of an inch per hour.*

Score 2: The student did not connect the points on the graph and did not state an average rate of snowfall.

36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

2"   4 hr

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

6"   6 hr

Then it stopped snowing for 3 hours.

0"   3 hr

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

2"   4 hr

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

total 10"   17 hr.

$\frac{10}{17} = .59$
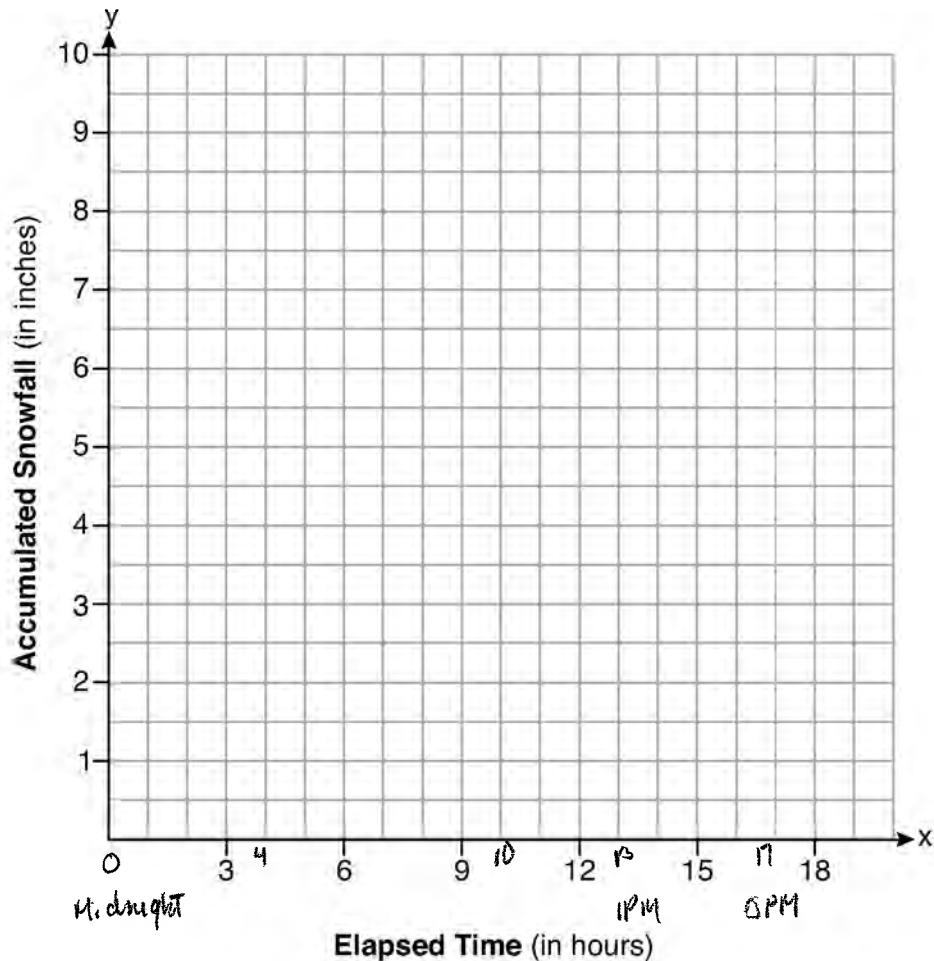
Determine the average rate of snowfall over the length of the storm. State the rate, to the *nearest hundredth of an inch per hour.*


Score 1: The student stated a correct rate of change.

36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Elapsed Time (in hours)

Determine the average rate of snowfall over the length of the storm. State the rate, to the *nearest hundredth of an inch per hour.*

$$\frac{1 \, hour}{.5 \, inch} = 2 \, inches \, per \, hr.$$

Score 0:   The student showed no correct work.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$3.75A + 2.50D = 35$$
$$A + D = 12$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$A + D = 12$$
$$\underline{-D\ -D}$$
$$A = 12 - D$$

$$A + D = 12$$
$$A + 8 = 12$$
$$\underline{-8\ -8}$$
$$A = 4$$

$$3.75A + 2.50D = 35$$
$$3.75(12 - D) + 2.50D = 35$$
$$45 - 3.75D + 2.50D = 35$$
$$45 - 1.25D = 35$$
$$\underline{-45\qquad\quad -45}$$
$$\frac{-1.25D = -10}{-1.25\quad -1.25}$$
$$D = 8$$

4 Americanas
8 Delaware

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

each day for Americano
$4 \times 2 = 8$ $8 \times 7 = 56$
$8 \times 1 = 8$ $56 \times 2 = 112$
each day for delaware   eggs each week

$$\frac{112}{12} = 9.\overline{33}$$

$$9 \times 2.50 = 22.5$$

$22.50

Score 6: The student gave a complete and correct response.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$3.75A + 2.50D = 35$$

$$A + D = 12$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$? + ? = 12$$

4 - american
   ducklinn

8 ddaware
   chicken

7	5
10	2
6	6
4	8

$$3.75(7) + 2.50(5) > 35$$
$$3.75(5) + 2.50(7) > 35$$
$$3.75(6) + 2.50(6) > 35$$
$$3.75(10) + 2.50(2) > 35$$
$$3.75(2) + 2.50(10) < 35$$
$$3.75(4) + 2.50(8) = 35$$

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

American $-2 \times 4 \times 7 = 56$ eggs a week

Delaware $-1 \times 8 \times 7 = 56$ eggs a week

$$56 + 56 = 112 \qquad 112 \div 12 = 9.\overline{3}$$

$$\$22.50 \text{ dollars a week}$$

Score 5: The student used a method other than algebraic to determine $A = 4$ and $D = 8$.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$35 = 3.75A + 2.50D$$
$$12 = A + D$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$35 = 3.75A + 2.50D$$
$$2.50 (12 = A + D)$$

$$3.75A + 2.50D = 35$$
$$-2.50A + 2.50D = 30$$

$$\frac{1.25A}{1.25} = \frac{5}{1.25}$$

$$\boxed{A = 4}$$

Allysa bought 4 Americana chickens, and 8 Delaware chickens.

$$12 = A + D$$
$$12 = 4 + D$$
$$\boxed{8 = D}$$

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

Americana
$$4(2) = 8 \text{ eggs a day}$$
Delaware
$$8(1) = 8 \text{ eggs a day}$$
$$16 \text{ eggs a day}$$
$$7(16) = 112 \text{ eggs / week}$$

9.33 dozens a week
$$9.33 (2.50)$$
$$\boxed{\$23.33 \text{ per week}}$$

Score 5: The student found revenue for $9\frac{1}{3}$ dozen eggs instead of 9 dozen.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$A + D = 12$$
$$3.75A + 2.50D = 35$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$\frac{3.75A + 2.50D}{3.75} = \frac{35 - 2.50D}{3.75}$$

$$-2.50D$$

$$\begin{array}{c} 9.30 \\ 2.50 \quad 6.80 \end{array}$$

$$375(7) + 250D = 35$$
$$26.25 \qquad \begin{array}{r} -26.25 \\ \hline 8.75 \\ \downarrow \\ 8 \end{array}$$

$$A = 7$$
$$D = 8$$

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

$$7(2) = 14 \times 7 = 98$$
$$8(1) = 8 \times 7 = 56$$

$$^{154}/_{12} = 12.8\overline{3} \qquad 12 \times 2.50 = \boxed{30}$$

Score 4: The student wrote a correct system of equations and stated values for $A = 7$ and $D = 8$, which they used to determine an appropriate amount of money.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$3.75A + 2.50D = 35$$

$$A + D = 12$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$A = 4, \quad D = 8$$

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

Score 3:   The student wrote a correct system of equations and stated $A = 4$ and $D = 8$.

37 Allysa spent \$35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost \$3.75 each and Delaware chickens cost \$2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$3.75A + 2.50D = 35$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$3.75(4) + 2.50(8) = 35$$
$$15 + 20 = 35$$
$$35 = 35 \checkmark$$

A	D
~~6~~	~~6~~
~~5~~	~~7~~
④	⑧

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for \$2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

7 days

1 day → 2+1 = 3 eggs
2 day → 4+2 = 6 eggs
3 day → 8+3 = 11 eggs
4 day → 16+4 = 19 eggs
5 day → 32+5 = 37 eggs

2.50(4)
\$10

2.50(341)
$\boxed{\$852.5}$

$$\frac{4103}{12}$$
↓
341.9
↓
341 dozes

Score 2: The student wrote one correct equation and stated $A = 4$ and $D = 8$.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

Determine algebraically how many of each type of chicken Allysa purchased.

$35 = 3.75A + 2.50D$

Americanas Delawares
$(8, 4)$

$12 = A + D$
$-D \qquad -D$

$12 - D = A$

$3.75(12 - D) + 2.50D = 35$

$-45D + 2.50D = 35$

$-42.50D = 35$
-42.50

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

$7.50 per week

Score 2: The student wrote a correct system of equations.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$3.75X + 2.5ey = \$35$$

$$X + Y = 12$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$\frac{20}{15}$$

$$3.75 \cdot 4 = 15 \qquad \Rightarrow 3.75X$$

$$2.50 \cdot 8 = 20$$

$$\begin{array}{cc} 20 & 6 \\ +15 & +4 \\ \hline 35 & 12 \end{array}$$

$$3.75X + 2.5ey = \$35$$
$$-3.75X \qquad -3.75X$$

$$\frac{2.5ey}{2.5e} = \frac{35}{2.5e} - \frac{3.75}{2.5e}X$$

$$Y = 14 - \frac{3.75X}{2.50}$$

$$X = 4$$
$$Y = 8$$

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

$$Dozen = 12$$

$$2.50(2) \qquad 2.50(1)$$
$$5 \qquad 2.50$$

$$750$$

$$\$90 \text{ each week}$$

Score 2: The student wrote an appropriate system of equations, but not in terms of A and D. The student stated appropriate values for their system.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

3.75 + 2.50
(A)   (B)

Determine algebraically how many of each type of chicken Allysa purchased.

\$ 4 americy chickns   8 Deleware chickers

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

2(D)
14 × 2.750

1 × 8
8×7.5

American $35.00 Perweek.
Delaware $20.00 Per week

$55.00 in all

Score 1: The student stated correct values for A and D.

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$3.75 \times A = X \qquad\qquad 2.50 \times D = X$$

Determine algebraically how many of each type of chicken Allysa purchased.

$3.75 = 1$
She can buy
9 Americana
chickens.

$2.50 = 1$
She can buy
14 Delaware
chickens.

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

$4 is what she
will take in each week.

Score 0: The student showed no correct work.

The State Education Department / The University of the State of New York

Regents Examination in Algebra I – August 2019

Chart for Converting Total Test Raw Scores to Final Exam Scores (Scale Scores)

(Use for the August 2019 exam only.)

Raw Score	Scale Score	Performance Level	Raw Score	Scale Score	Performance Level	Raw Score	Scale Score	Performance Level
86	100	5	57	81	4	28	66	3
85	99	5	56	81	4	27	65	3
84	98	5	55	81	4	26	64	2
83	96	5	54	81	4	25	63	2
82	95	5	53	80	4	24	61	2
81	94	5	52	80	4	23	60	2
80	93	5	51	80	4	22	58	2
79	92	5	50	80	4	21	57	2
78	91	5	49	79	3	20	55	2
77	90	5	48	79	3	19	53	1
76	90	5	47	79	3	18	51	1
75	89	5	46	78	3	17	49	1
74	88	5	45	78	3	16	47	1
73	87	5	44	78	3	15	45	1
72	87	5	43	77	3	14	43	1
71	86	5	42	77	3	13	41	1
70	86	5	41	76	3	12	38	1
69	86	5	40	76	3	11	36	1
68	85	5	39	75	3	10	33	1
67	84	4	38	75	3	9	30	1
66	84	4	37	74	3	8	27	1
65	84	4	36	74	3	7	24	1
64	83	4	35	73	3	6	21	1
63	83	4	34	72	3	5	18	1
62	83	4	33	71	3	4	15	1
61	82	4	32	70	3	3	11	1
60	82	4	31	70	3	2	8	1
59	82	4	30	69	3	1	4	1
58	82	4	29	68	3	0	0	1

To determine the student's final examination score (scale score), find the student's total test raw score in the column labeled "Raw Score" and then locate the scale score that corresponds to that raw score. The scale score is the student's final examination score. Enter this score in the space labeled "Scale Score" on the student's answer sheet.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart change from one administration to another, it is crucial that for each administration the conversion chart provided for that administration be used to determine the student's final score. The chart above is usable only for this administration of the Regents Examination in Algebra I.