

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

ALGEBRA I (Common Core)

Wednesday, August 13, 2014 — 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 graphs and drawings, which should be done in pencil. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. 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. 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]

Use this space for
computations.

- 1 Which statement is *not* always true?
- (1) The product of two irrational numbers is irrational.
 - (2) The product of two rational numbers is rational.
 - (3) The sum of two rational numbers is rational.
 - (4) The sum of a rational number and an irrational number is irrational.
- 2 A satellite television company charges a one-time installation fee and a monthly service charge. The total cost is modeled by the function $y = 40 + 90x$. Which statement represents the meaning of each part of the function?
- (1) y is the total cost, x is the number of months of service, \$90 is the installation fee, and \$40 is the service charge per month.
 - (2) y is the total cost, x is the number of months of service, \$40 is the installation fee, and \$90 is the service charge per month.
 - (3) x is the total cost, y is the number of months of service, \$40 is the installation fee, and \$90 is the service charge per month.
 - (4) x is the total cost, y is the number of months of service, \$90 is the installation fee, and \$40 is the service charge per month.
- 3 If $4x^2 - 100 = 0$, the roots of the equation are
- | | |
|--------------------|------------------|
| (1) -25 and 25 | (3) -5 and 5 |
| (2) -25 , only | (4) -5 , only |

**Use this space for
computations.**

- 4 Isaiah collects data from two different companies, each with four employees. The results of the study, based on each worker's age and salary, are listed in the tables below.

Company 1

Worker's Age in Years	Salary in Dollars
25	30,000
27	32,000
28	35,000
33	38,000

Company 2

Worker's Age in Years	Salary in Dollars
25	29,000
28	35,500
29	37,000
31	65,000

Which statement is true about these data?

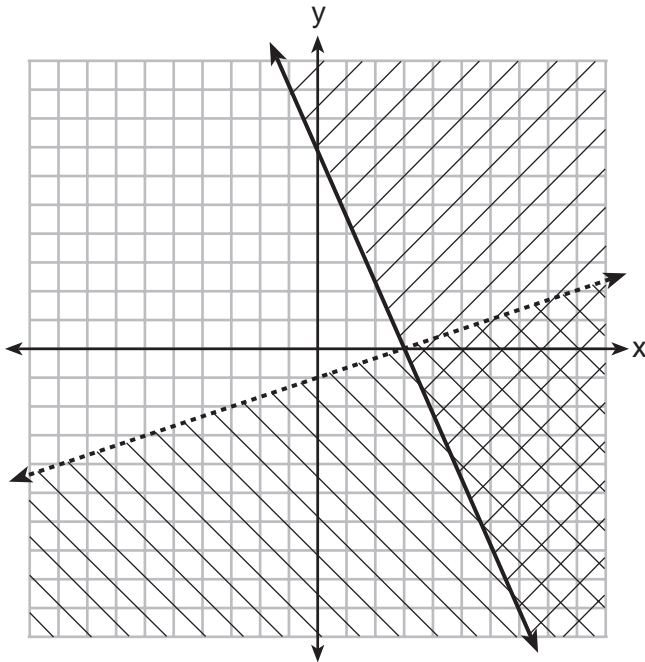
- (1) The median salaries in both companies are greater than \$37,000.
 - (2) The mean salary in company 1 is greater than the mean salary in company 2.
 - (3) The salary range in company 2 is greater than the salary range in company 1.
 - (4) The mean age of workers at company 1 is greater than the mean age of workers at company 2.
- 5 Which point is *not* on the graph represented by $y = x^2 + 3x - 6$?
- (1) $(-6, 12)$
 - (2) $(-4, -2)$
 - (3) $(2, 4)$
 - (4) $(3, -6)$

Use this space for computations.

6 A company produces x units of a product per month, where $C(x)$ represents the total cost and $R(x)$ represents the total revenue for the month. The functions are modeled by $C(x) = 300x + 250$ and $R(x) = -0.5x^2 + 800x - 100$. The profit is the difference between revenue and cost where $P(x) = R(x) - C(x)$. What is the total profit, $P(x)$, for the month?

- (1) $P(x) = -0.5x^2 + 500x - 150$
- (2) $P(x) = -0.5x^2 + 500x - 350$
- (3) $P(x) = -0.5x^2 - 500x + 350$
- (4) $P(x) = -0.5x^2 + 500x + 350$

7 What is one point that lies in the solution set of the system of inequalities graphed below?



- (1) (7,0)
- (2) (3,0)
- (3) (0,7)
- (4) (-3,5)

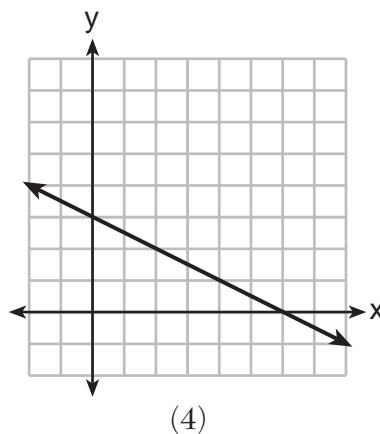
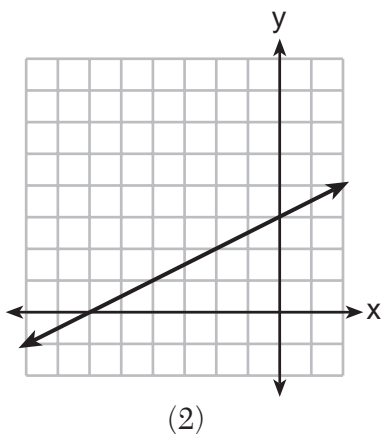
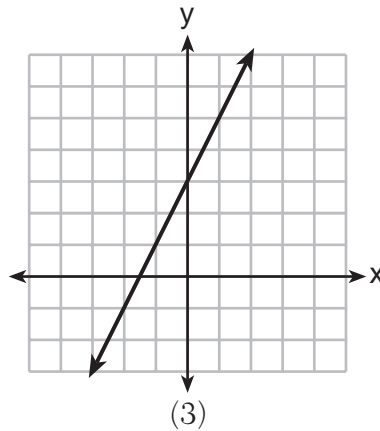
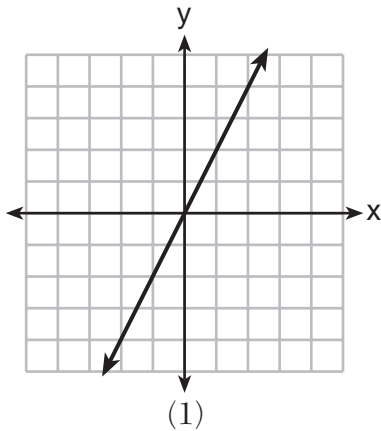
11 Let f be a function such that $f(x) = 2x - 4$ is defined on the domain $2 \leq x \leq 6$. The range of this function is

- (1) $0 \leq y \leq 8$ (3) $2 \leq y \leq 6$
 (2) $0 \leq y < \infty$ (4) $-\infty < y < \infty$

12 Which situation could be modeled by using a linear function?

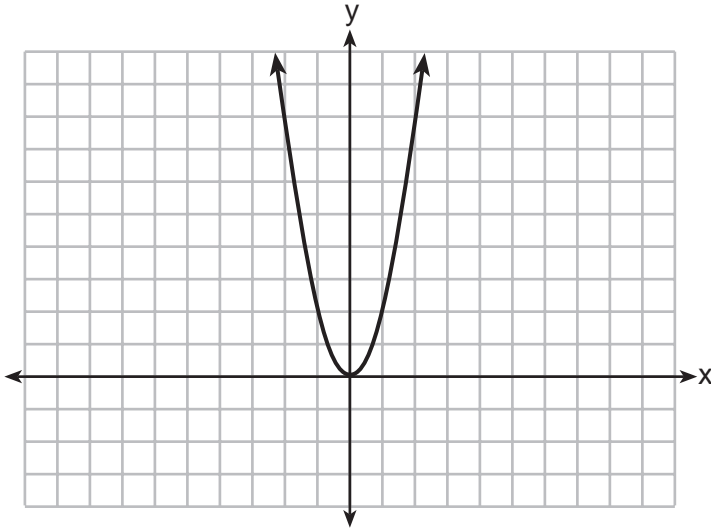
- (1) a bank account balance that grows at a rate of 5% per year, compounded annually
 (2) a population of bacteria that doubles every 4.5 hours
 (3) the cost of cell phone service that charges a base amount plus 20 cents per minute
 (4) the concentration of medicine in a person's body that decays by a factor of one-third every hour

13 Which graph shows a line where each value of y is three more than half of x ?



**Use this space for
computations.**

17 The graph of the equation $y = ax^2$ is shown below.



If a is multiplied by $-\frac{1}{2}$, the graph of the new equation is

- (1) wider and opens downward
- (2) wider and opens upward
- (3) narrower and opens downward
- (4) narrower and opens upward

18 The zeros of the function $f(x) = (x + 2)^2 - 25$ are

- (1) -2 and 5
- (2) -3 and 7
- (3) -5 and 2
- (4) -7 and 3

Use this space for computations.

19 During the 2010 season, football player McGee's earnings, m , were 0.005 million dollars more than those of his teammate Fitzpatrick's earnings, f . The two players earned a total of 3.95 million dollars. Which system of equations could be used to determine the amount each player earned, in millions of dollars?

- (1) $m + f = 3.95$
 $m + 0.005 = f$
- (2) $m - 3.95 = f$
 $f + 0.005 = m$
- (3) $f - 3.95 = m$
 $m + 0.005 = f$
- (4) $m + f = 3.95$
 $f + 0.005 = m$

20 What is the value of x in the equation $\frac{x-2}{3} + \frac{1}{6} = \frac{5}{6}$?

- (1) 4
- (2) 6
- (3) 8
- (4) 11

21 The table below shows the number of grams of carbohydrates, x , and the number of Calories, y , of six different foods.

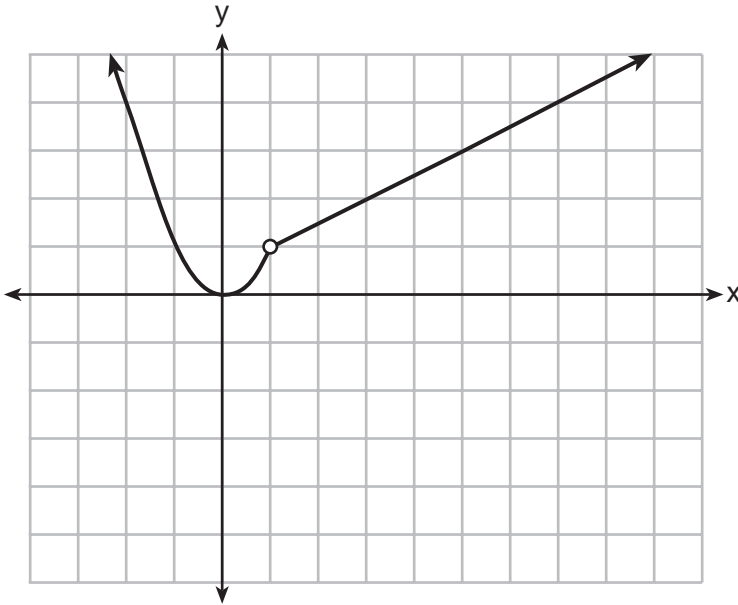
Carbohydrates (x)	Calories (y)
8	120
9.5	138
10	147
6	88
7	108
4	62

Which equation best represents the line of best fit for this set of data?

- (1) $y = 15x$
- (2) $y = 0.07x$
- (3) $y = 0.1x - 0.4$
- (4) $y = 14.1x + 5.8$

Use this space for computations.

22 A function is graphed on the set of axes below.



Which function is related to the graph?

(1) $f(x) = \begin{cases} x^2, & x < 1 \\ x - 2, & x > 1 \end{cases}$ (3) $f(x) = \begin{cases} x^2, & x < 1 \\ 2x - 7, & x > 1 \end{cases}$

(2) $f(x) = \begin{cases} x^2, & x < 1 \\ \frac{1}{2}x + \frac{1}{2}, & x > 1 \end{cases}$ (4) $f(x) = \begin{cases} x^2, & x < 1 \\ \frac{3}{2}x - \frac{9}{2}, & x > 1 \end{cases}$

23 The function $h(t) = -16t^2 + 144$ represents the height, $h(t)$, in feet, of an object from the ground at t seconds after it is dropped. A realistic domain for this function is

- (1) $-3 \leq t \leq 3$ (3) $0 \leq h(t) \leq 144$
(2) $0 \leq t \leq 3$ (4) all real numbers

24 If $f(1) = 3$ and $f(n) = -2f(n - 1) + 1$, then $f(5) =$

- (1) -5 (3) 21
(2) 11 (4) 43

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. 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]

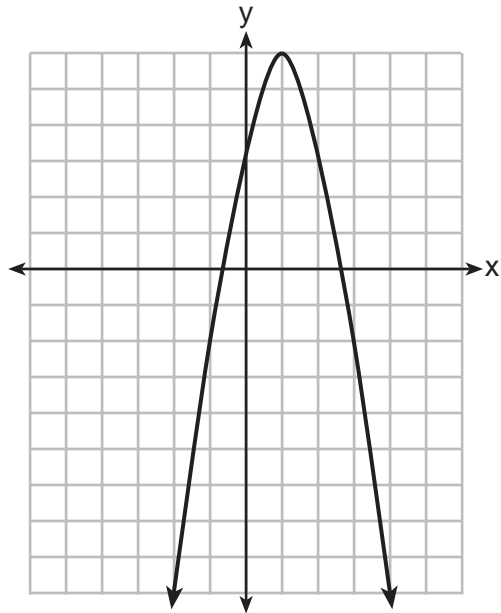
25 In the equation $x^2 + 10x + 24 = (x + a)(x + b)$, b is an integer. Find algebraically *all* possible values of b .

26 Rhonda deposited \$3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find B , her account balance after t years.

27 Guy and Jim work at a furniture store. Guy is paid \$185 per week plus 3% of his total sales in dollars, x , which can be represented by $g(x) = 185 + 0.03x$. Jim is paid \$275 per week plus 2.5% of his total sales in dollars, x , which can be represented by $f(x) = 275 + 0.025x$. Determine the value of x , in dollars, that will make their weekly pay the same.

28 Express the product of $2x^2 + 7x - 10$ and $x + 5$ in standard form.

29 Let f be the function represented by the graph below.



Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$.

Determine which function has the larger maximum value. Justify your answer.

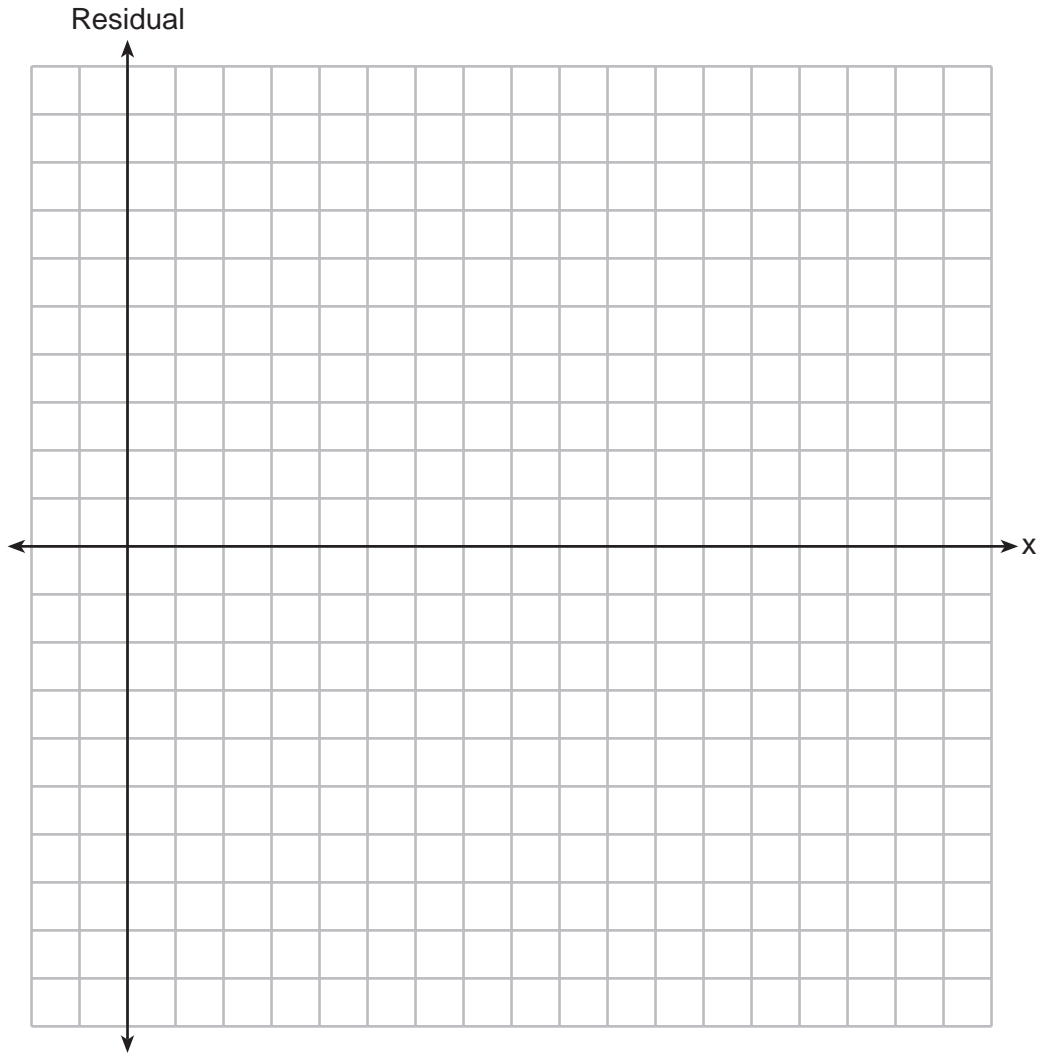
30 Solve the inequality below to determine and state the smallest possible value for x in the solution set.

$$3(x + 3) \leq 5x - 3$$

31 The table below represents the residuals for a line of best fit.

x	2	3	3	4	6	7	8	9	9	10
Residual	2	1	-1	-2	-3	-2	-1	2	0	3

Plot these residuals on the set of axes below.



Using the plot, assess the fit of the line for these residuals and justify your answer.

32 A student was given the equation $x^2 + 6x - 13 = 0$ to solve by completing the square. The first step that was written is shown below.

$$x^2 + 6x = 13$$

The next step in the student's process was $x^2 + 6x + c = 13 + c$.

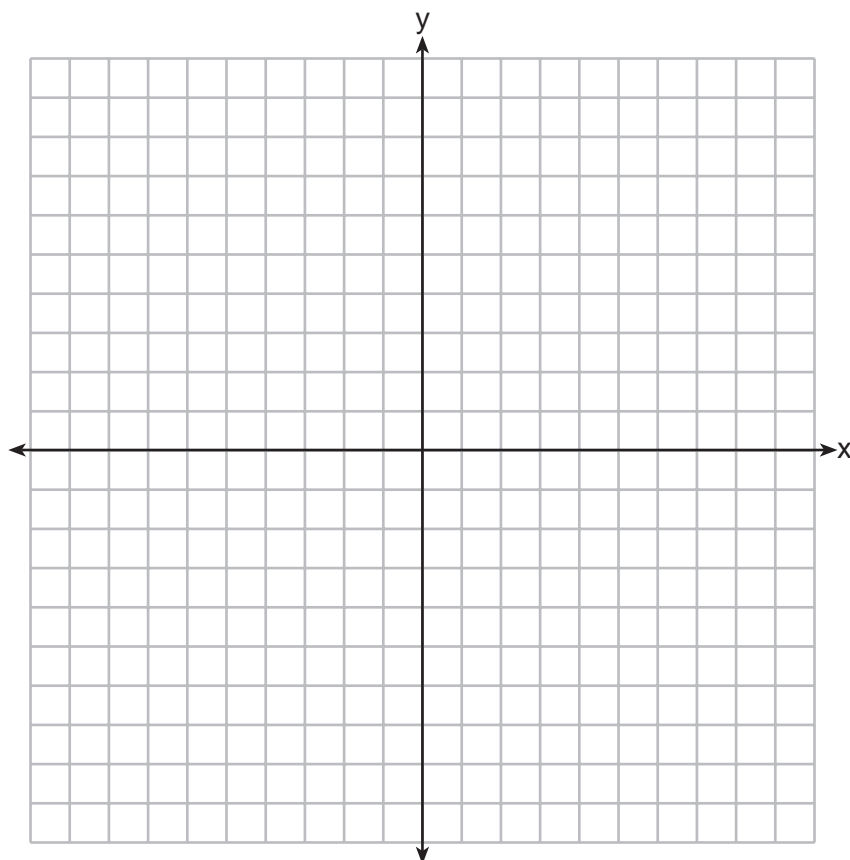
State the value of c that creates a perfect square trinomial.

Explain how the value of c is determined.

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. 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 axes below, graph $f(x) = |3x|$.



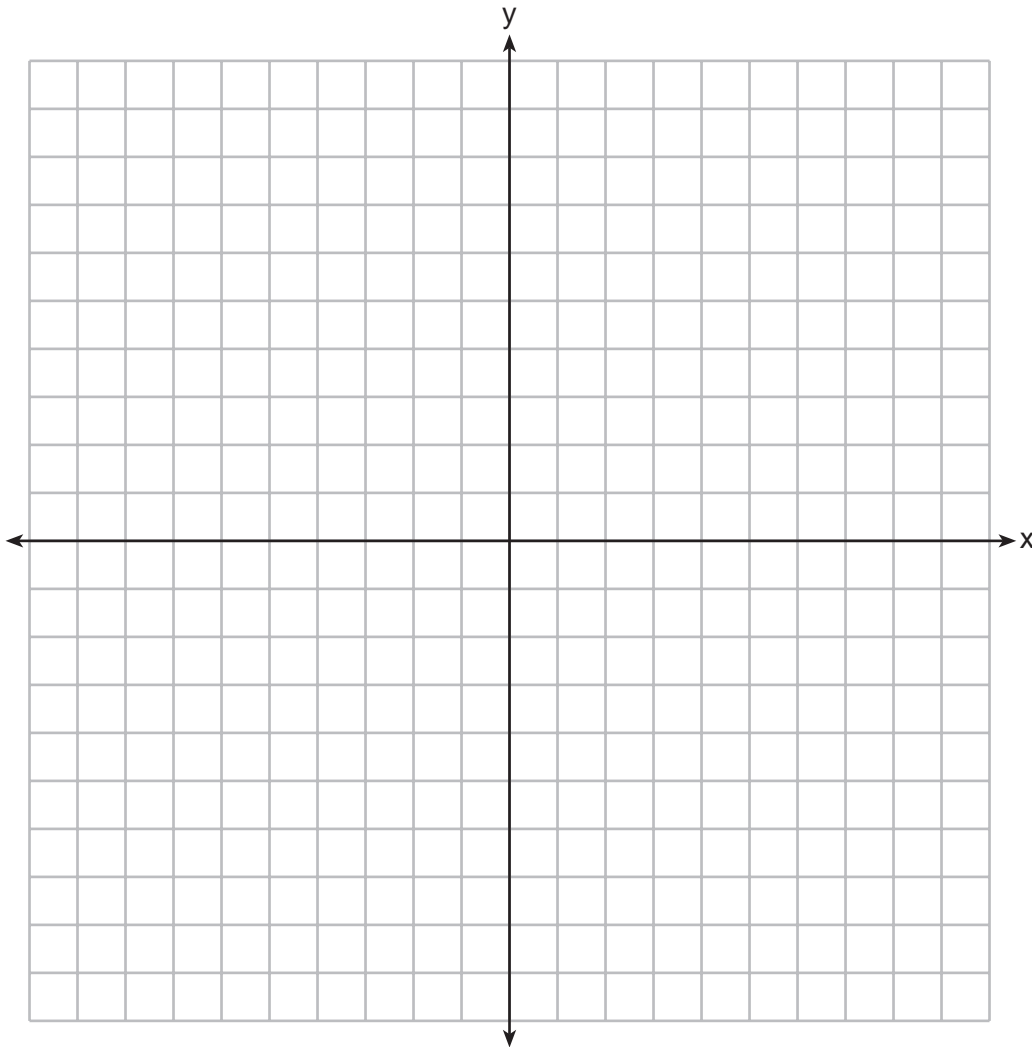
If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

34 The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Express b_1 in terms of A , h , and b_2 .

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

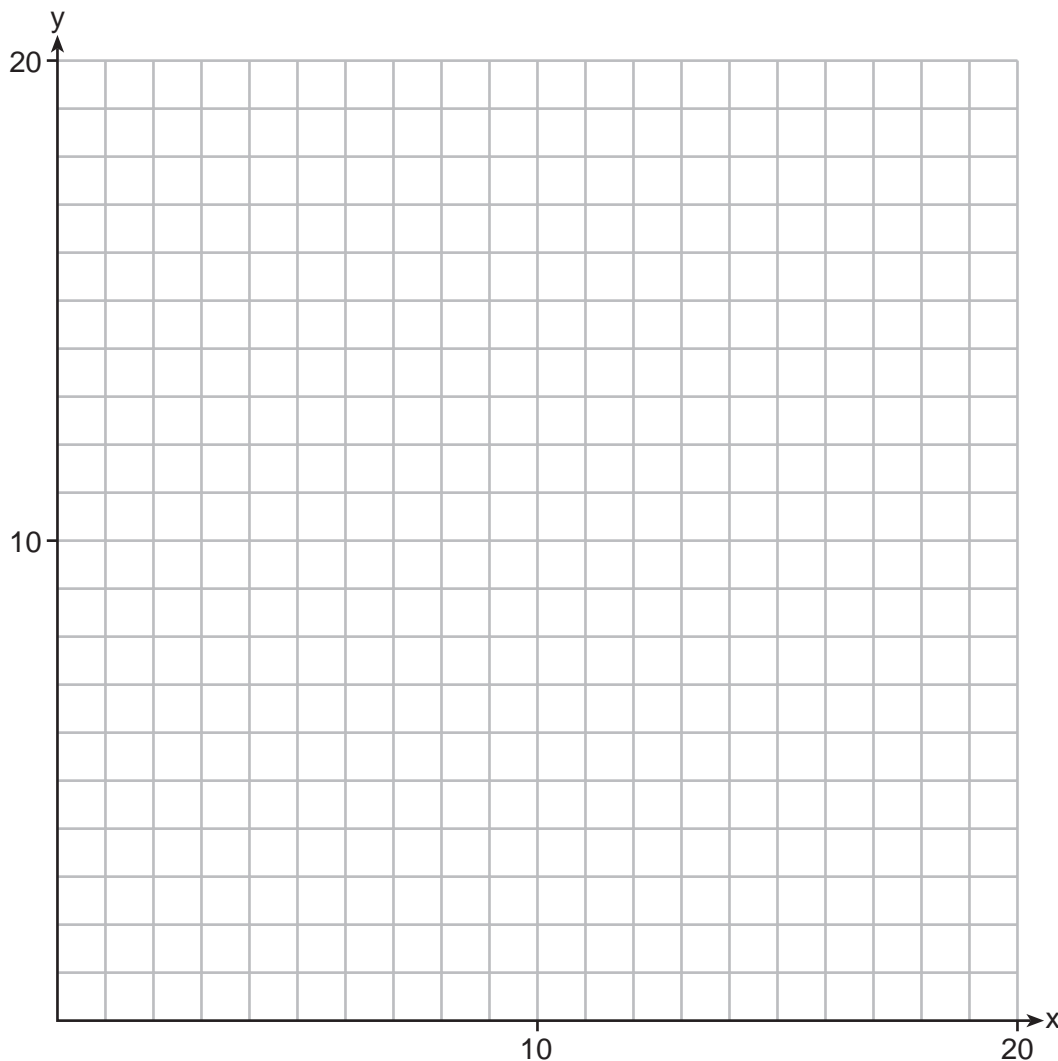
Part IV

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. 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 written in pencil. [6]

37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

Write a system of inequalities that can be used to represent the situation.

Graph these inequalities on the set of axes below.

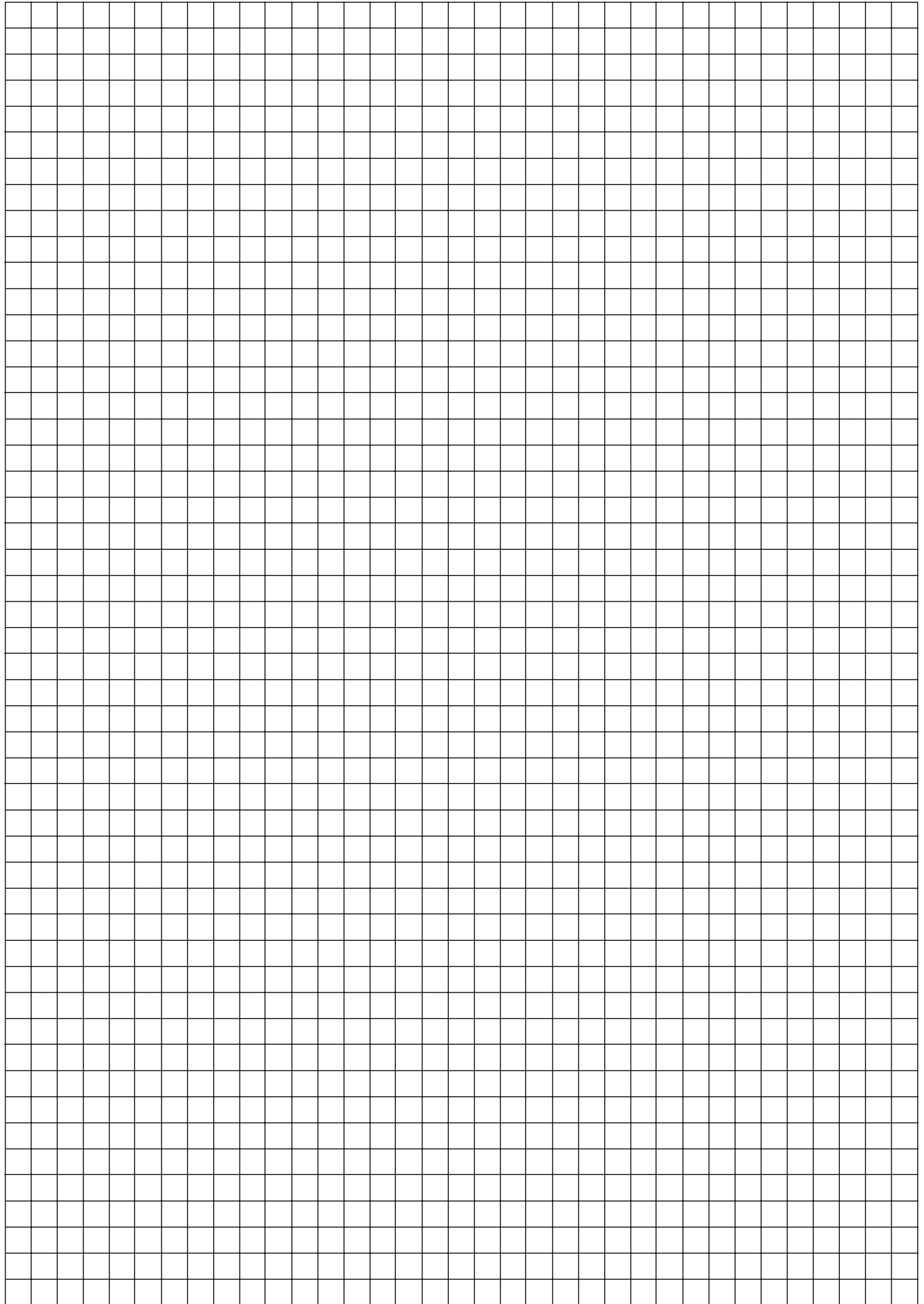


Question 37 is continued on the next page.

Question 37 continued

Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

Scrap Graph Paper — This sheet will *not* be scored.



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Scrap Graph Paper — This sheet will *not* be scored.



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

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FOR TEACHERS ONLY

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REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I (Common Core)

Wednesday, August 13, 2014 — 8:30 to 11:30 a.m., only

SCORING KEY AND RATING GUIDE

Mechanics of Rating

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

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/> by Wednesday, August 13, 2014. 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.

If the student's responses for the multiple-choice questions are being hand scored prior to being scanned, the scorer must be careful not to make any marks on the answer sheet except to record the scores in the designated score boxes. Marks elsewhere on the answer sheet will interfere with the accuracy of the scanning.

Part I

Allow a total of 48 credits, 2 credits for each of the following.

(1) 1	(9) 3	(17) 1
(2) 2	(10) 3	(18) 4
(3) 3	(11) 1	(19) 4
(4) 3	(12) 3	(20) 1
(5) 4	(13) 2	(21) 4
(6) 2	(14) 4	(22) 2
(7) 1	(15) 1	(23) 2
(8) 1	(16) 2	(24) 4

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.

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 (Common Core) 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 (Common Core)*, 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] 4 and 6, and correct algebraic work is shown, such as factoring.
- [1] Appropriate work is shown, but one computational or factoring error is made.
- or*
- [1] Appropriate work is shown, but one conceptual error is made.
- or*
- [1] Appropriate work is shown, but only one value is stated.
- or*
- [1] Appropriate work is shown to factor $x^2 + 10x + 24$, but no further correct work is shown.
- or*
- [1] Appropriate work is shown, but a method other than algebraic is used.
- or*
- [1] 4 and 6, 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] $B = 3000(1 + 0.042)^t$ or an equivalent equation in terms of B and t is written.
- [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] The expression $(1 + 0.042)^t$ is written.
- [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] 18,000, 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] 18,000, but no work is shown.

[0] $185 + 0.03x = 275 + 0.025x$, 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.

(28) [2] $2x^3 + 17x^2 + 25x - 50$ 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 the product is not written in standard form.

or

[1] $2x^3 + 17x^2 + 25x - 50$, but no work is shown.

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

(29) [2] $g(x)$, and a correct justification is given.

[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] $g(x)$ is stated, but an insufficient justification is given.

or

[1] Both maxima are stated, but no further correct work is shown.

[0] $g(x)$, but no justification is given.

or

[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] 6, 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 to find $x \geq 6$, but no further correct work is shown.

or

[1] 6, 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.

- (31) [2] A correct plot is drawn, poor fit is stated, and a correct justification is written, such as stating that a pattern is formed.
- [1] Appropriate work is shown, but one conceptual error is made, such as stating that it is a good fit because a pattern is formed.
- or*
- [1] An incorrect plot is drawn, but an appropriate fit and justification are stated.
- or*
- [1] A correct plot is drawn, but the statements are missing or are incorrect.
- [0] Poor fit is stated, 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.
- (32) [2] 9, and a correct explanation is written.
- [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] 9, but the explanation is missing or is incorrect.
- [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] A correct graph of $f(x)$ is drawn. A correct relationship for $g(x)$ is described, such as $g(x)$ is two units below $f(x)$. A correct relationship for $h(x)$ is described, such as $h(x)$ is shifted 4 units to the right of $f(x)$.

[3] One graphing error is made, but two appropriate relationships are described.

or

[3] A correct graph of $f(x)$ is drawn. One correct relationship is described, but the other relationship is incorrect or is missing.

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

or

[2] One graphing error is made, and only one appropriate relationship is described.

or

[2] No graph is drawn, but two correct relationships are described.

[1] No graph is drawn, but one correct relationship is described.

or

[1] One graphing error is made, and neither relationship is described appropriately.

[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] $\frac{2A - hb_2}{h}$ or an equivalent expression and 8, and correct work is shown.

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

or

[3] Appropriate work is shown to find $\frac{2A - hb_2}{h}$, but no further correct work is shown.

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

or

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

or

[2] $\frac{2A - hb_2}{h}$ and 8, but no work is shown.

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

or

[1] Appropriate work is shown to find 8, 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.

- (35) [4] Both functions are graphed correctly, and -2 and 1 are stated.
- [3] Appropriate work is shown, but one computational or graphing error is made.
- or***
- [3] Appropriate work is shown, but only one correct value for x is stated.
- or***
- [3] Appropriate work is shown, but the coordinates $(-2, -8)$ and $(1, -2)$ are stated rather than the values of x .
- [2] Appropriate work is shown, but two or more computational or graphing errors are made.
- or***
- [2] Appropriate work is shown, but one conceptual error is made.
- or***
- [2] Both functions are graphed correctly, but the x -values are not stated or are stated incorrectly.
- or***
- [2] -2 and 1 , but a method other than graphing is used.
- [1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.
- or***
- [1] $f(x)$ or $g(x)$ is graphed correctly, but no further correct work is shown.
- or***
- [1] -2 and 1 , 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.

- (36) [4] 60 and 100, and correct algebraic work is shown.
- [3] Appropriate work is shown, but one computational or factoring error is made.
- or***
- [3] Appropriate work is shown to find 60 or 100, and the negative root is rejected.
- [2] Appropriate work is shown, but two or more computational or factoring errors are made.
- or***
- [2] Appropriate work is shown, but one conceptual error is made.
- or***
- [2] Appropriate work is shown to find $(x - 60)(x + 100) = 0$, but no further correct work is shown.
- or***
- [2] A correct substitution is made into the quadratic formula, but no further correct work is shown.
- or***
- [2] 60 and 100, but a method other than algebraic is used.
- [1] Appropriate work is shown, but one conceptual error and one computational or factoring error are made.
- or***
- [1] $x^2 + 40x - 6000 = 0$ is written, but no further correct work is shown.
- or***
- [1] 60 and 100, 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.
-

Part IV

For each 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] $x + y \leq 15$ and $4x + 8y \geq 80$ are stated. Both inequalities are graphed and shaded correctly with at least one labeled correctly. A correct combination of babysitting hours and library hours is stated.

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

or

[5] $x + y \leq 15$ and $4x + 8y \geq 80$ are stated. Both inequalities are graphed correctly, with at least one labeled. A combination is not stated or is stated incorrectly.

or

[5] Two inequalities are written, but only one is stated correctly. Both inequalities are graphed and shaded appropriately, with at least one labeled. An appropriate combination of hours is stated.

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

or

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

or

[4] $x + y \leq 15$ and $4x + 8y \geq 80$ are stated. Both inequalities are graphed and shaded correctly, but neither graph is labeled. An appropriate combination is not stated or is stated incorrectly.

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

or

[3] Appropriate work is shown, but two or more computational, graphing, or labeling errors are made. An appropriate combination is not stated or is stated incorrectly.

or

[3] $x + y \leq 15$ and $4x + 8y \geq 80$ are stated and the lines $x + y = 15$ and $4x + 8y = 80$ are graphed correctly, and at least one is labeled correctly, but no further correct work is shown.

[2] Appropriate work is shown, but one conceptual error and two or more computational or graphing errors are made.

or

[2] $x + y \leq 15$ and $4x + 8y \geq 80$ are stated, but no further correct work is shown.

or

[2] Only one inequality is written and graphed correctly, but no further correct work is shown.

[1] Only one inequality is written correctly, but no further correct work is shown.

or

[1] An appropriate combination is given, 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.

**Map to the Common Core Learning Standards
Algebra I (Common Core)
August 2014**

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

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

Regents Examination in Algebra I (Common Core)

August 2014

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

The *Chart for Determining the Final Examination Score for the August 2014 Regents Examination in Algebra I (Common Core)* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Wednesday, August 13, 2014. Conversion charts provided for previous administrations of the Regents Examination in Algebra I (Common Core) 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 (Common Core)

Wednesday, August 13, 2014 — 8:30 a.m.

MODEL RESPONSE SET

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Question 25

25 In the equation $x^2 + 10x + 24 = (x + a)(x + b)$, b is an integer. Find algebraically *all* possible values of b .

$$\begin{array}{r|l|l} & x + 6 & \\ \hline x & x^2 & 6x \\ 4 & 4x & 24 \\ \hline \end{array}$$

possible values of b
6, 4

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

Question 25

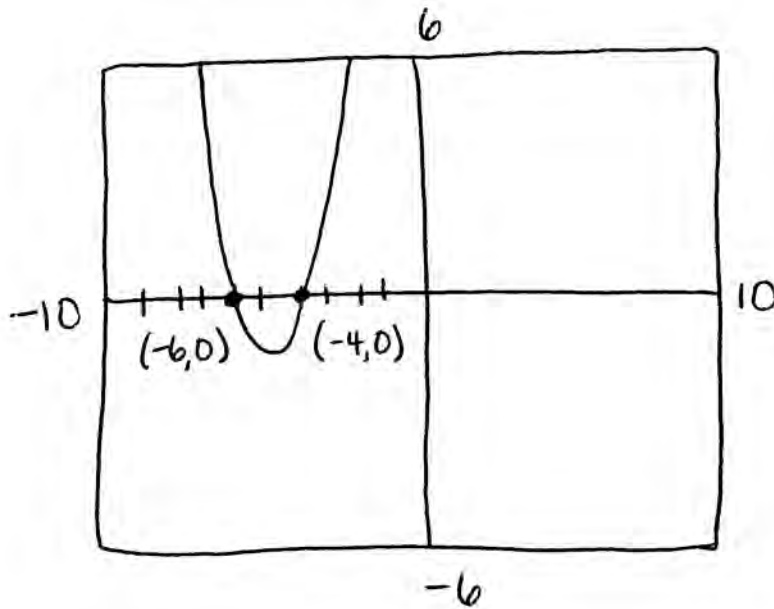
25 In the equation $x^2 + 10x + 24 = (x + a)(x + b)$, b is an integer. Find algebraically *all* possible values of b .

$$\begin{aligned} \cancel{x^2 + 10x + 24} &= \cancel{x^2 + bx + ax + ab} \\ (x+6)(x+4) &= (x+a)(x+b) \\ (x+6)(x+4) &= (x+6)(x+4) \\ b &= 4 \end{aligned}$$

Score 1: The student made one error by not stating all possible values of b .

Question 25

25 In the equation $x^2 + 10x + 24 = (x + a)(x + b)$, b is an integer. Find algebraically *all* possible values of b .



$b = 4$
and
 $b = 6$

Score 1: The student used a method other than algebraic to find possible b values.

Question 25

25 In the equation $x^2 + 10x + 24 = (x + a)(x + b)$, b is an integer. Find algebraically *all* possible values of b .

$$\begin{aligned}
 x^2 + 10x + 24 &= (x+a)(x+b) \\
 \cancel{x^2} + 10x + 24 &= \cancel{x^2} + bx + ax + ab \\
 \hline
 10x + 24 &= bx + ax + ab \\
 \frac{\quad}{x} & \quad \frac{\quad}{b \quad x} \\
 10 + 24 &= b + a + ab \\
 34 &= b + a + ab \\
 -a & \quad -a \\
 \hline
 34 - a &= b + \cancel{ab} \\
 -ab & \quad -ab \\
 \hline
 34 - 2ab &= b
 \end{aligned}$$

Score 0: The student's response contains at least two different errors.

Question 26

26 Rhonda deposited \$3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find B , her account balance after t years.

$$B = 3000(1 + 0.042)^t$$

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

Question 26

26 Rhonda deposited \$3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find B , her account balance after t years.

$$B = 3000(1.042)^t$$

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

Question 26

26 Rhonda deposited \$3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find B , her account balance after t years.

$$3000(1.042)^t$$

Score 1: The student made an error by not writing an equation.

Question 26

26 Rhonda deposited \$3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find B , her account balance after t years.

$$x = 3000(1 + 0.042)^t$$

Score 1: The student did not write an equation in terms of B and t .

Question 26

26 Rhonda deposited \$3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find B , her account balance after t years.

$$B = 3000(.042)^t$$

Score 1: The student made an error by not including the 1 in the growth factor.

Question 26

26 Rhonda deposited \$3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find B , her account balance after t years.

$$B = 3000(.42)^t$$

Score 0: The student made two errors by not including $(1 + r)$ and changing 4.2% to 0.42.

Question 27

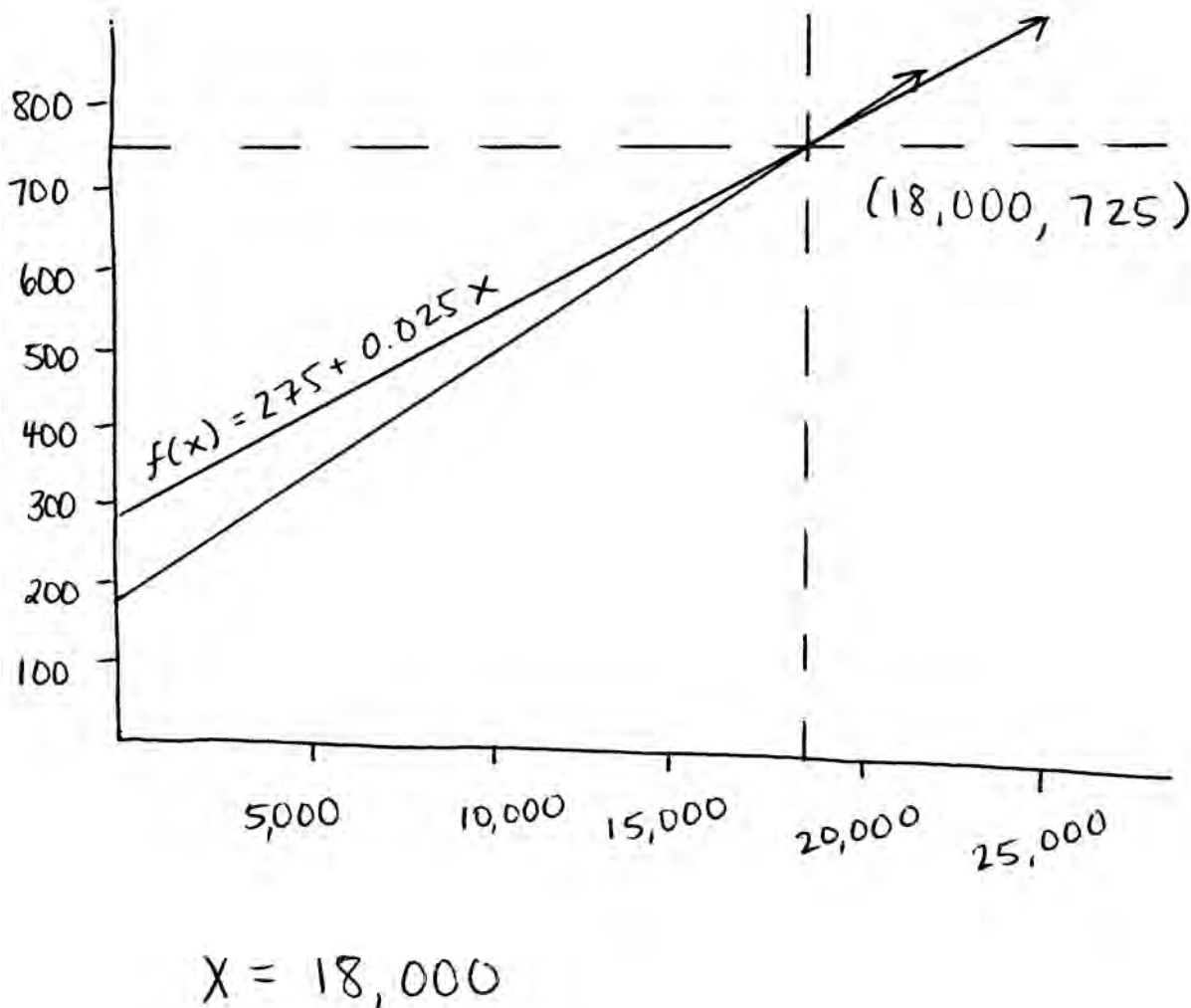
27 Guy and Jim work at a furniture store. Guy is paid \$185 per week plus 3% of his total sales in dollars, x , which can be represented by $g(x) = 185 + 0.03x$. Jim is paid \$275 per week plus 2.5% of his total sales in dollars, x , which can be represented by $f(x) = 275 + 0.025x$. Determine the value of x , in dollars, that will make their weekly pay the same.

$$\begin{array}{r|l} 185 + 0.03x & = 275 + 0.025x \\ -0.025x & -0.025x \\ \hline 185 + 0.005x & = 275 \\ -185 & -185 \\ \hline 0.005x & = 90 \\ \times 18000 & \\ \hline \boxed{18,000} & \end{array}$$

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

Question 27

27 Guy and Jim work at a furniture store. Guy is paid \$185 per week plus 3% of his total sales in dollars, x , which can be represented by $g(x) = 185 + 0.03x$. Jim is paid \$275 per week plus 2.5% of his total sales in dollars, x , which can be represented by $f(x) = 275 + 0.025x$. Determine the value of x , in dollars, that will make their weekly pay the same.



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

Question 27

27 Guy and Jim work at a furniture store. Guy is paid \$185 per week plus 3% of his total sales in dollars, x , which can be represented by $g(x) = 185 + 0.03x$. Jim is paid \$275 per week plus 2.5% of his total sales in dollars, x , which can be represented by $f(x) = 275 + 0.025x$. Determine the value of x , in dollars, that will make their weekly pay the same.

$$185 + 0.03x = 275 + 0.025x$$

Score 0: The student set the expressions equal, but showed no further correct work.

Question 27

27 Guy and Jim work at a furniture store. Guy is paid \$185 per week plus 3% of his total sales in dollars, x , which can be represented by $g(x) = 185 + 0.03x$. Jim is paid \$275 per week plus 2.5% of his total sales in dollars, x , which can be represented by $f(x) = 275 + 0.025x$. Determine the value of x , in dollars, that will make their weekly pay the same.

$\$185$ per week + 3% commission
 $\$5.55$

275 per week + 2.5% commission
 $\$6.88$

$\begin{array}{r} 2 \overline{)185} \\ \underline{x.03} \\ 585 \\ \underline{0000} \\ 5.55 \end{array}$	$\begin{array}{r} 2 \overline{)275} \\ \underline{x.025} \\ 1375 \\ \underline{5500} \\ 6.875 \end{array}$
---	--

Score 0: The student has a completely incorrect response.

Question 28

28 Express the product of $2x^2 + 7x - 10$ and $x + 5$ in standard form.

$$(2x^2 + 7x - 10)(x + 5)$$

$$2x^3 + 7x^2 - 10x + 10x^2 + 35x - 50$$

$$2x^3 + 17x^2 + 25x - 50$$

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

Question 28

28 Express the product of $2x^2 + 7x - 10$ and $x + 5$ in standard form.

$$\begin{array}{r} 2x^2 \\ +7x \\ -10 \end{array} \begin{array}{|c|c|} \hline x & +5 \\ \hline 2x^3 & 10x^2 \\ \hline 7x^2 & 35x \\ \hline -10x & -50 \\ \hline \end{array}$$

$$2x^3 + 10x^2 + 7x^2 + 35x - 10x - 50$$

$$2x^3 + 17x^2 + 25x - 50$$

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

Question 28

28 Express the product of $2x^2 + 7x - 10$ and $x + 5$ in standard form.

$$(2x^2 + 7x - 10)(x + 5)$$

$$10x^2 + 35x - 50 + 2x^3 + 7x^2 - 10x$$

$$2x^3 + 17x^2 + 25x - 50$$

Score 1: The student made one error when multiplying $2x^2$ and x .

Question 28

28 Express the product of $2x^2 + 7x - 10$ and $x + 5$ in standard form.

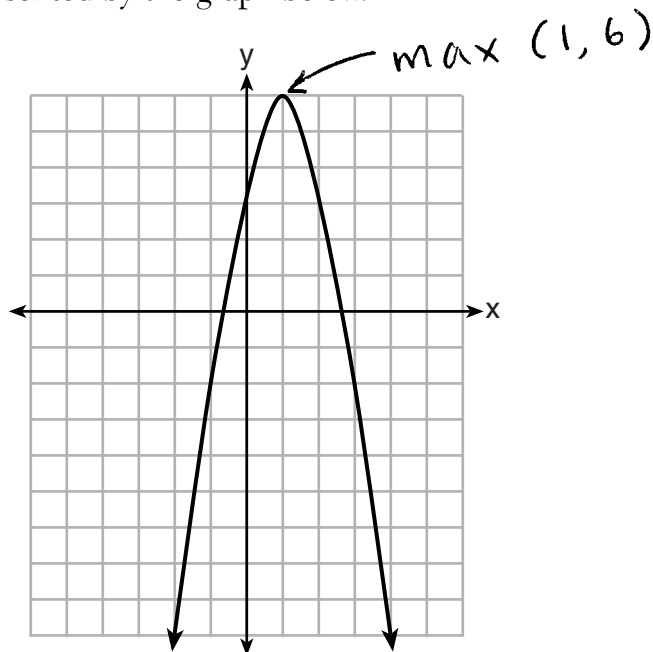
$$(2x^2 + 7x - 10)(x + 5)$$

$$2x^3 + 10x^2 + 7x^2 + 35x - 10x - 50$$

Score 1: The student did not express the product in standard form.

Question 29

29 Let f be the function represented by the graph below.



Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$.

Determine which function has the larger maximum value. Justify your answer.

$$g(x)$$

$$x = \frac{-b}{2a} = \frac{-4}{2(-\frac{1}{2})}$$

$$x = \frac{-4}{-1} = 4$$

$$g(x) = -\frac{1}{2}(4)^2 + 4(4) + 3$$

$$= -\frac{1}{2}(16) + 16 + 3$$

$$= -8 + 16 + 3$$

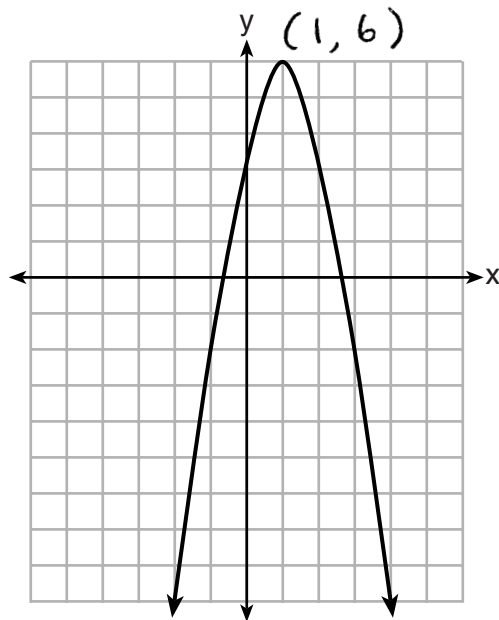
$$= 11$$

$$\text{max} \rightarrow (4, 11)$$

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

Question 29

29 Let f be the function represented by the graph below.



Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$.

Determine which function has the larger maximum value. Justify your answer.

$\sim \frac{-4}{2(-\frac{1}{2})} \quad 4 \quad -\frac{1}{2}(4)^2 + 4(4) + 3$

$g(x) = -\frac{1}{2}x^2 + 4x + 3$
 has a larger
 maximum
 value

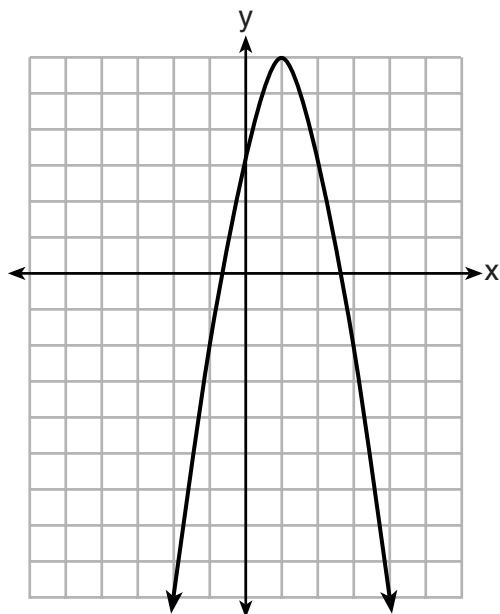
$16 \quad 16 + 3$
 $-8 + 16 + 3$
 $8 + 3$
 11

(4, 11)

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

Question 29

29 Let f be the function represented by the graph below.



Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$.

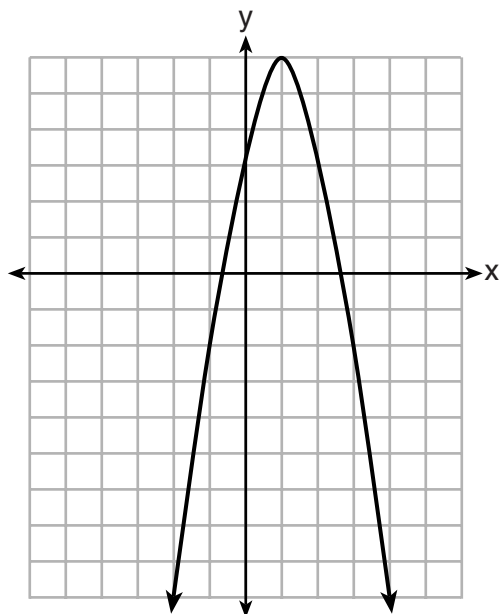
Determine which function has the larger maximum value. Justify your answer.

$g(x) = -\frac{1}{2}x^2 + 4x + 3$ has a greater maximum value because it goes higher.

Score 1: The student wrote an insufficient justification.

Question 29

29 Let f be the function represented by the graph below.



Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$.

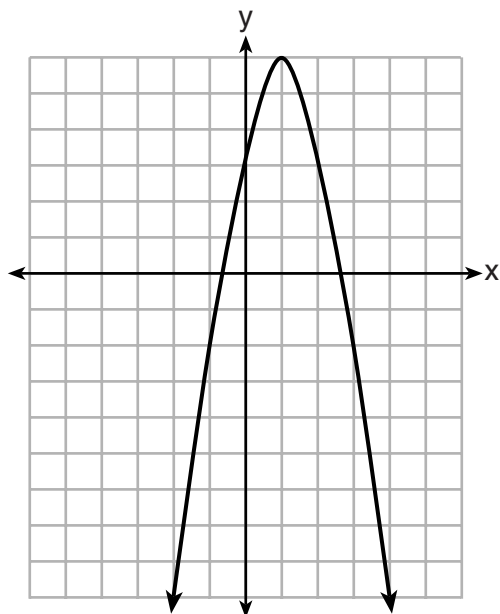
Determine which function has the larger maximum value. Justify your answer.

The maximum value is six because it is the highest point on the graph

Score 0: The student only found the maximum value of one function.

Question 29

29 Let f be the function represented by the graph below.



Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$.

Determine which function has the larger maximum value. Justify your answer.

$g(x) = -\frac{1}{2}x^2 + 4x + 3$ is the function that has the larger maximum value.

Score 0: The student stated $g(x)$, but gave no justification.

Question 30

30 Solve the inequality below to determine and state the smallest possible value for x in the solution set.

$$\begin{aligned} 3(x+3) &\leq 5x-3 \\ 3x+9 &\leq 5x-3 \\ -3x &\quad -3x \\ \hline 9 &\leq 2x-3 \\ +3 &\quad +3 \\ \hline 12 &\leq 2x \\ \frac{12}{2} &\quad \frac{2x}{2} \\ 6 &\leq x \end{aligned}$$

Smallest possible value = 6

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

Question 30

30 Solve the inequality below to determine and state the smallest possible value for x in the solution set.

$$\begin{aligned} 3(x + 3) &\leq 5x - 3 \\ 3x + 9 &\leq 5x - 3 \\ \hline 3x + 12 &\leq 5x \\ -3x &\quad -3x \\ \hline 12 &\leq 2x \\ \frac{12}{2} &\leq \frac{2x}{2} \\ x &\geq 6 \end{aligned}$$

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

Question 30

30 Solve the inequality below to determine and state the smallest possible value for x in the solution set.

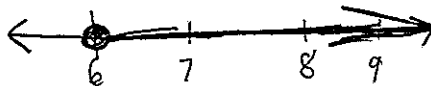
$$3(x + 3) \leq 5x - 3$$

$$\begin{array}{r} \cancel{3x} + 9 \leq 5x - 3 \\ -3x \quad -3x \end{array}$$

$$\begin{array}{r} 9 \leq 2x - 3 \\ +3 \quad +3 \end{array}$$

$$\frac{12}{2} \leq \frac{2x}{2}$$

$$6 \leq x$$



Score 1: The student did not state 6 as the smallest possible value.

Question 30

30 Solve the inequality below to determine and state the smallest possible value for x in the solution set.

$$3(x + 3) \leq 5x - 3$$

$$\begin{array}{r} 3x+6 \leq 5x-3 \\ -3x \quad -3x \\ \hline 6 \leq 2x-3 \\ +3 \quad +3 \end{array}$$

$$\hline 9 \leq 2x$$

$$4.5 \leq x$$

$$\textcircled{4.5}$$

Score 1: The student made one computational error when distributing 3.

Question 30

30 Solve the inequality below to determine and state the smallest possible value for x in the solution set.

$$3(x + 3) \leq 5x - 3$$

$$\begin{array}{r} 3x + 9 \leq 5x - 3 \\ -3x \quad -3x \\ \hline \end{array}$$

$$\begin{array}{r} 9 \leq 2x - 3 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\frac{12 \leq 2x}{2 \quad 2}$$

$$\underline{1x \leq 6}$$

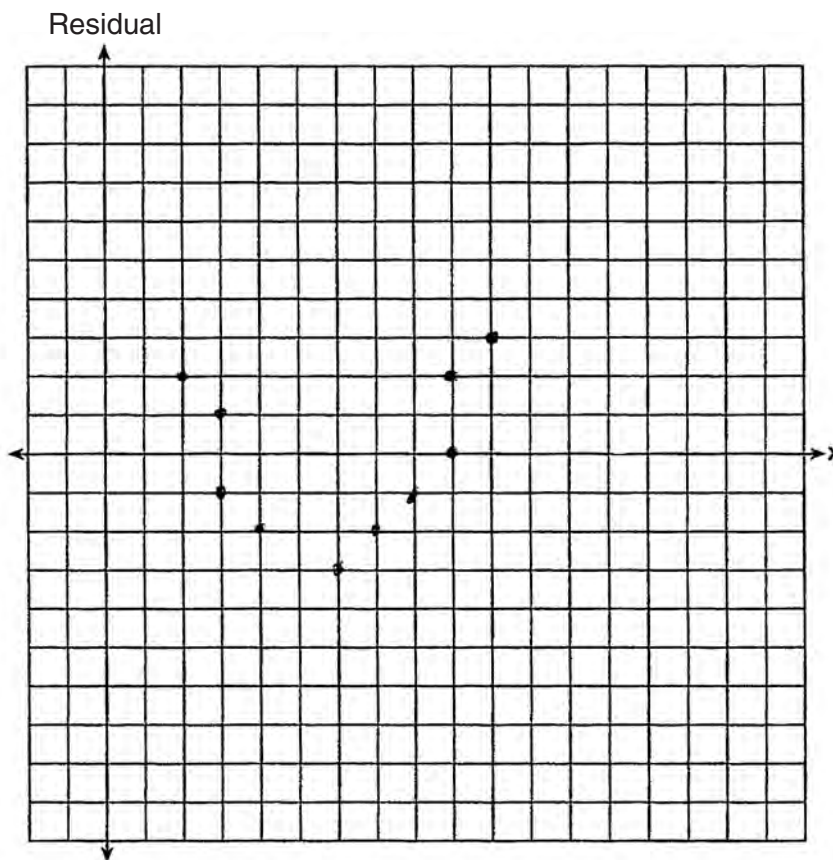
Score 0: The student made an error when solving the inequality and did not state that there is no smallest value of x possible.

Question 31

31 The table below represents the residuals for a line of best fit.

x	2	3	3	4	6	7	8	9	9	10
Residual	2	1	-1	-2	-3	-2	-1	2	0	3

Plot these residuals on the set of axes below.



Using the plot, assess the fit of the line for these residuals and justify your answer.

bad fit because there is pattern in the residuals

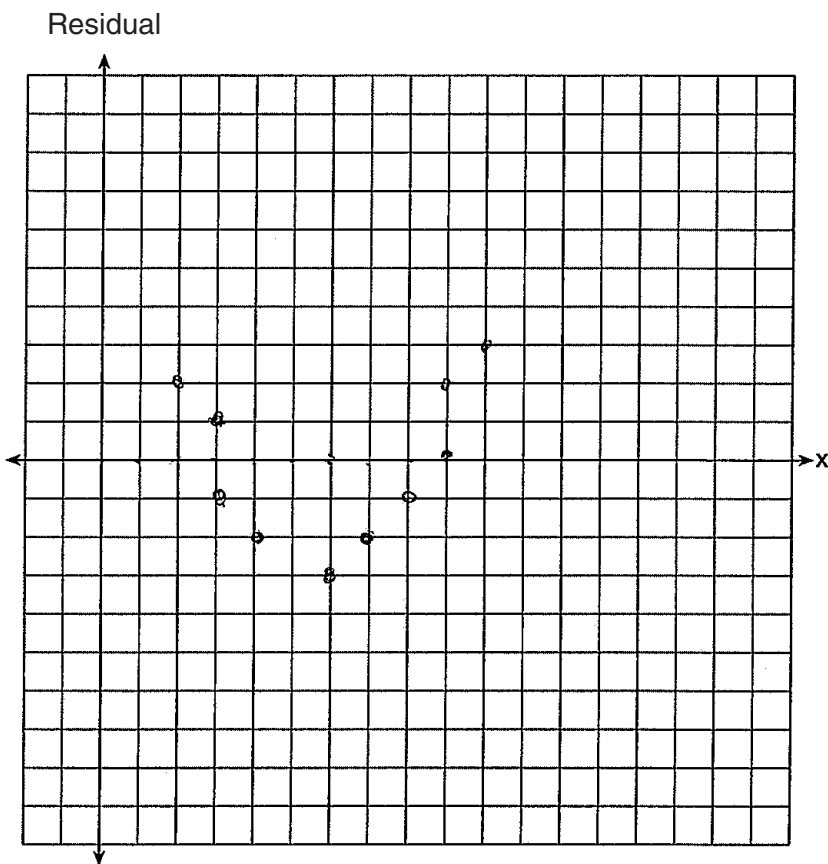
Score 2: The student has a complete and correct response.

Question 31

31 The table below represents the residuals for a line of best fit.

x	2	3	3	4	6	7	8	9	9	10
Residual	2	1	-1	-2	-3	-2	-1	2	0	3

Plot these residuals on the set of axes below.



Using the plot, assess the fit of the line for these residuals and justify your answer.

The is no pattern followed in the function

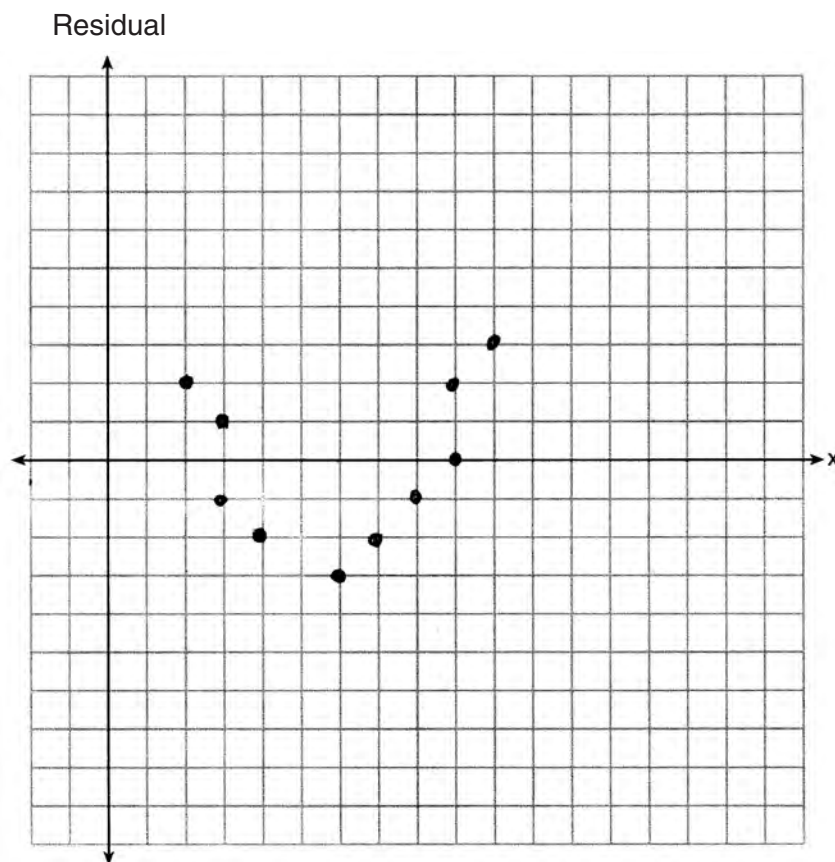
Score 1: The student drew a correct plot, but did not assess the fit of the line.

Question 31

31 The table below represents the residuals for a line of best fit.

x	2	3	3	4	6	7	8	9	9	10
Residual	2	1	-1	-2	-3	-2	-1	2	0	3

Plot these residuals on the set of axes below.



Using the plot, assess the fit of the line for these residuals and justify your answer.

Bad fit

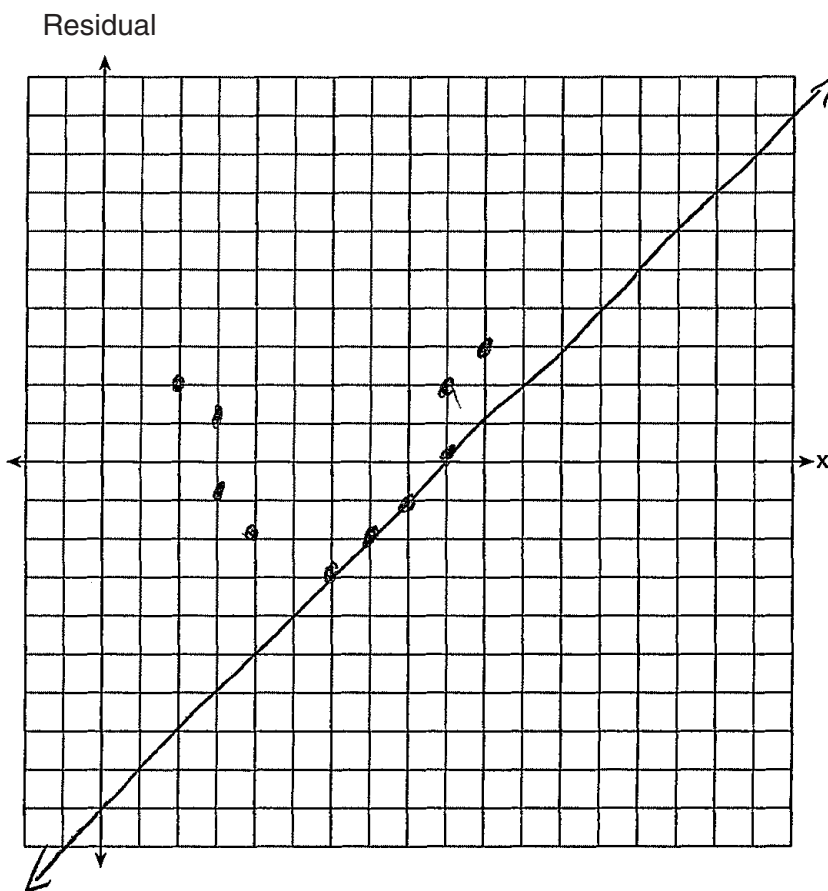
Score 1: The student drew a correct plot and correctly characterized the fit, but gave no justification.

Question 31

31 The table below represents the residuals for a line of best fit.

x	2	3	3	4	6	7	8	9	9	10
Residual	2	1	-1	-2	-3	-2	-1	2	0	3

Plot these residuals on the set of axes below.



Using the plot, assess the fit of the line for these residuals and justify your answer.

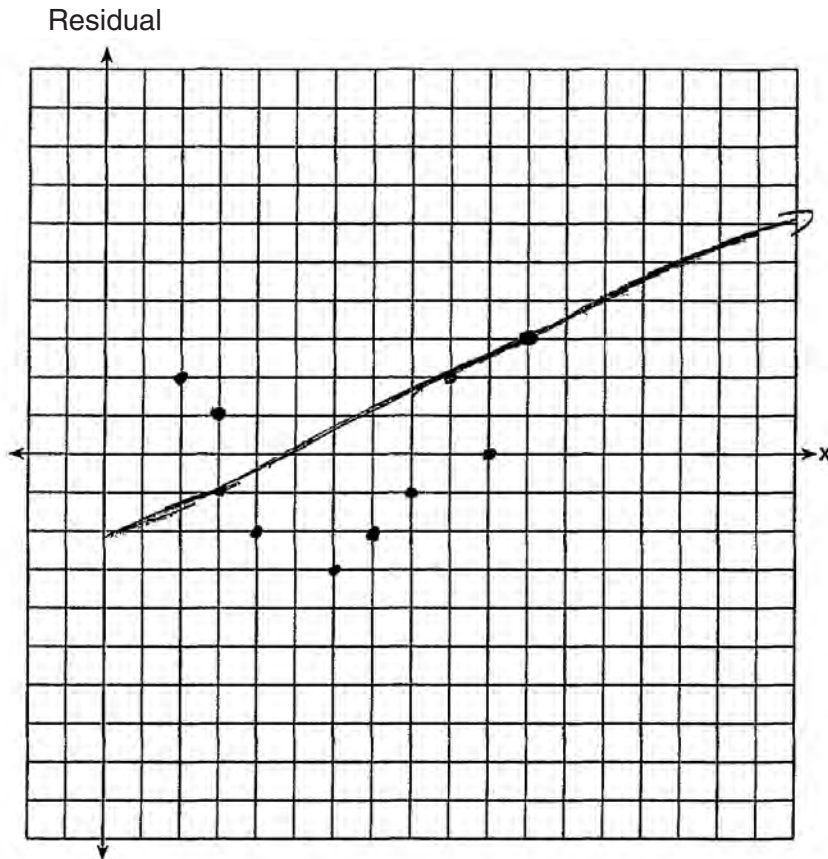
Score 1: The student plotted the residuals correctly, but showed no further correct work.

Question 31

31 The table below represents the residuals for a line of best fit.

x	2	3	3	4	6	7	8	9	9	10
Residual	2	1	-1	-2	-3	-2	-1	2	0	3

Plot these residuals on the set of axes below.



Using the plot, assess the fit of the line for these residuals and justify your answer.

The line of best fit is that because it's close to most of the points.

Score 0: The student drew an incorrect plot and wrote an incorrect justification.

Question 32

32 A student was given the equation $x^2 + 6x - 13 = 0$ to solve by completing the square. The first step that was written is shown below.

$$x^2 + 6x = 13$$

The next step in the student's process was $x^2 + 6x + c = 13 + c$.

State the value of c that creates a perfect square trinomial.

$$c = \left(\frac{b}{2}\right)^2 \quad c = \left(\frac{6}{2}\right)^2 \quad c = (3)^2$$

$c = 9$

Explain how the value of c is determined.

The value of c is determined by taking the "b" & dividing it by 2, then squaring it.

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

Question 32

32 A student was given the equation $x^2 + 6x - 13 = 0$ to solve by completing the square. The first step that was written is shown below.

$$x^2 + 6x = 13$$

The next step in the student's process was $x^2 + 6x + c = 13 + c$.

State the value of c that creates a perfect square trinomial.

$$c = 9$$

Explain how the value of c is determined.

divide 6 in half then
square that answer

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

Question 32

32 A student was given the equation $x^2 + 6x - 13 = 0$ to solve by completing the square. The first step that was written is shown below.

$$x^2 + 6x = 13$$

The next step in the student's process was $x^2 + 6x + c = 13 + c$.

State the value of c that creates a perfect square trinomial.

$$c=9$$

$$\begin{array}{l} \overbrace{(x+3)} \quad \overbrace{(x+3)} \\ x^2 + 3x + 3x + 9 \\ x^2 + 6x + 9 \end{array}$$

Explain how the value of c is determined.

When $c = 9$, the trinomial is the product of $(x+3)^2$ a perfect square.

Score 1: The student found $c = 9$, but wrote an incorrect explanation.

Question 32

32 A student was given the equation $x^2 + 6x - 13 = 0$ to solve by completing the square. The first step that was written is shown below.

$$x^2 + 6x = 13$$

The next step in the student's process was $x^2 + 6x + c = 13 + c$.

State the value of c that creates a perfect square trinomial.

18

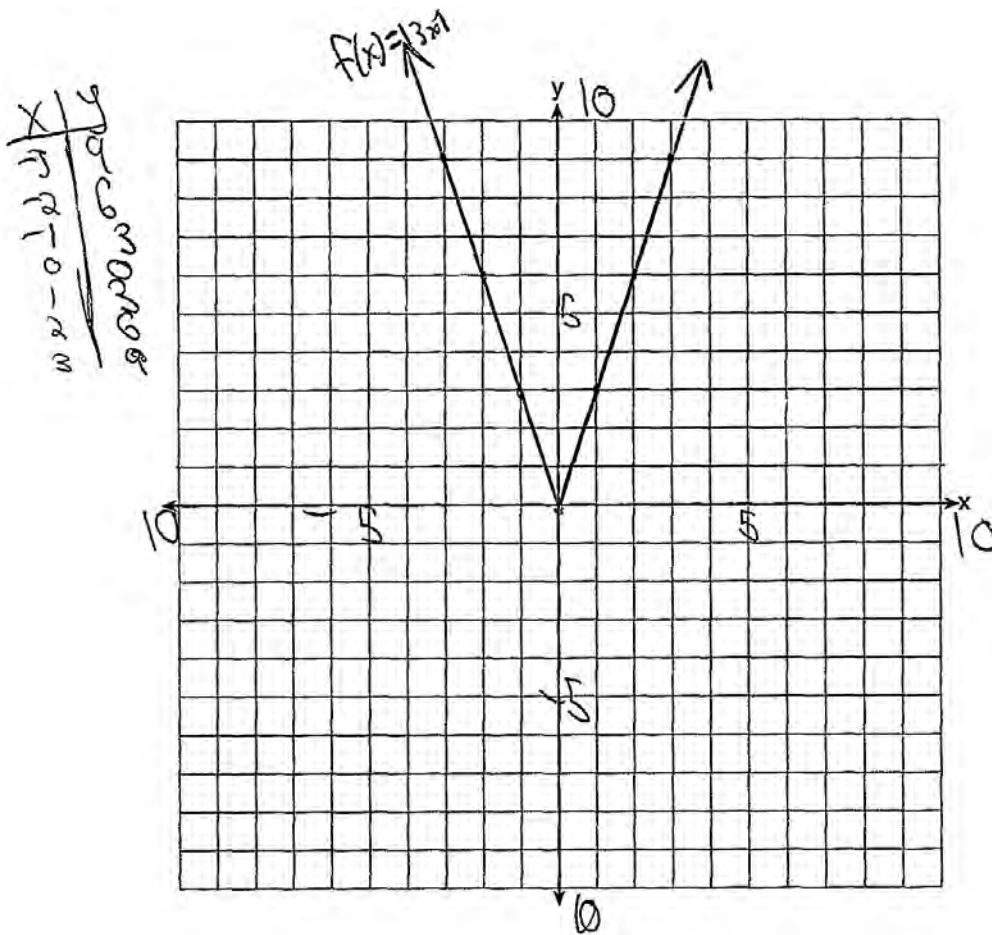
Explain how the value of c is determined.

Adding 5 to both
sides of the
equation.

Score 0: The student wrote an irrelevant response.

Question 33

33 On the axes below, graph $f(x) = |3x|$.



If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

graph $g(x)$ would be two points below graph $f(x)$

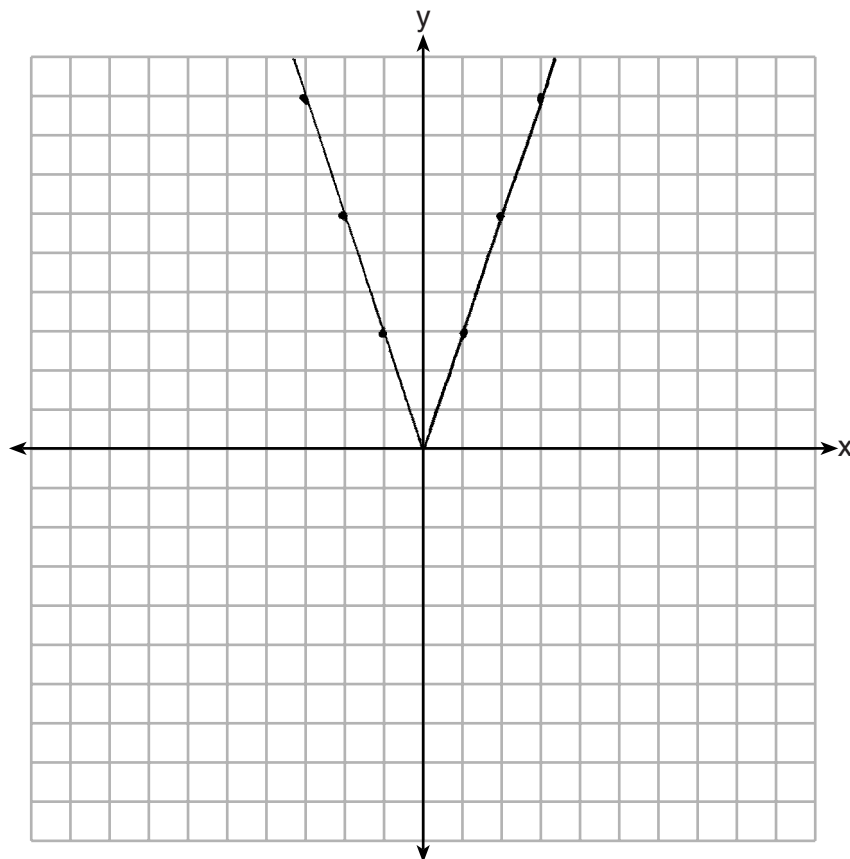
If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

$h(x)$ would 4 points to the right

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

Question 33

33 On the axes below, graph $f(x) = |3x|$.



If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

2 down

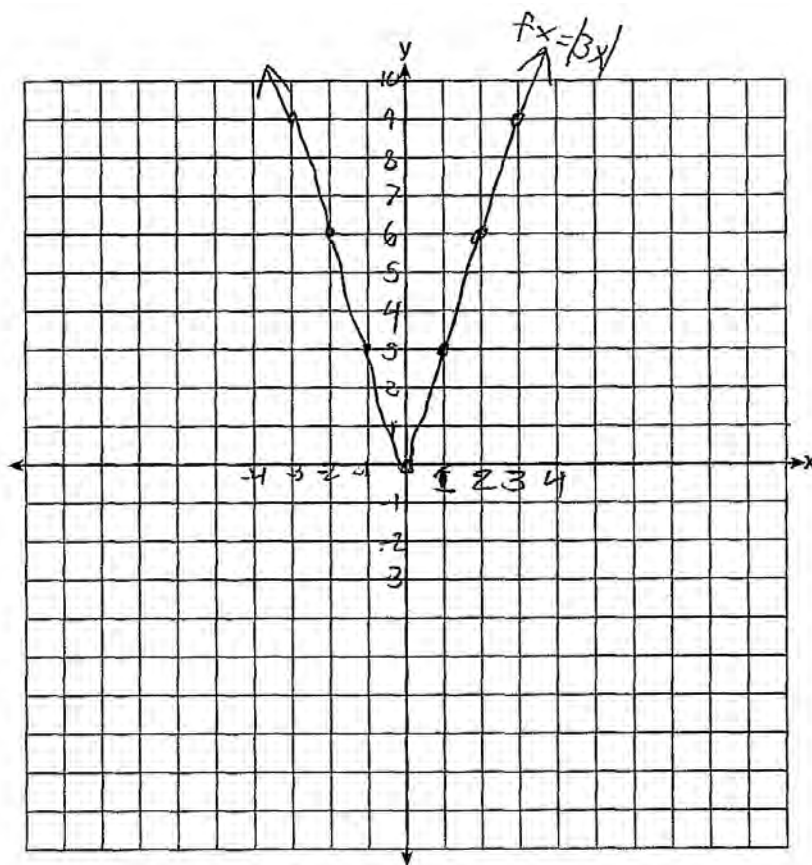
If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

4 right

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

Question 33

33 On the axes below, graph $f(x) = |3x|$.



If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

The dots would be two dots lower.

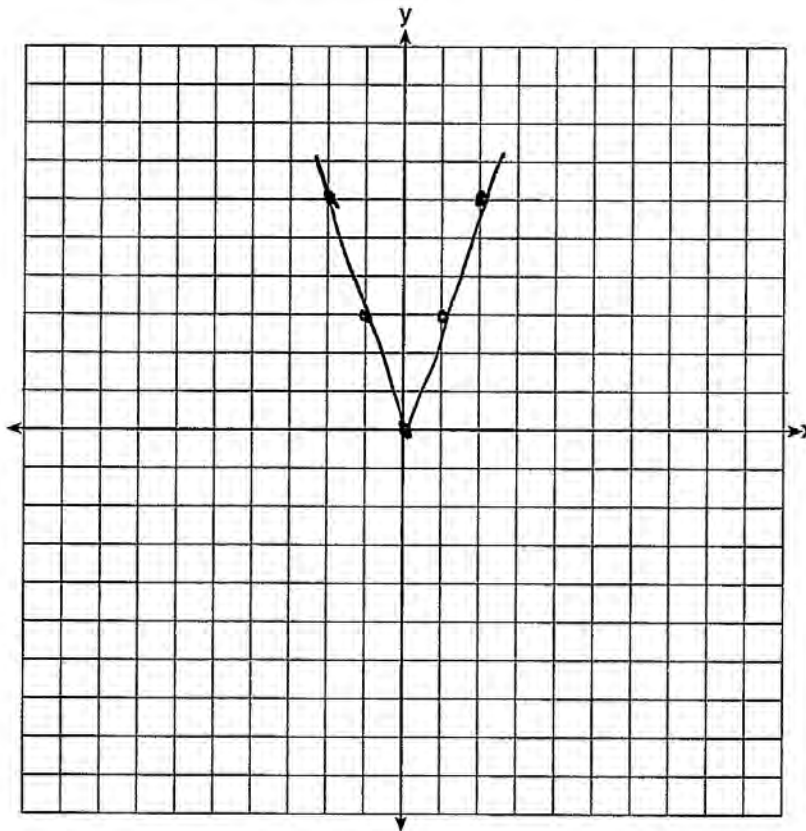
If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

Score 3: The student drew a correct graph, but only included a correct description for one relationship.

Question 33

33 On the axes below, graph $f(x) = |3x|$.

x	3x	y
-2	6	6
-1	3	3
0	0	0
1	3	3
2	6	6



If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

The graph of $g(x)$ is two spaces underneath the graph of $f(x)$

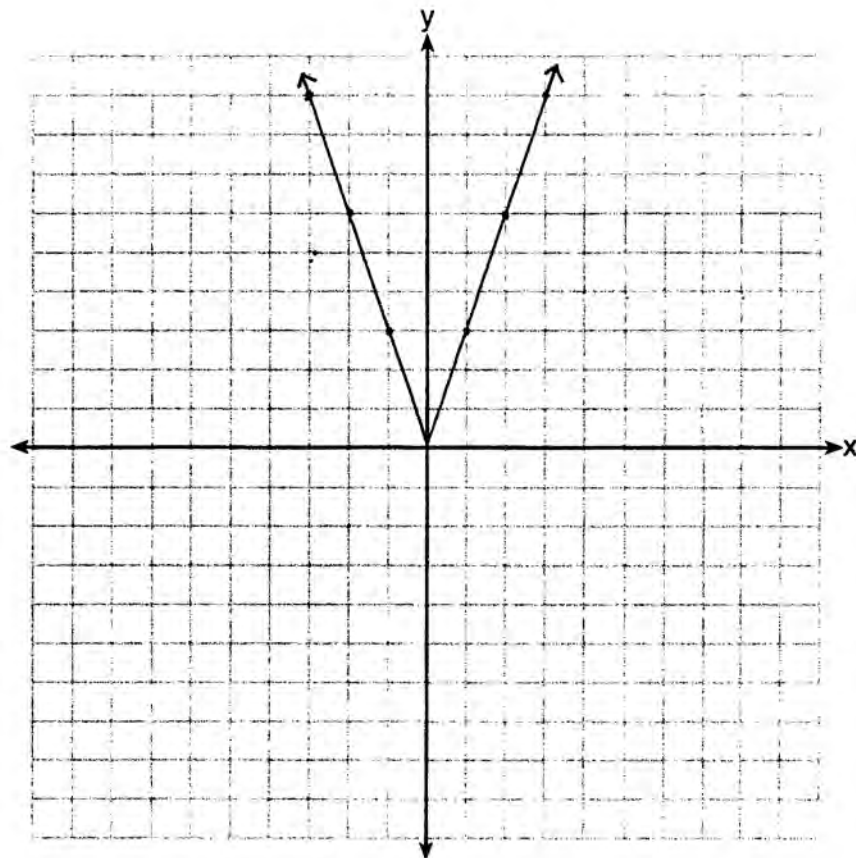
If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

~~f(x)~~ The graph of $h(x)$ is 4 spaces ~~under~~ to the left of the graph of $f(x)$.

Score 2: The student did not show a complete graph for $f(x)$ (the graph must have either arrows or extend to the edge of the grid) and did not include a correct relationship describing how $h(x)$ is related to $f(x)$.

Question 33

33 On the axes below, graph $f(x) = |3x|$.



If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

2

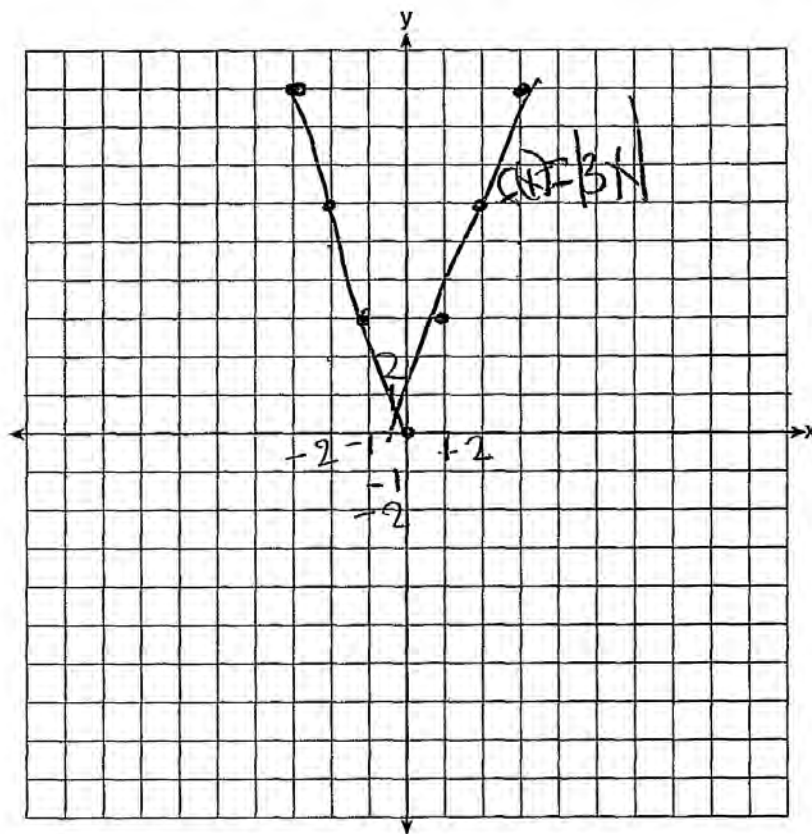
If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

4

Score 2: The student drew a correct graph, but did not state the direction of the translations.

Question 33

33 On the axes below, graph $f(x) = |3x|$.



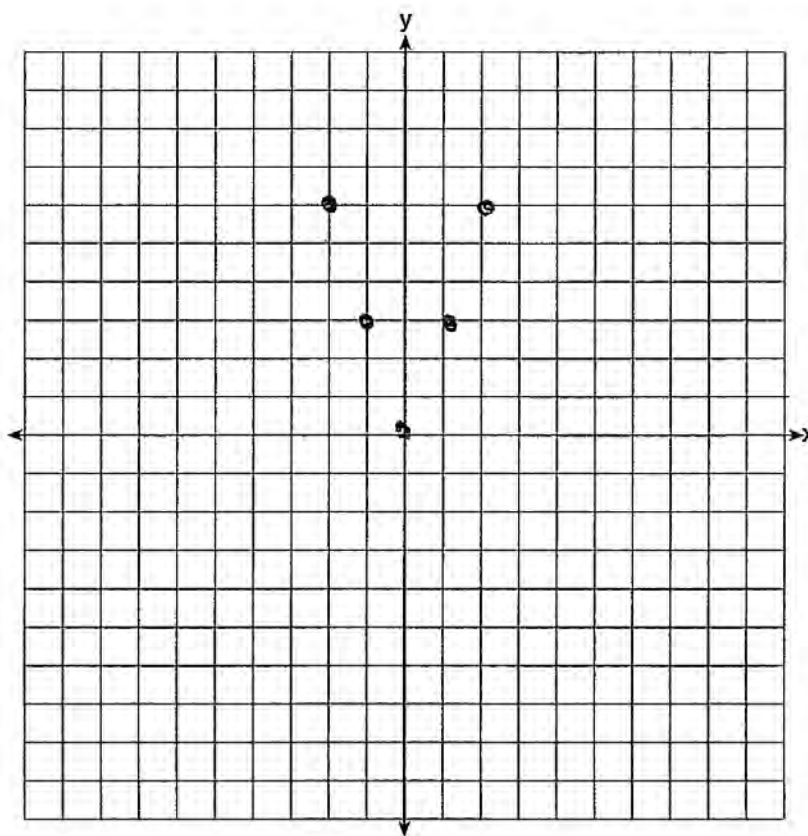
If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

Score 1: The student did not draw a complete graph for $f(x)$ and did not describe how $g(x)$ and $h(x)$ are related to $f(x)$.

Question 33

33 On the axes below, graph $f(x) = |3x|$.



x	y
-2	6
-1	3
0	0
1	3
2	6

If $g(x) = f(x) - 2$, how is the graph of $f(x)$ translated to form the graph of $g(x)$?

If $h(x) = f(x - 4)$, how is the graph of $f(x)$ translated to form the graph of $h(x)$?

Score 0: The student did not show sufficient work.

Question 34

34 The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Express b_1 in terms of A , h , and b_2 .

$$\begin{array}{l} A = \frac{1}{2}h(b_1 + b_2) \\ \frac{1}{2}h \quad \frac{1}{2}h \\ \frac{A}{\frac{1}{2}h} = b_1 + b_2 \\ \underline{\quad - b_2 \quad} \quad \quad \quad \frac{A}{\frac{1}{2}h} - b_2 = b_1 \end{array}$$

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.

$$\begin{array}{l} b_1 = \frac{2A}{h} - b_2 \\ \frac{2(60)}{6} - 12 \\ \frac{120}{6} - 12 \\ 20 - 12 \\ b_1 = 8 \\ \boxed{8 \text{ feet}} \end{array}$$

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

Question 34

34 The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Express b_1 in terms of A , h , and b_2 .

$$\begin{aligned} A &= .5h(b_1 + b_2) \\ \frac{A}{.5h} &= \frac{.5h(b_1 + b_2)}{.5h} \\ \frac{A}{.5h} &= b_1 + b_2 \\ \frac{A}{.5h} - b_2 &= b_1 \end{aligned}$$

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.

$$\begin{aligned} \frac{60}{.5(6)} - 12 &= \\ \frac{60}{6} - 12 &= b \\ 10 - 12 &= b \\ -2 &= b \end{aligned}$$

this doesn't make sense. you can't have a negative length

Score 3: The student made one computational error when multiplying 0.5 and 6.

Question 34

34 The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Express b_1 in terms of A , h , and b_2 .

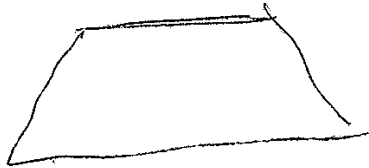
$$A - b_2 = b_1$$

$$A = \frac{1}{2}hb_1 + \frac{1}{2}hb_2$$

$$\frac{A - \frac{1}{2}hb_2}{\frac{1}{2}h} = \frac{\frac{1}{2}hb_1}{\frac{1}{2}h}$$

$$b_1 = A - b_2$$

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.



number of feet in other base = 24 ft.

$$60 = 3(12 + b)$$

$$60 = 36 + b$$

$$\begin{array}{r} -36 \\ -36 \end{array}$$

$$24 = b$$

Score 2: The student divided improperly when solving for b_1 and distributed the 3 improperly.

Question 34

34 The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Express b_1 in terms of A , h , and b_2 .

$$A = \frac{1}{2}h(b_1 + b_2)$$
$$\begin{array}{r} -b_2 \\ A - b_2 = \frac{1}{2}h(b_1) \end{array} \quad \frac{A - b_2}{\frac{1}{2}h} = b_1$$

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.

$$A = \frac{1}{2}h(b_1 + b_2)$$

$$60 = \frac{1}{2}(6)(12 + b_2)$$

$$3(12 + b_2)$$

$$\begin{array}{r} 60 = 36 + 3b \\ -36 \quad -36 \end{array}$$

$$\frac{24}{3} = \frac{3b}{3}$$

$$8 = b$$

The other base length is
8ft.

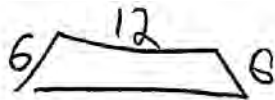
Score 2: The student made an error by subtracting b_2 rather than first using the distributive property.

Question 34

34 The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Express b_1 in terms of A , h , and b_2 .

$$A = \frac{1}{2}h(b_1 + b_2)$$

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.



$$\begin{aligned} 60 &= 3(12 + 8) \\ 60 &= 36 + 24 \\ 60 &= 60 \checkmark \end{aligned}$$



$$\begin{aligned} A &= \frac{1}{2}h(b_1 + b_2) \\ 60 &= \frac{1}{2}(6)(b_1 + b_2) \\ 60 &= 3(b_1 + b_2) \\ 60 &= 3(12 + b_2) \\ 60 &= 36 + 3b_2 \\ -36 &\quad -36 \\ \hline 24 &= 3b_2 \\ \frac{24}{3} &= \frac{3b_2}{3} \\ 8 &= b_2 \end{aligned}$$

Score 1: The student showed appropriate work to find 8, but showed no further correct work.

Question 34

34 The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Express b_1 in terms of A , h , and b_2 .

$$60 = \frac{1}{2} 6 (12 + b_2)$$

$$60 = 3(12 + b_2) \\ 60 = 36 + 24 \rightarrow 60 = 60$$

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.

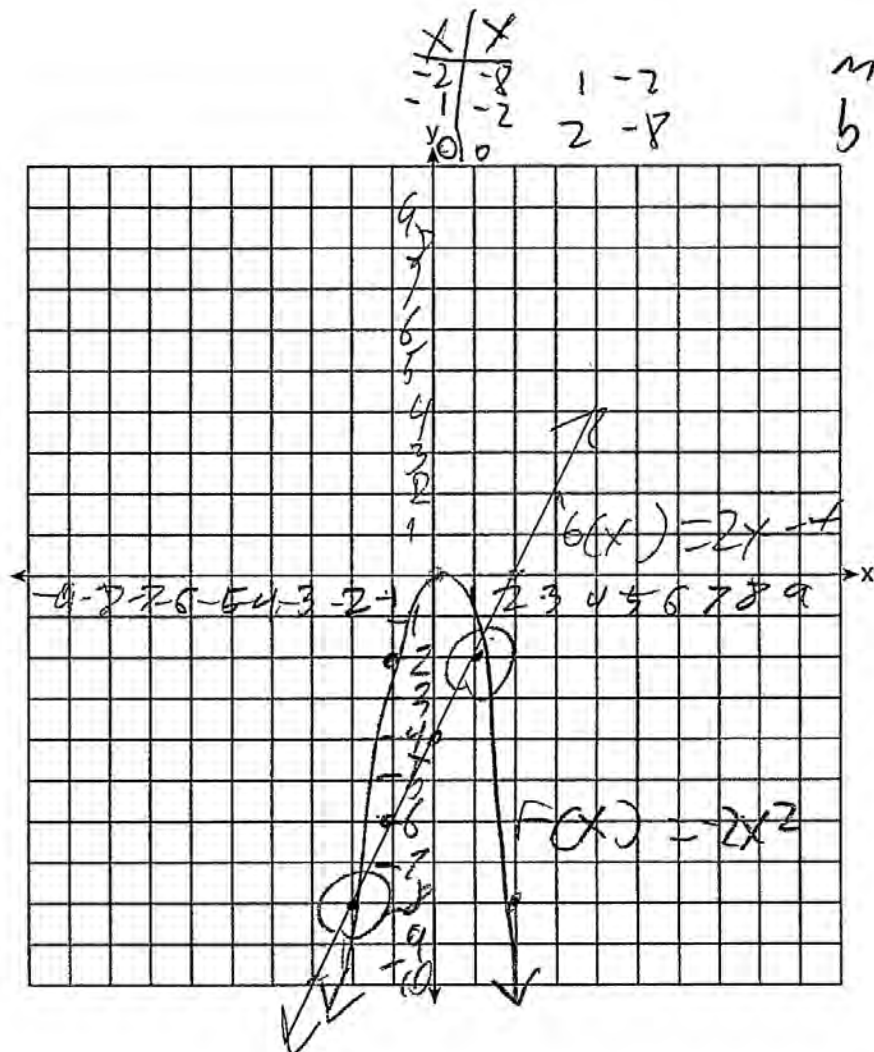
$$60 = \frac{1}{2} (12 + 24)$$

$$b_2 = 24$$

Score 0: The student has a completely incorrect response.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



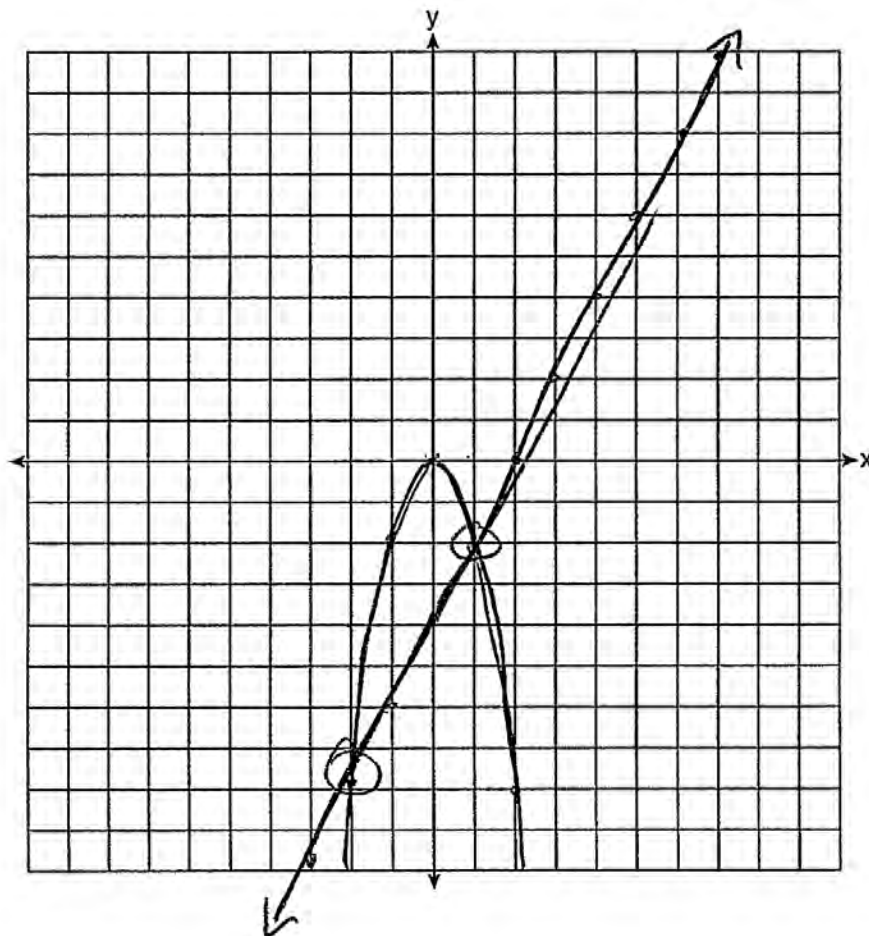
Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

-2, 1

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

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



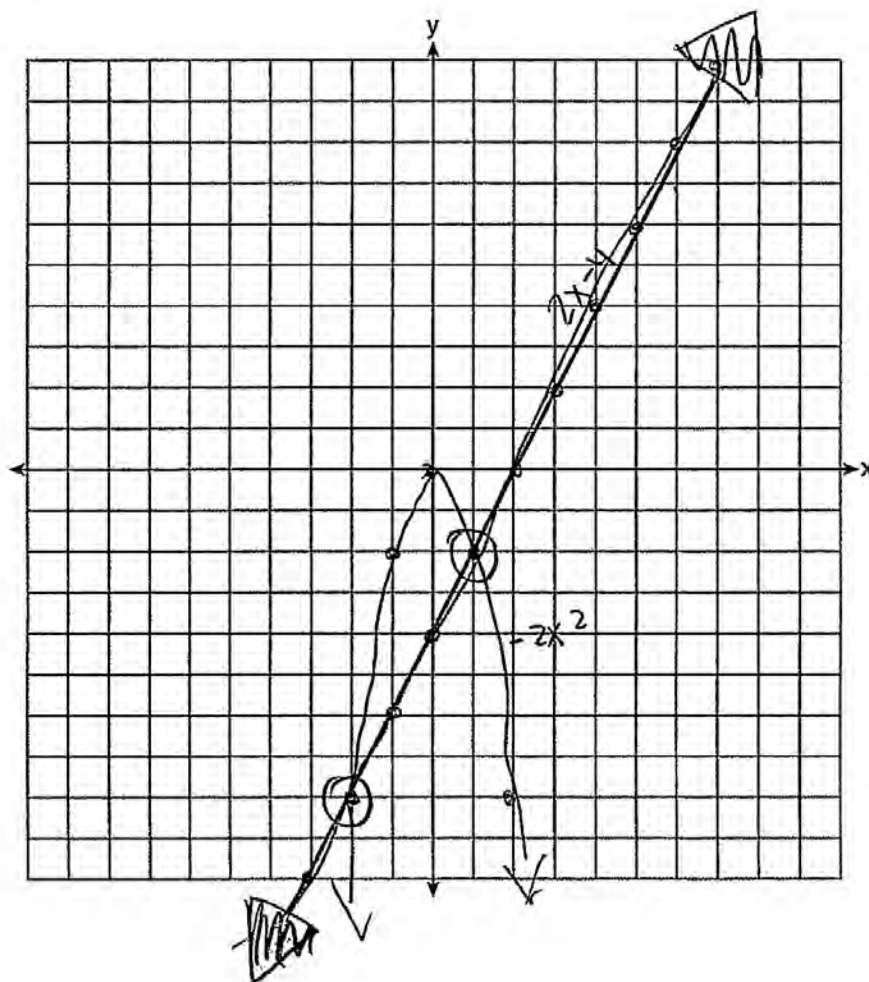
Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

$$x = 1 \quad x = -2$$

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

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

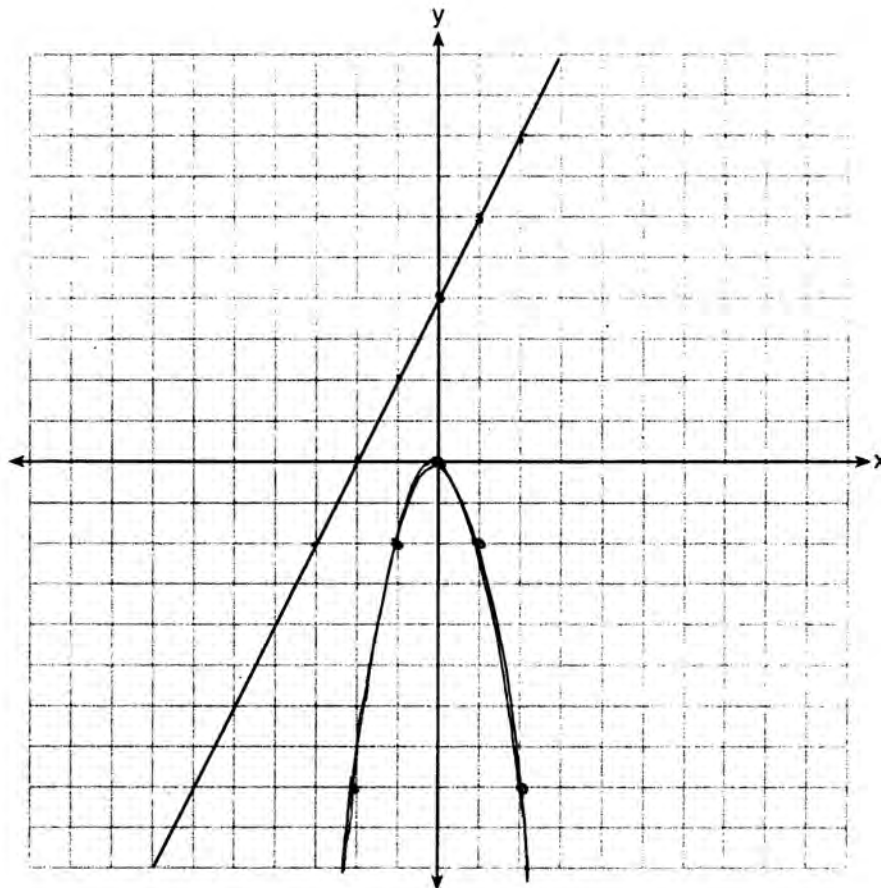
$$(1, -2)$$

$$(-2, -8)$$

Score 3: The student wrote the solution as coordinates.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



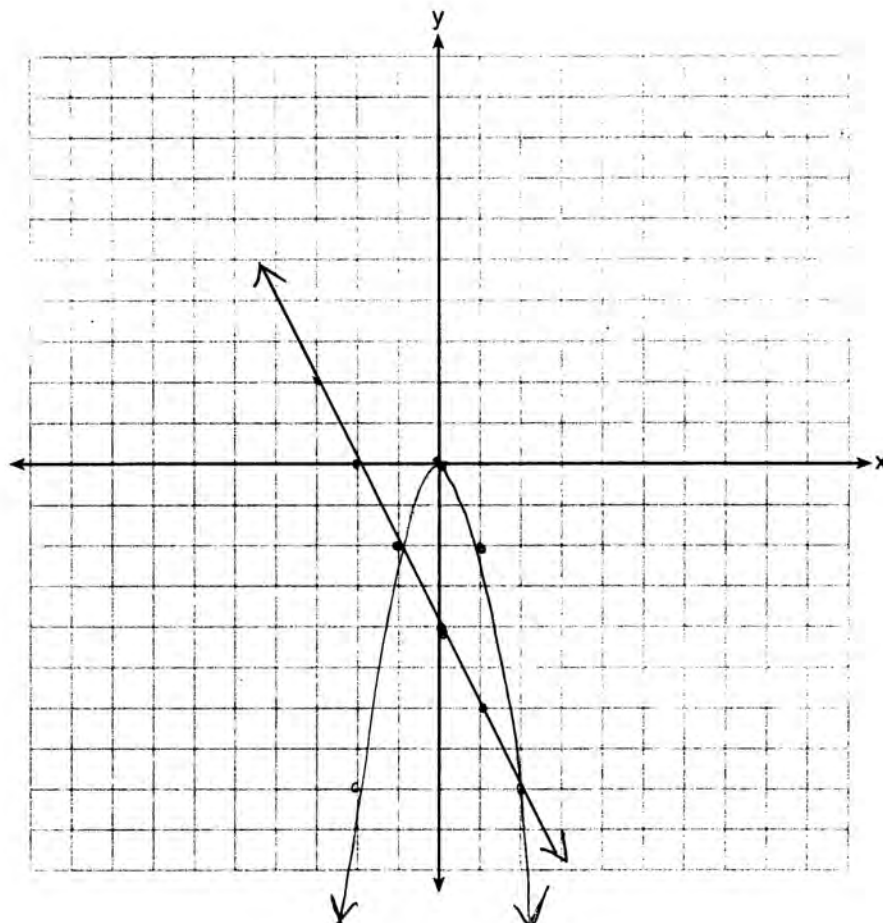
Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

There are no values of x

Score 3: The student made one graphing error by using +4 as the y -intercept. An appropriate response was stated.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



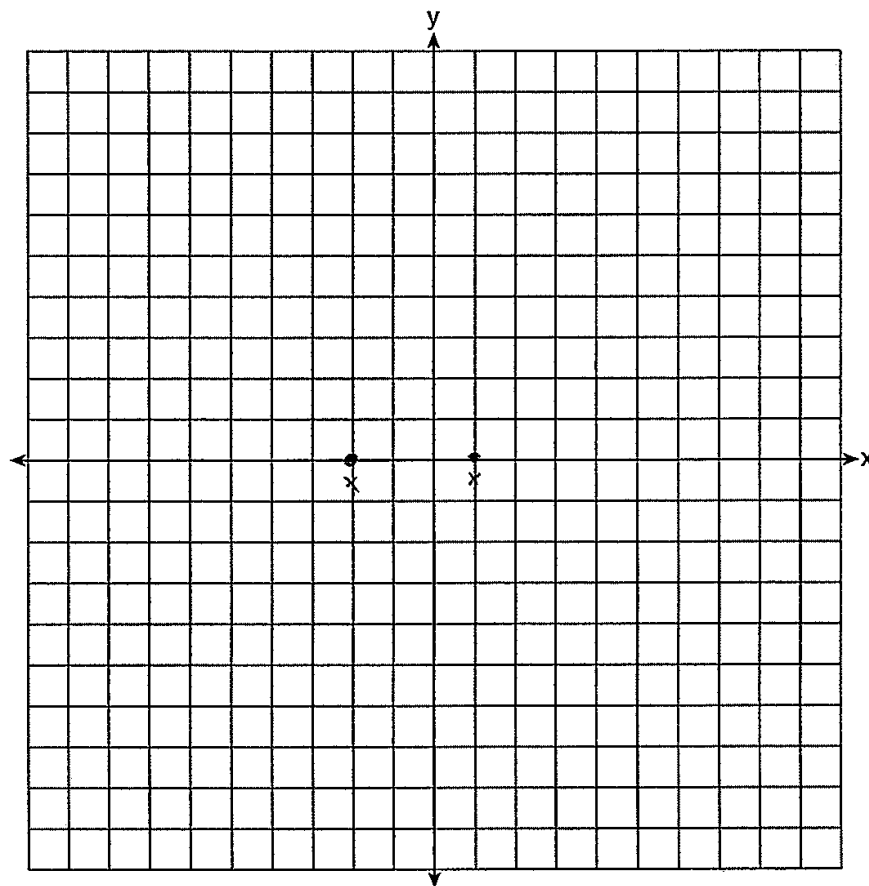
Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

-1 and 2

Score 3: The student made one graphing error by using the wrong slope. Appropriate values for x were stated.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



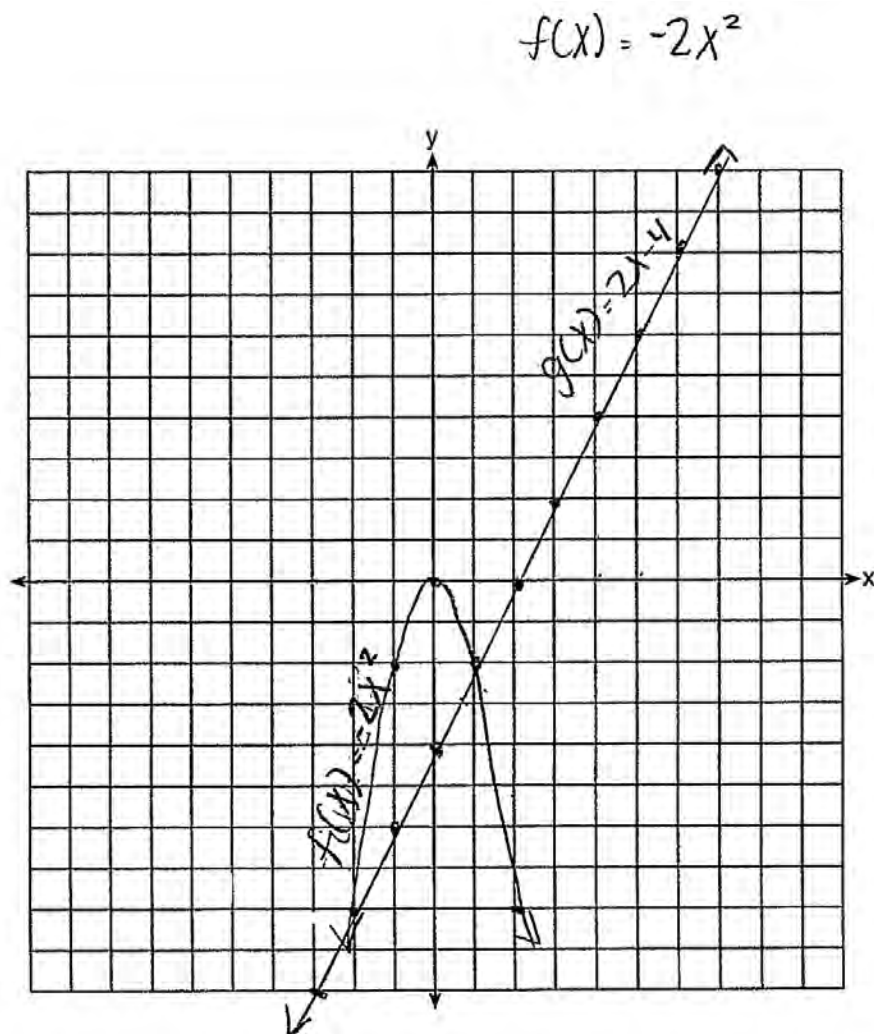
Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

$$\begin{aligned} -2x^2 &= 2x - 4 \\ -2x^2 - 2x + 4 &= 0 \\ 2x^2 + 2x - 4 &= 0 \end{aligned}$$
$$\begin{aligned} 2(x^2 + x - 2) &= 0 \\ 2(x - 1)(x + 2) &= 0 \\ \boxed{x = 1} \quad \boxed{x = -2} \end{aligned}$$

Score 2: The student used a method other than graphic to determine the x -values.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.

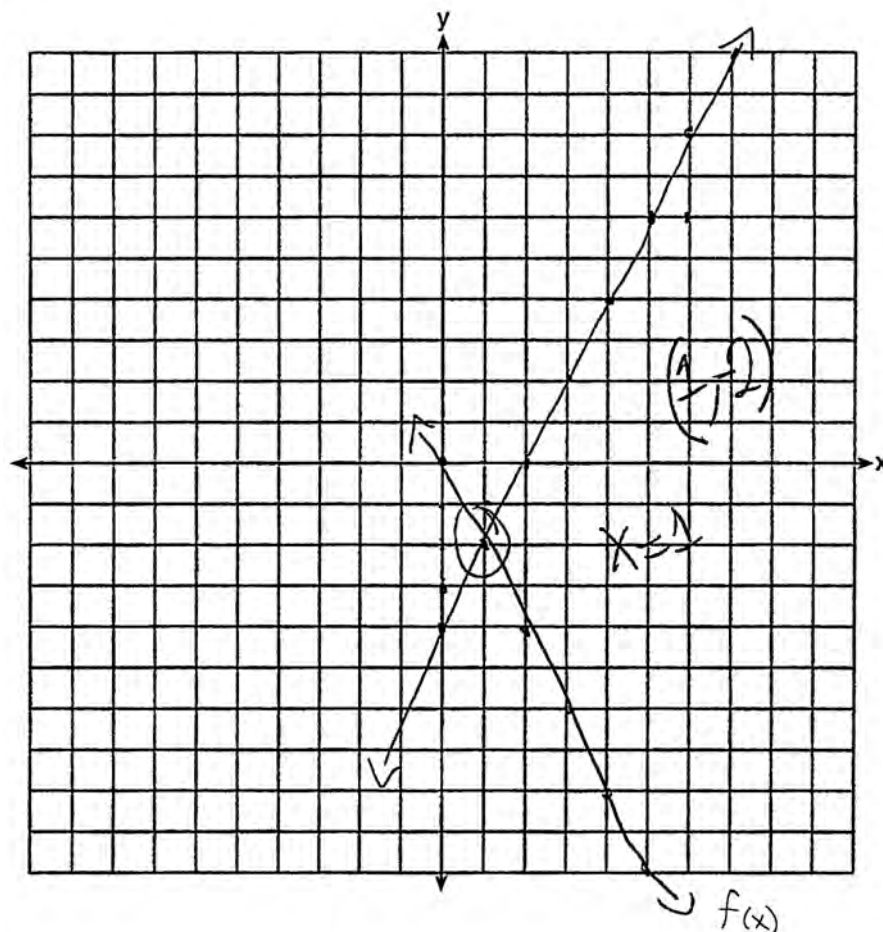


Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

Score 2: The student did not state the x -values.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.

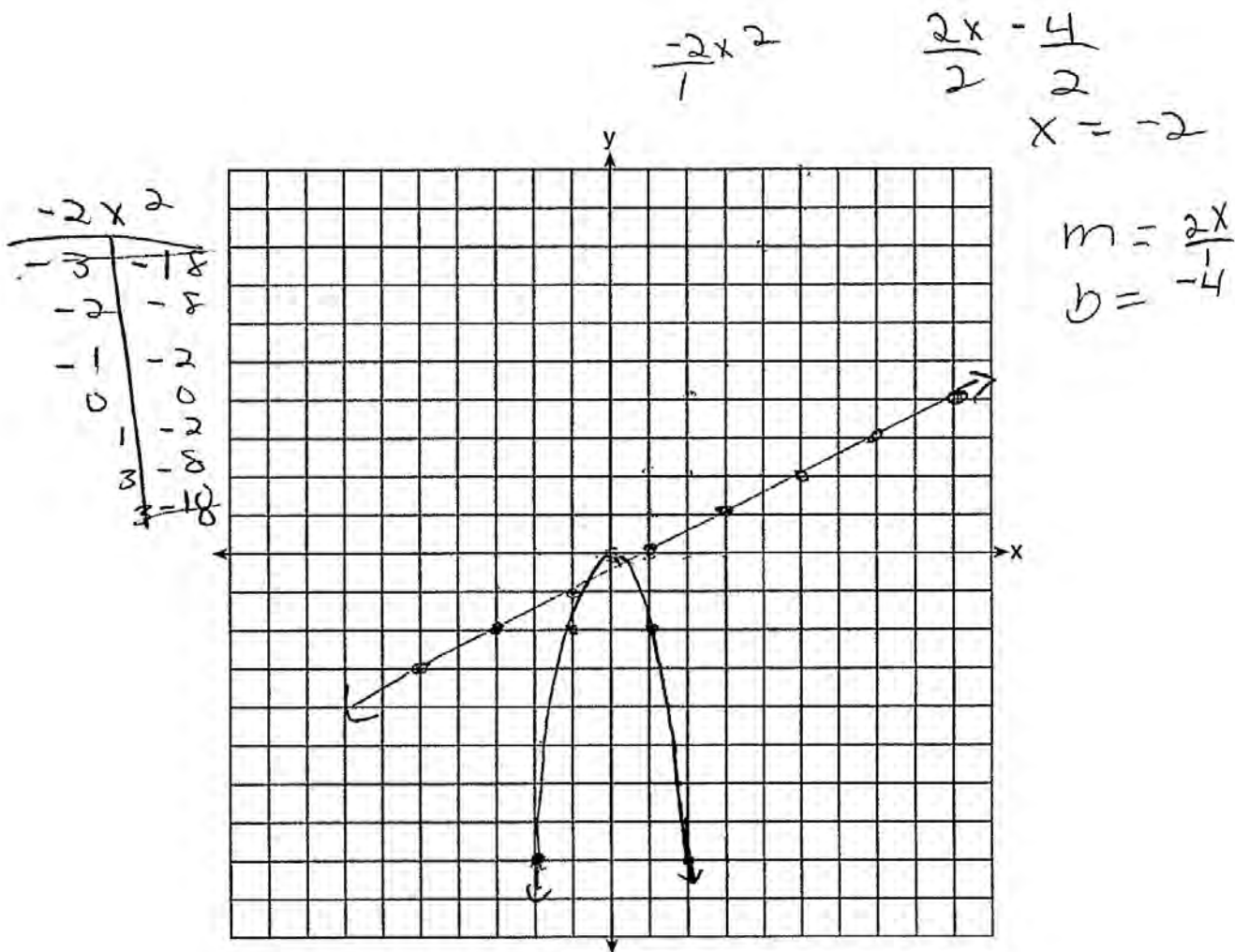


Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

Score 2: The student made a conceptual error by graphing $f(x) = -2x$ rather than $f(x) = -2x^2$, but graphed $g(x)$ correctly and found an appropriate x -value.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.

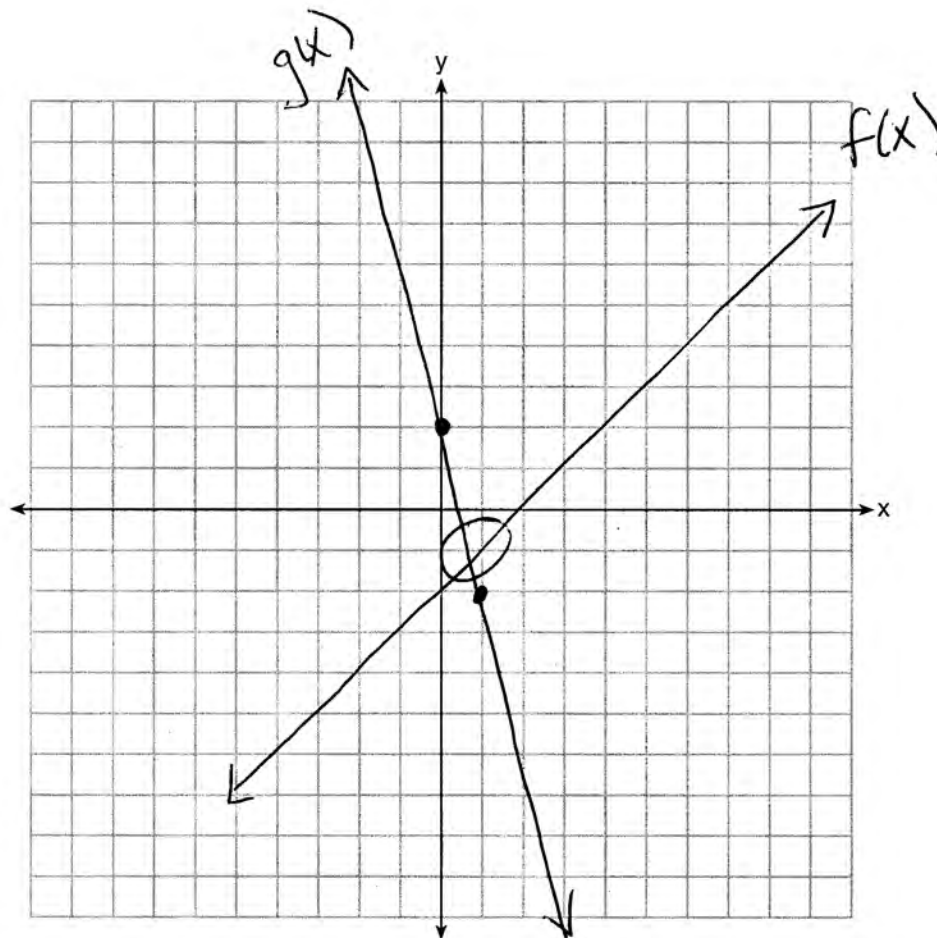


Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

Score 1: The student graphed $f(x)$ correctly, but showed no further correct work.

Question 35

35 Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.



Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

Score 0: The student's work is completely incorrect.

Question 36

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

$(60) \times (x+40) \rightarrow 60+40 = 100$

$A = 6000 y^2$

$$x(x+40) = 6000$$
$$x^2 + 40x = 6000$$
$$-6000 \quad -6000$$
$$x^2 + 40x - 6000 = 0$$

$(x + 100) \quad (x - 60)$

~~100~~

rejected

+60

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

Question 36

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

$$\begin{aligned} A &= L \cdot W \\ 6000 &= x(x+40) \\ 6000 &= x^2 + 40x \\ -6000 & \qquad \qquad \qquad -6000 \\ \hline 0 &= x^2 + 40x - 6000 \\ 0 &= (x-60)(x+100) \\ \begin{array}{l|l} x-60=0 & x+100=0 \\ \hline +60+60 & -100-100 \\ \hline x=60 & x=-100 \\ x+40=100 & \\ & =-60 \end{array} \end{aligned}$$

Score 3: The student made an error by not rejecting the negative solution.

Question 36

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

Let $x = \text{width}$
 $x + 40 = \text{length}$

$$A = l \cdot w$$

$$6000 = x(x + 40)$$

$$6000 = x^2 + 40x$$

$$\begin{array}{r} 6000 \\ -6000 \\ \hline \end{array} \quad \begin{array}{r} -6000 \\ -6000 \\ \hline \end{array}$$

$$\begin{array}{r} -6000 \\ 100 \times -60 \\ \hline 40 \end{array}$$

$$x^2 + 40x - 6000 = 0$$

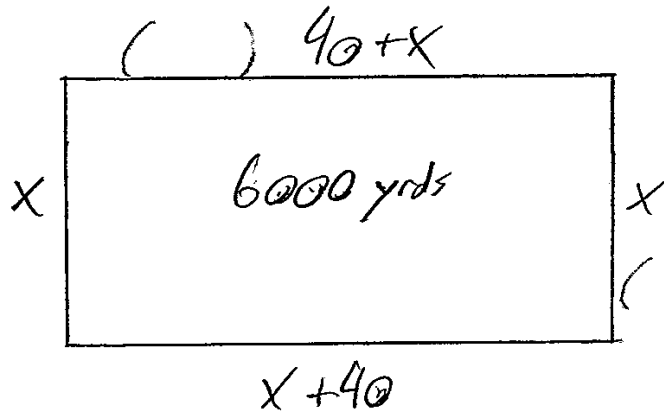
$$\begin{array}{r|l} (x+100) & (x-60) = 0 \\ \hline x+100=0 & x-60=0 \\ -100-100 & +60+60 \\ \hline x=-100 & x=60 \end{array}$$

$$\{-100, 60\}$$

Score 2: The student did appropriate work to find 60, but did not find the length and did not reject the negative root.

Question 36

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.



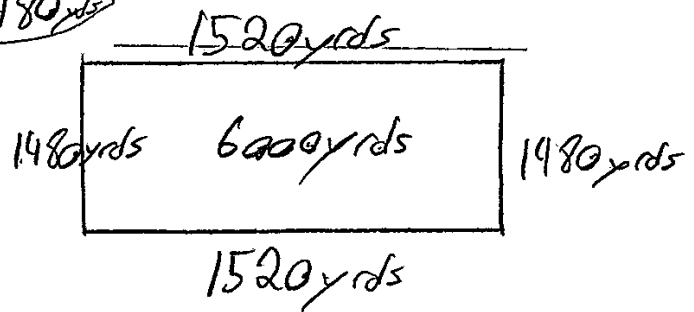
$$x + x + x + 40 + x + 40 = 6000$$

$$4x + \cancel{80} = 6000$$

$$\quad \quad \quad \underline{-80} \quad \quad \quad \underline{-80}$$

$$\frac{4x}{4} = \frac{5920}{4}$$

$$x = 1480 \text{ yds}$$



Score 2: The student made one conceptual error by using the perimeter rather than area formula.

Question 36

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

$$\begin{aligned}\text{width} &= x \\ \text{length} &= x + 40\end{aligned}$$

$$x(x+40) = 6000$$

$$\begin{aligned}x^2 + 40x &= 6000 \\ -6000 &- 6000\end{aligned}$$

$$\begin{aligned}x^2 + 40x - 6000 \\ (x + 100)(x - 60)\end{aligned}$$

Score 1: The student factored the trinomial correctly, but did not set the factors equal to zero. The student showed no further correct work.

Question 36

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

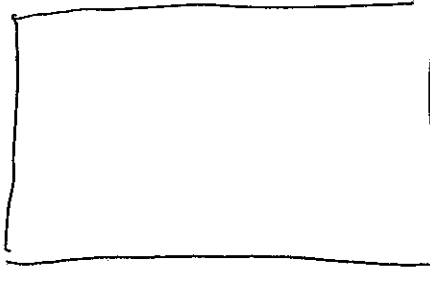
$$\begin{array}{l} \text{wide} \quad \text{long} \\ | \qquad | \\ x(40x) = 6000 \\ 40x^2 = 6000 \\ \sqrt{x^2} = \sqrt{150} \\ x = 12.25 \\ 40x = 490 \end{array}$$

Score 1: The student made an error in expressing the length, and then made a rounding error.

Question 36

36 A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

$A = 6000$
 $6000 = \cancel{w \cdot l} \quad \text{z.w.l}$
 $l = 40 + w$



$6000 = w \cdot (40 + w)$
 $6000 = w \cdot 40 + w$
 $\frac{6000}{40} = \frac{2w \cdot 40}{40}$
 $150 = 2w$
 $75 = w$

$40 \overline{) 6000}$
 $\underline{-40}$
 200
 $\underline{-200}$
 0

$w = 75$
 $l = 115$

$l = 40 + 75$
 $l = 115$

Score 0: The student wrote the equation $6000 = w(40 + w)$, but showed no further correct work.

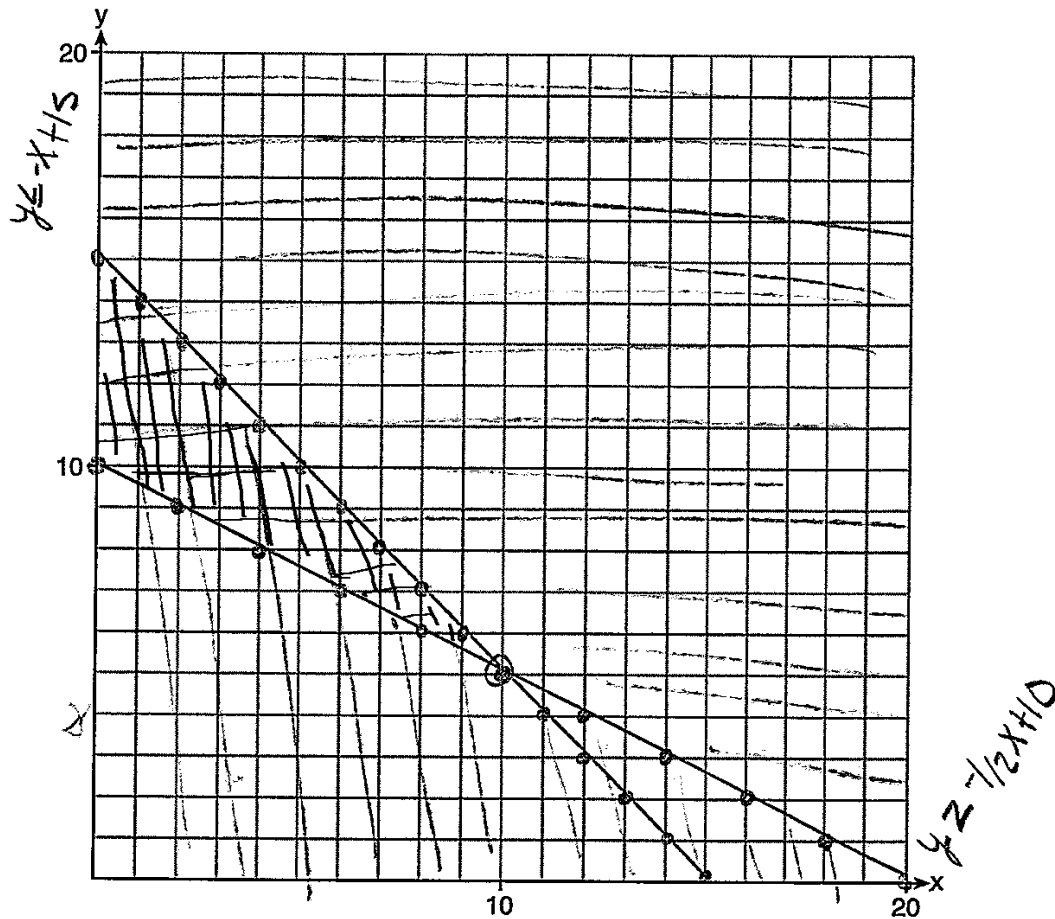
Question 37

37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

Write a system of inequalities that can be used to represent the situation.

$$y \leq -x + 15 \quad x + y \leq 15 \quad 4x + 8y \geq 80 \quad y \geq -\frac{1}{2}x + 10$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

baby lib
(10, 5)

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

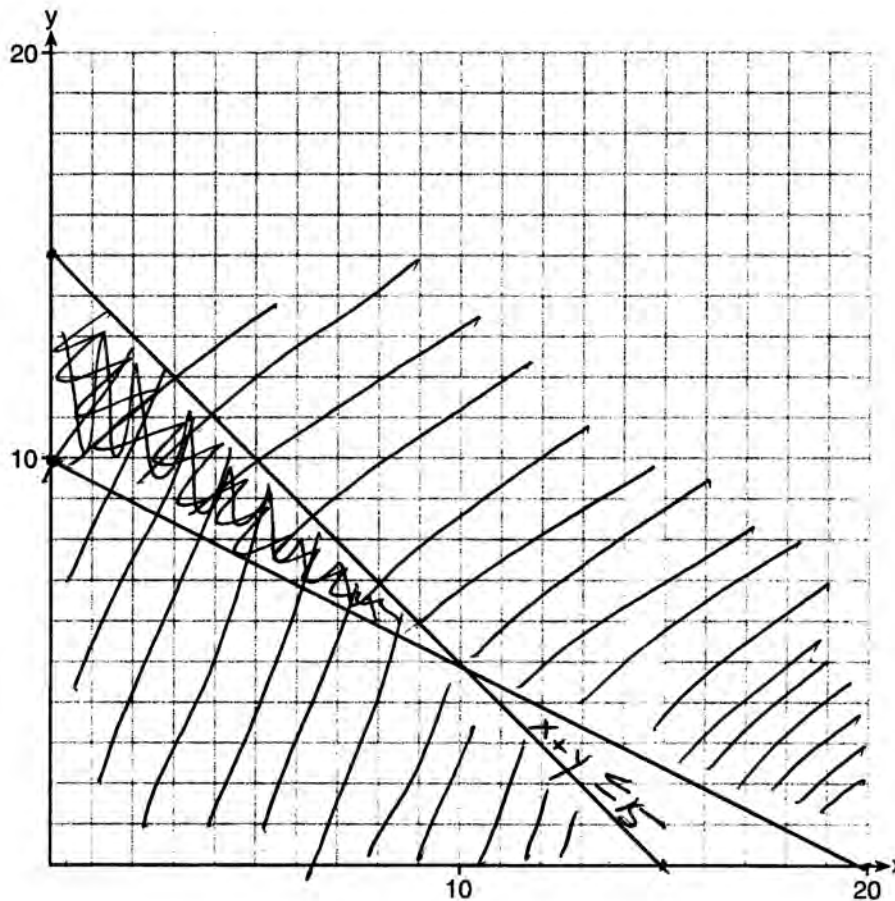
Question 37

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Write a system of inequalities that can be used to represent the situation.

$$x + y \leq 15 \qquad 4x + 8y \geq 80$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

2 and 12

Score 5: The student did not indicate which choice of hours corresponds with which job.

Question 37

37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

Write a system of inequalities that can be used to represent the situation.

$$x + y \leq 15$$

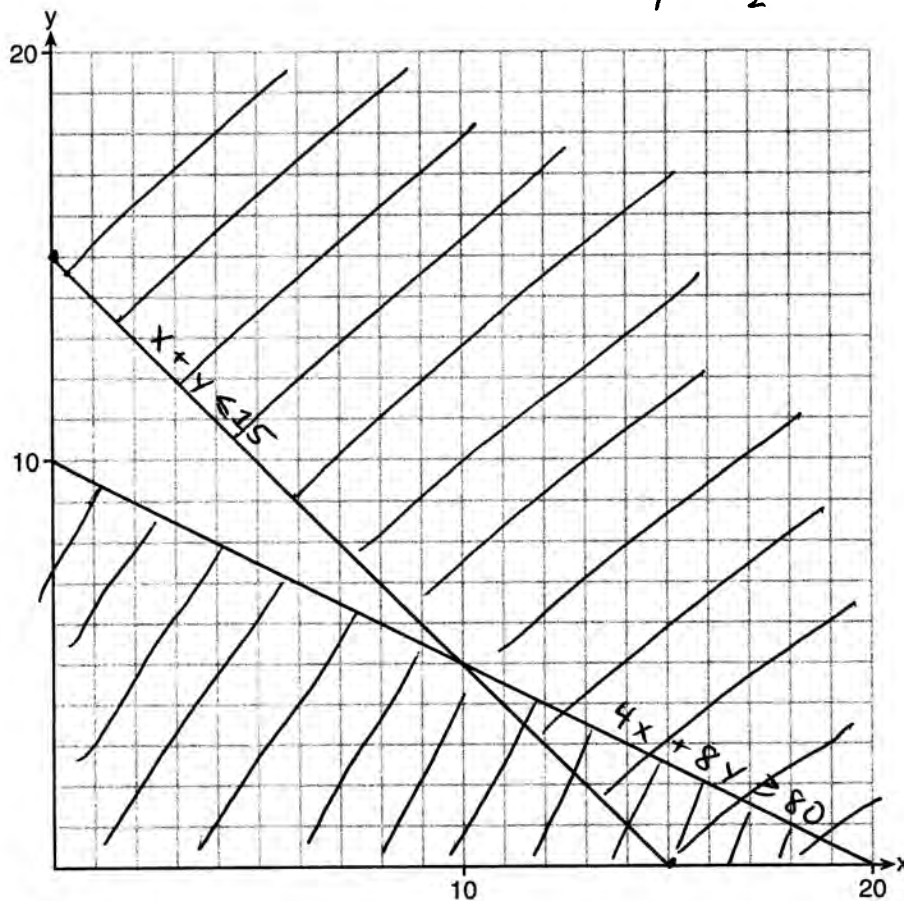
$$y \leq -x + 15$$

$$4x + 8y \geq 80$$

$$8y \geq -4x + 80$$

$$y \geq -\frac{1}{2}x + 10$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

$$4(4) = 16$$

$$10(8) = 80$$

$$96$$

Babysitting 4 hrs
Library 10 hrs

Score 5: The student made one graphing error by shading both lines in the wrong direction.

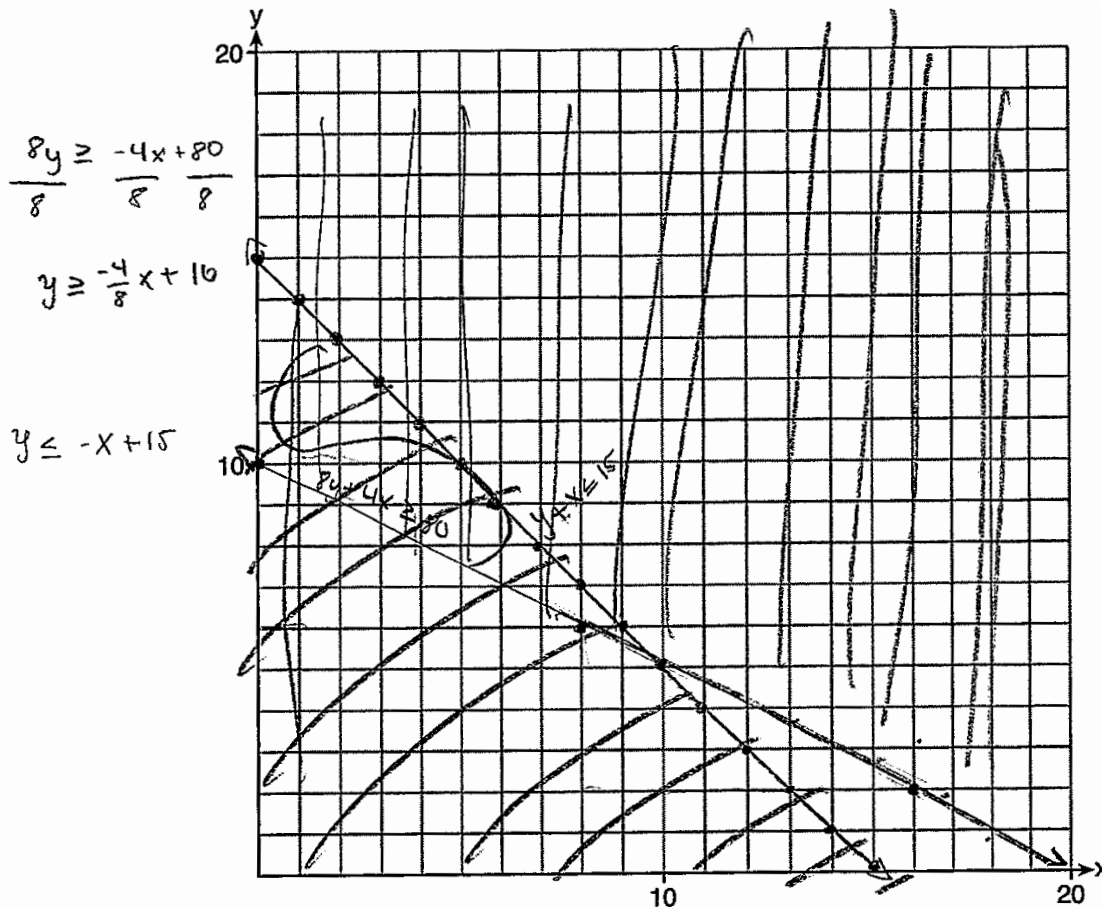
Question 37

37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

Write a system of inequalities that can be used to represent the situation.

$$8y + 4x \geq 80 \quad y + x \leq 15$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

$$(10, 3)$$

Score 5: The student stated an incorrect combination of hours.

Question 37

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Write a system of inequalities that can be used to represent the situation.

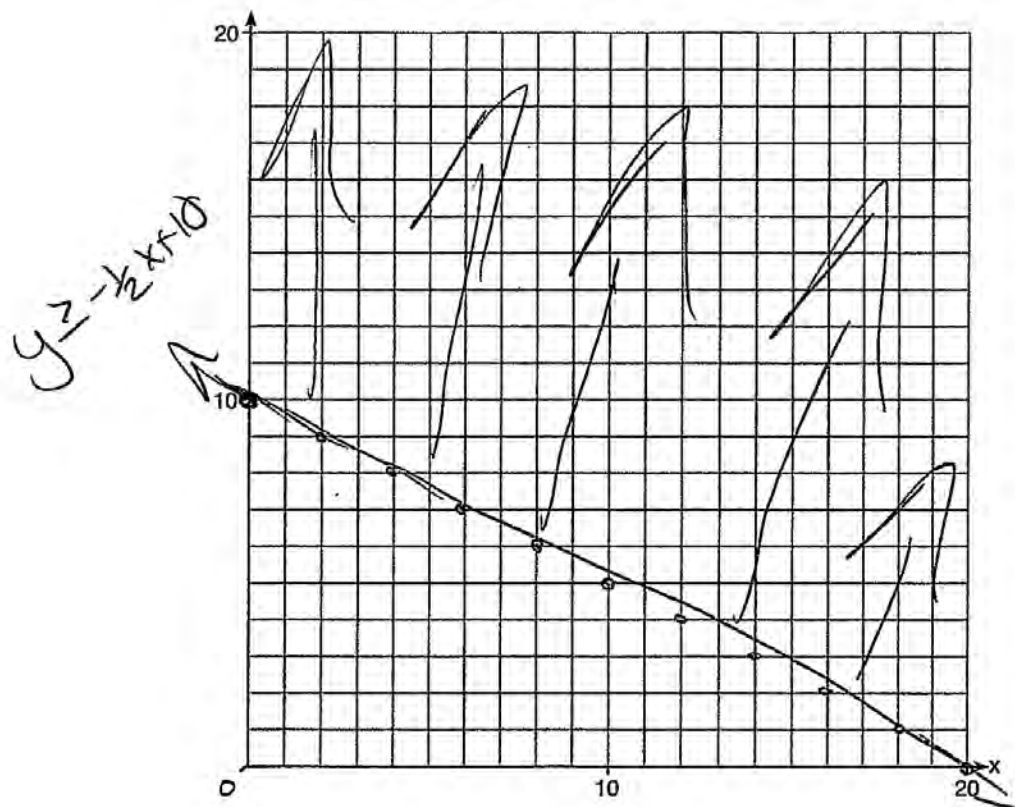
$$\frac{8y}{8} \geq \frac{4x + 80}{8}$$

$$y \geq -\frac{1}{2}x + 10$$

$$x + y \leq 15$$

$$8y + 4x \geq 80$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

$$8(8) + 4(5)$$

$$64 \quad 20$$

$$84$$

library assistant - 8 hours
 babysit - 5 hours

Score 4: The student stated both inequalities and a correct combination of hours, but did not graph both inequalities.

Question 37

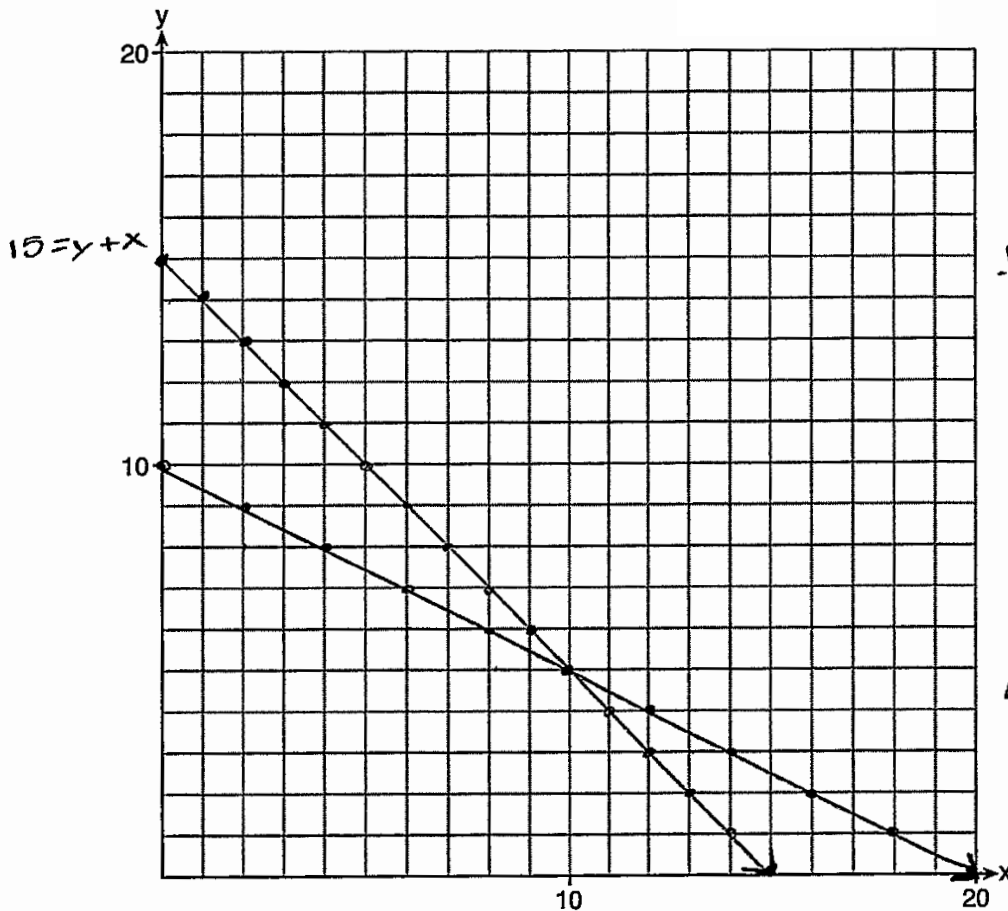
37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

Write a system of inequalities that can be used to represent the situation.

$$\begin{aligned} 80 &= 8y + 4x \\ 15 &= y + x \end{aligned}$$

$$\begin{aligned} 80 &= 8y + 4x \\ -4x & \quad -4x \\ \hline \frac{8y}{8} &= \frac{80 - 4x}{8} \\ y &= 10 - \frac{1}{2}x \end{aligned}$$

Graph these inequalities on the set of axes below.



$$\begin{aligned} 15 &= y + x \\ -y & \quad -y \\ \hline 15 - y &= x, 15 \\ -15 & \\ \hline y &= -x + 15 \end{aligned}$$

$$4 \cdot$$

$$8 \cdot 5$$

$$8 \cdot 5 = 40$$

$$\begin{array}{r} 4 \cdot 10 = 40 \\ + \\ 80 \end{array}$$

Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

5 hours at the library and ten hours babysitting

Score 4: The student made one conceptual error in expressing inequalities as equations.

Question 37

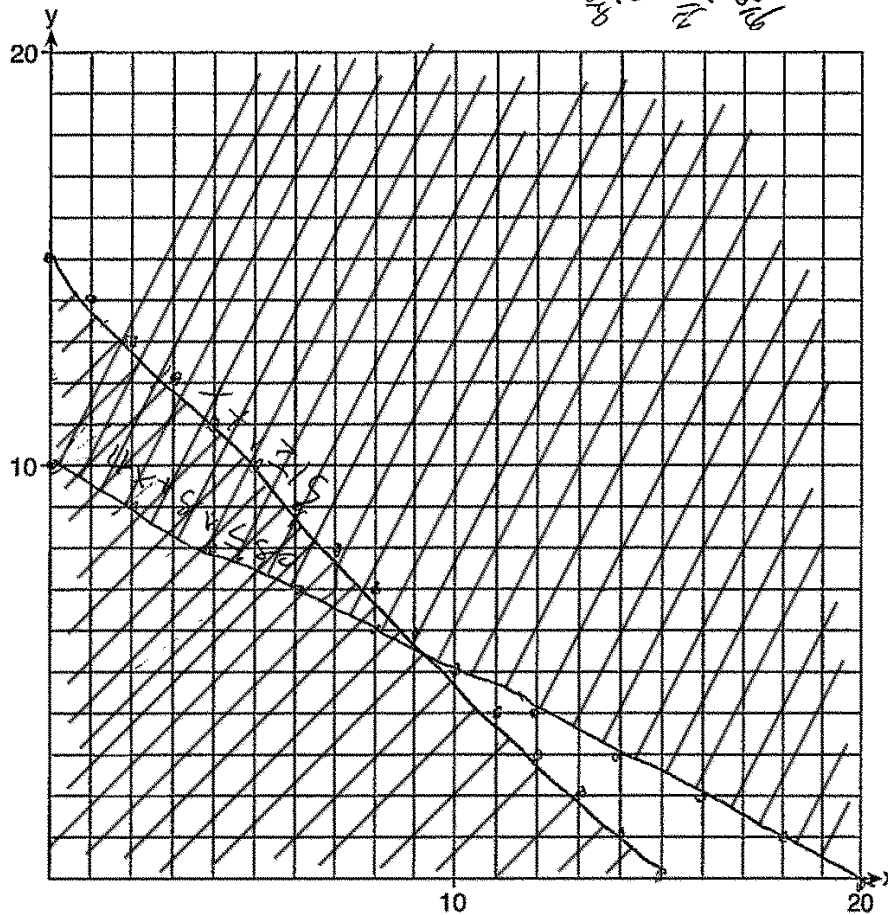
37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

Write a system of inequalities that can be used to represent the situation.

$$4x + 8y \leq 80$$

$$x + y \geq 15$$

Graph these inequalities on the set of axes below.



$$x + y \geq 15$$

$$-x$$

$$y \geq -x + 15$$

Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

If she works 1 hour as a library assistant and 2 hours as a babysitter.

Score 3: The student made a conceptual error by writing both inequalities with an incorrect symbol. The student made a graphing error based on the system written. The student stated a correct combination of hours.

Question 37

37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs. let $x = \#$ of hrs baby
 $y = \#$ of hrs @ library

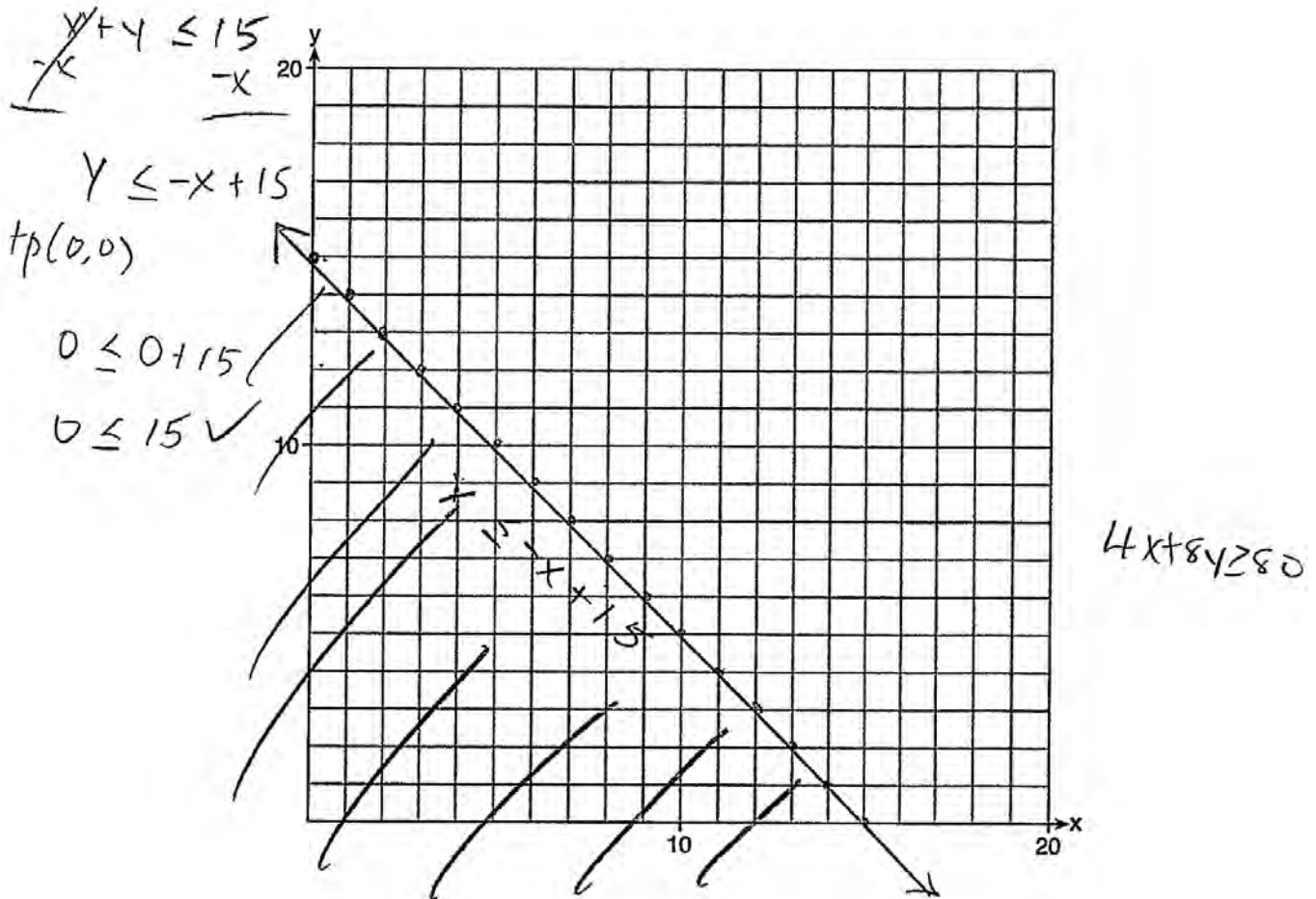
Write a system of inequalities that can be used to represent the situation.

$$\begin{aligned} 4(x + y) &\leq 60 \\ 4x + 8y &\geq 80 \end{aligned}$$

$$\begin{aligned} -4x - 4y &\geq -60 \\ 4x + 8y &\geq 80 \end{aligned}$$

$$\frac{4y}{4} \geq \frac{20}{4}$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

Score 3: The student stated both inequalities correctly but only graphed, shaded, and labeled one correctly. A combination of hours was not stated.

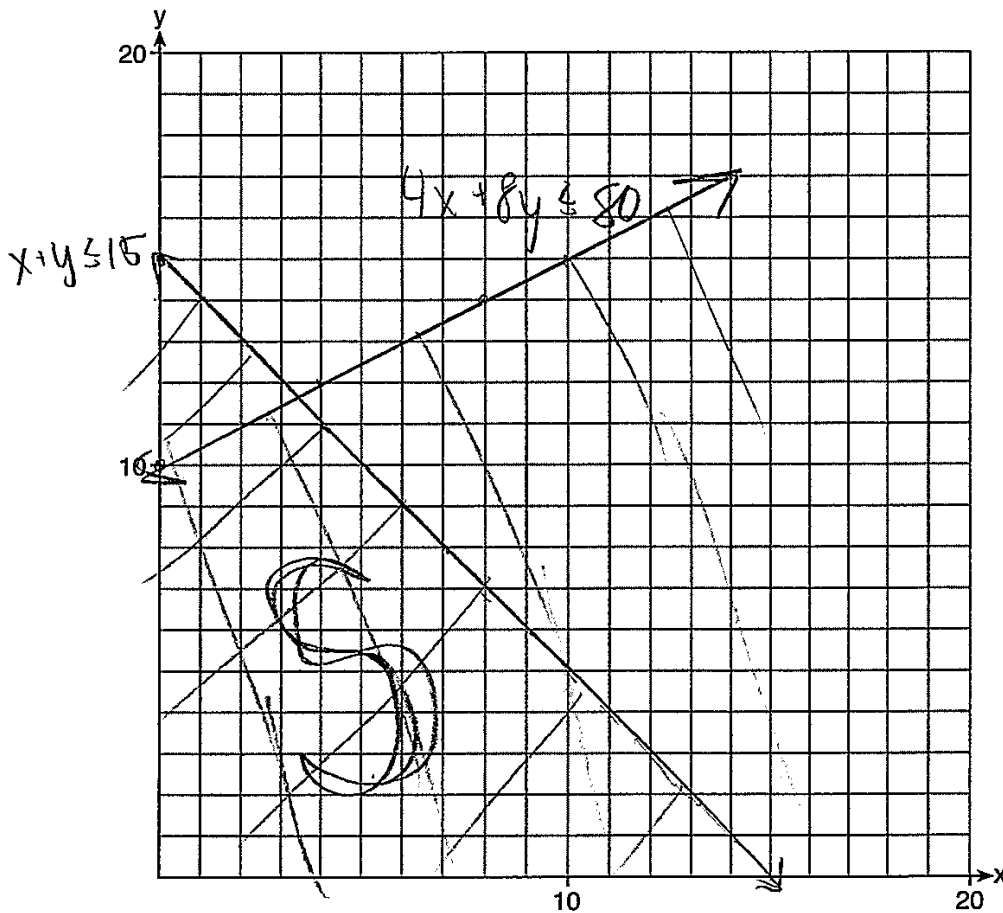
Question 37

37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

Write a system of inequalities that can be used to represent the situation.

$$x + y \leq 15 \quad 4x + 8y \leq 80 \quad y \leq \frac{1}{2}x + 10$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

$$x = 2 \\ y = 3$$

Score 3: The student wrote only one inequality correctly, graphed it correctly, and stated and labeled an appropriate combination of hours based on the graph.

Question 37

37 Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs.

babysits hours x @ \$4 an hour
 library hours = y @ \$8 an hour
 no more than 15 hours
 at least \$80

Write a system of inequalities that can be used to represent the situation.

$y \geq -\frac{1}{2}x + 10$

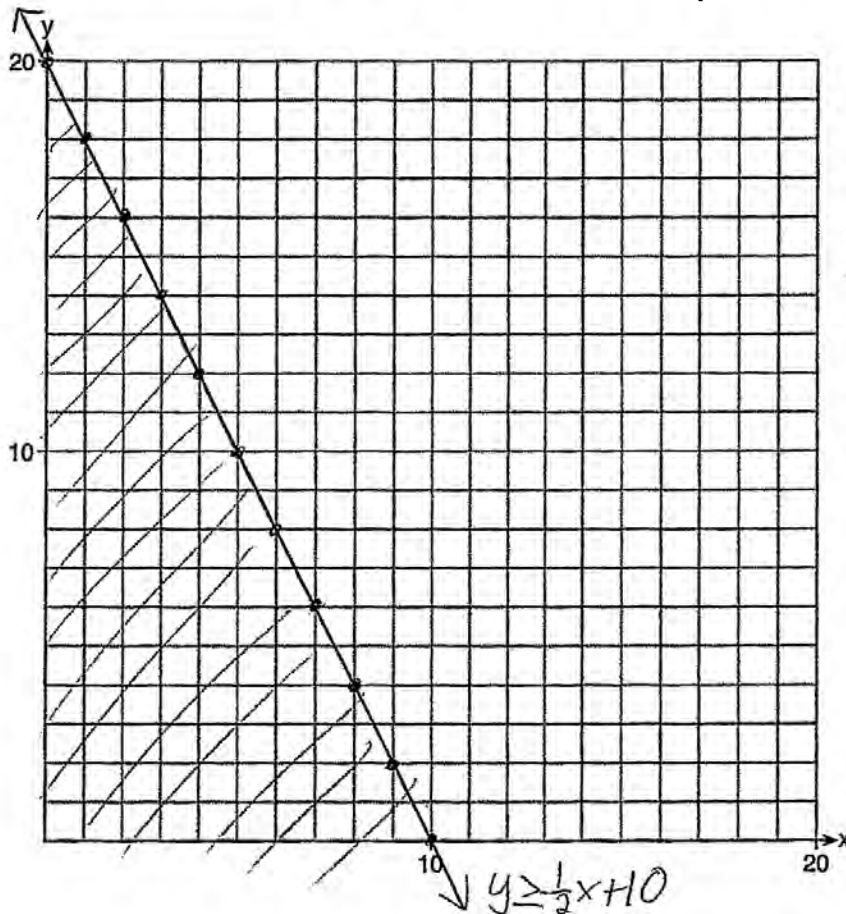
~~$x + y \leq 15$~~

~~$4x + 8y \geq 80$~~

Graph these inequalities on the set of axes below.

~~$4x + 8y \geq 80$~~
 ~~$4x$~~
 $8y \geq -4x + 80$

$y \geq \frac{1}{2}x + 10$



x	y
-6	13
-4	12
-2	11
0	10
2	9
4	8
6	7

Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

10 hours in the library & 5 hours babysitting = \$100

Score 2: The student wrote one inequality correctly and stated a correct combination of hours.

Question 37

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Write a system of inequalities that can be used to represent the situation.

$$4x + 8y = 80$$

$$x + y = 15$$

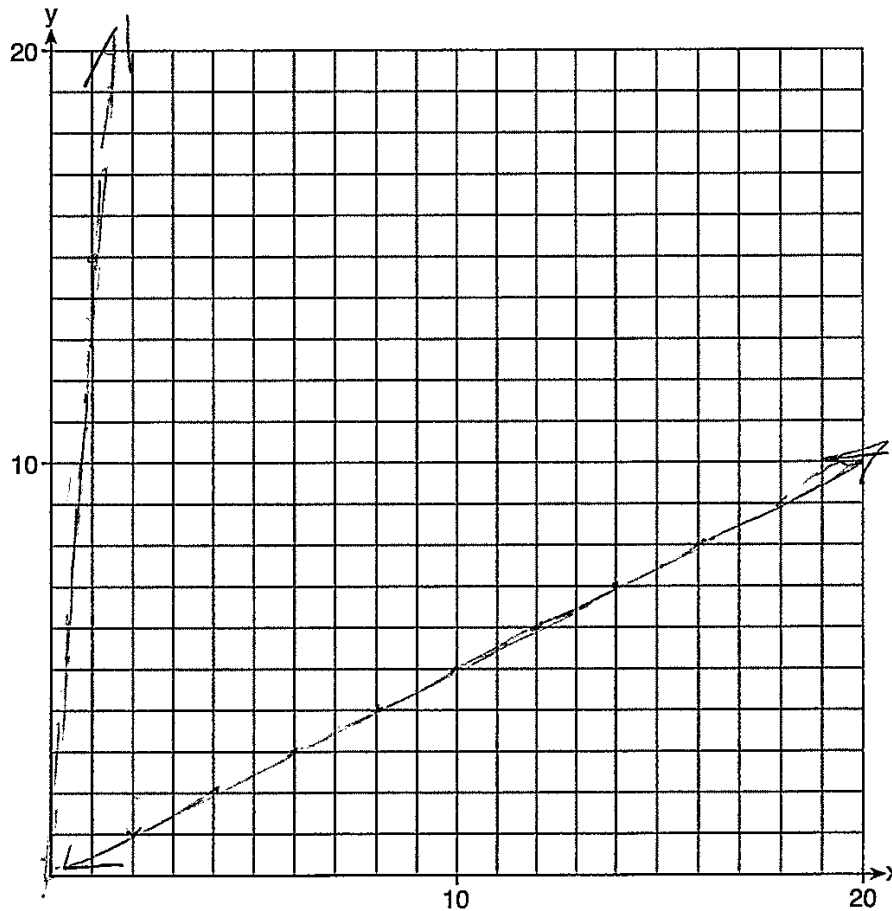
$$4x + 8y = 80$$

$$= -4x$$

$$\frac{8y}{8} = \frac{80 - 4x}{8}$$

$$y = 10 - \frac{1}{2}x$$

Graph these inequalities on the set of axes below.



$$y = -\frac{1}{2}x + 10$$

rejected

$$y = \frac{1}{2}x + 10$$

Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

Score 1: The student stated two correct equations, but showed no further correct work.

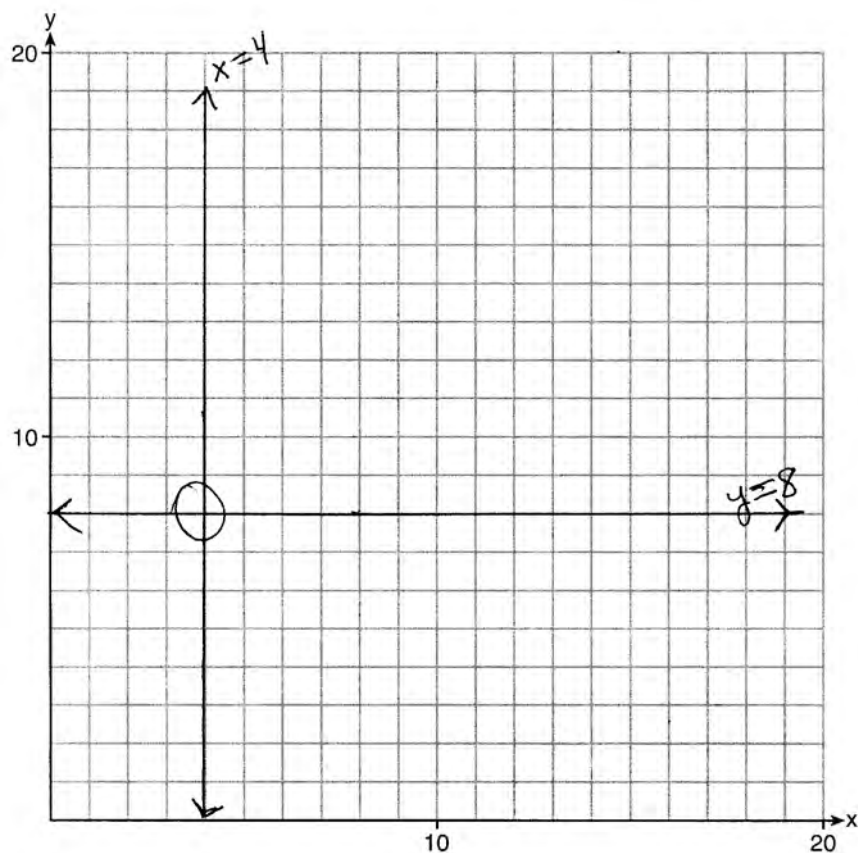
Question 37

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Write a system of inequalities that can be used to represent the situation.

$$x = 4 \quad \text{and} \quad y = 8$$

Graph these inequalities on the set of axes below.



Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

Score 0: The student has a completely incorrect response.

Regents Examination in Algebra I (Common Core) – August 2014

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

(Use for the August 2014 exam only.)

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