

**ALGEBRA I****Tuesday, June 12, 2018 — 1:15 to 4:15 p.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]

Use this space for computations.

1 The solution to $4p + 2 < 2(p + 5)$ is

- (1) $p > -6$ (3) $p > 4$
(2) $p < -6$ (4) $p < 4$

2 If $k(x) = 2x^2 - 3\sqrt{x}$, then $k(9)$ is

- (1) 315 (3) 159
(2) 307 (4) 153

3 The expression $3(x^2 + 2x - 3) - 4(4x^2 - 7x + 5)$ is equivalent to

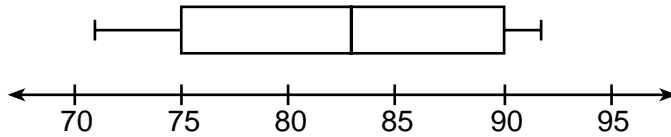
- (1) $-13x - 22x + 11$ (3) $19x^2 - 22x + 11$
(2) $-13x^2 + 34x - 29$ (4) $19x^2 + 34x - 29$

4 The zeros of the function $p(x) = x^2 - 2x - 24$ are

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

Use this space for computations.

- 5 The box plot below summarizes the data for the average monthly high temperatures in degrees Fahrenheit for Orlando, Florida.



The third quartile is

- (1) 92 (3) 83
(2) 90 (4) 71
- 6 Joy wants to buy strawberries and raspberries to bring to a party. Strawberries cost \$1.60 per pound and raspberries cost \$1.75 per pound. If she only has \$10 to spend on berries, which inequality represents the situation where she buys x pounds of strawberries and y pounds of raspberries?
- (1) $1.60x + 1.75y \leq 10$ (3) $1.75x + 1.60y \leq 10$
(2) $1.60x + 1.75y \geq 10$ (4) $1.75x + 1.60y \geq 10$
- 7 On the main floor of the Kodak Hall at the Eastman Theater, the number of seats per row increases at a constant rate. Steven counts 31 seats in row 3 and 37 seats in row 6. How many seats are there in row 20?
- (1) 65 (3) 69
(2) 67 (4) 71
- 8 Which ordered pair below is *not* a solution to $f(x) = x^2 - 3x + 4$?
- (1) (0,4) (3) (5,14)
(2) (1.5,1.75) (4) (-1,6)

**Use this space for
computations.**

- 9 Students were asked to name their favorite sport from a list of basketball, soccer, or tennis. The results are shown in the table below.

	Basketball	Soccer	Tennis
Girls	42	58	20
Boys	84	41	5

What percentage of the students chose soccer as their favorite sport?

- (1) 39.6% (3) 50.4%
(2) 41.4% (4) 58.6%
- 10 The trinomial $x^2 - 14x + 49$ can be expressed as
(1) $(x - 7)^2$ (3) $(x - 7)(x + 7)$
(2) $(x + 7)^2$ (4) $(x - 7)(x + 2)$
- 11 A function is defined as $\{(0,1), (2,3), (5,8), (7,2)\}$. Isaac is asked to create one more ordered pair for the function. Which ordered pair can he add to the set to keep it a function?
(1) $(0,2)$ (3) $(7,0)$
(2) $(5,3)$ (4) $(1,3)$
- 12 The quadratic equation $x^2 - 6x = 12$ is rewritten in the form $(x + p)^2 = q$, where q is a constant. What is the value of p ?
(1) -12 (3) -3
(2) -9 (4) 9

Use this space for
computations.

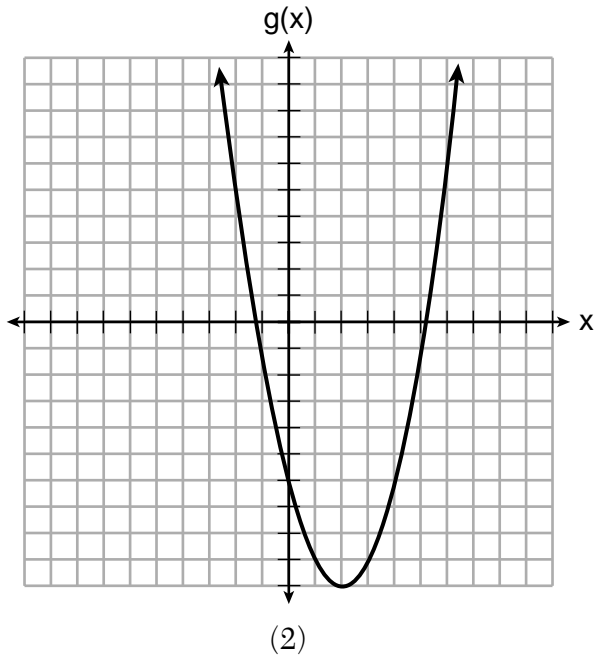
13 Which of the quadratic functions below has the *smallest* minimum value?

$$h(x) = x^2 + 2x - 6$$

(1)

$$k(x) = (x + 5)(x + 2)$$

(3)



x	f(x)
-1	-2
0	-5
1	-6
2	-5
3	-2

(4)

14 Which situation is *not* a linear function?

- (1) A gym charges a membership fee of \$10.00 down and \$10.00 per month.
- (2) A cab company charges \$2.50 initially and \$3.00 per mile.
- (3) A restaurant employee earns \$12.50 per hour.
- (4) A \$12,000 car depreciates 15% per year.

**Use this space for
computations.**

15 The Utica Boilermaker is a 15-kilometer road race. Sara is signed up to run this race and has done the following training runs:

- I. 10 miles
- II. 44,880 feet
- III. 15,560 yards

Which run(s) are at least 15 kilometers?

- (1) I, only
- (2) II, only
- (3) I and III
- (4) II and III

16 If $f(x) = x^2 + 2$, which interval describes the range of this function?

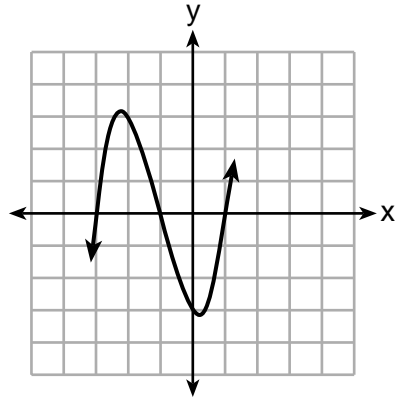
- (1) $(-\infty, \infty)$
- (2) $[0, \infty)$
- (3) $[2, \infty)$
- (4) $(-\infty, 2]$

17 The amount Mike gets paid weekly can be represented by the expression $2.50a + 290$, where a is the number of cell phone accessories he sells that week. What is the constant term in this expression and what does it represent?

- (1) $2.50a$, the amount he is guaranteed to be paid each week
- (2) $2.50a$, the amount he earns when he sells a accessories
- (3) 290, the amount he is guaranteed to be paid each week
- (4) 290, the amount he earns when he sells a accessories

18 A cubic function is graphed on the set of axes below.

Use this space for
computations.



Which function could represent this graph?

(1) $f(x) = (x - 3)(x - 1)(x + 1)$

(2) $g(x) = (x + 3)(x + 1)(x - 1)$

(3) $h(x) = (x - 3)(x - 1)(x + 3)$

(4) $k(x) = (x + 3)(x + 1)(x - 3)$

Use this space for
computations.

19 Mrs. Allard asked her students to identify which of the polynomials below are in standard form and explain why.

I. $15x^4 - 6x + 3x^2 - 1$

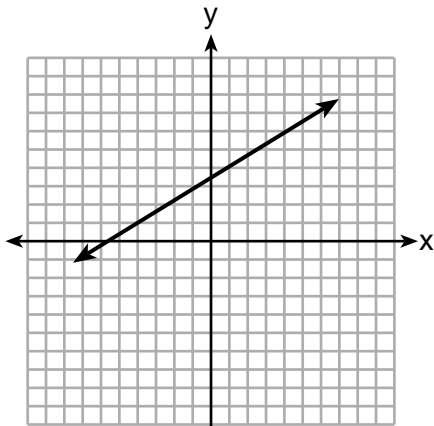
II. $12x^3 + 8x + 4$

III. $2x^5 + 8x^2 + 10x$

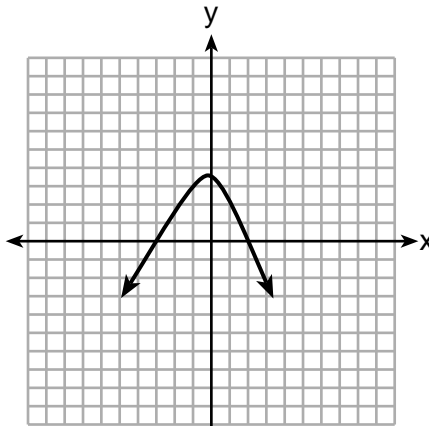
Which student's response is correct?

- (1) Tyler said I and II because the coefficients are decreasing.
- (2) Susan said only II because all the numbers are decreasing.
- (3) Fred said II and III because the exponents are decreasing.
- (4) Alyssa said II and III because they each have three terms.

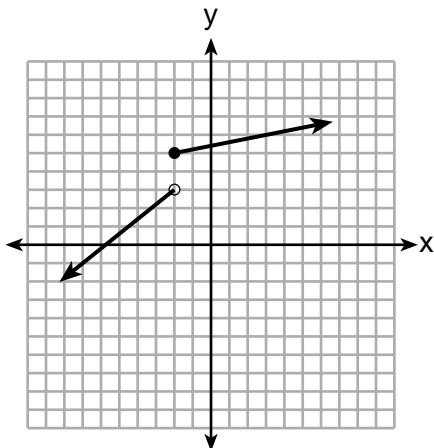
20 Which graph does *not* represent a function that is always increasing over the entire interval $-2 < x < 2$?



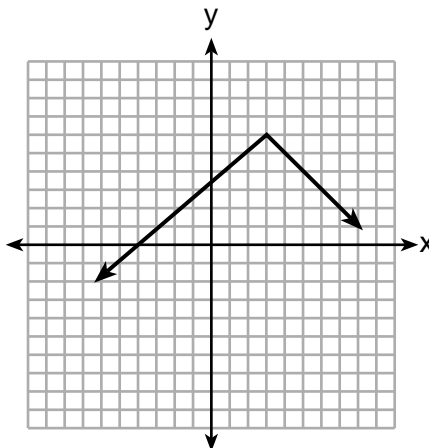
(1)



(3)



(2)



(4)

**Use this space for
computations.**

21 At an ice cream shop, the profit, $P(c)$, is modeled by the function $P(c) = 0.87c$, where c represents the number of ice cream cones sold. An appropriate domain for this function is

- (1) an integer ≤ 0 (3) a rational number ≤ 0
(2) an integer ≥ 0 (4) a rational number ≥ 0

22 How many real-number solutions does $4x^2 + 2x + 5 = 0$ have?

- (1) one (3) zero
(2) two (4) infinitely many

23 Students were asked to write a formula for the length of a rectangle by using the formula for its perimeter, $p = 2\ell + 2w$. Three of their responses are shown below.

I. $\ell = \frac{1}{2}p - w$

II. $\ell = \frac{1}{2}(p - 2w)$

III. $\ell = \frac{p - 2w}{2}$

Which responses are correct?

- (1) I and II, only (3) I and III, only
(2) II and III, only (4) I, II, and III

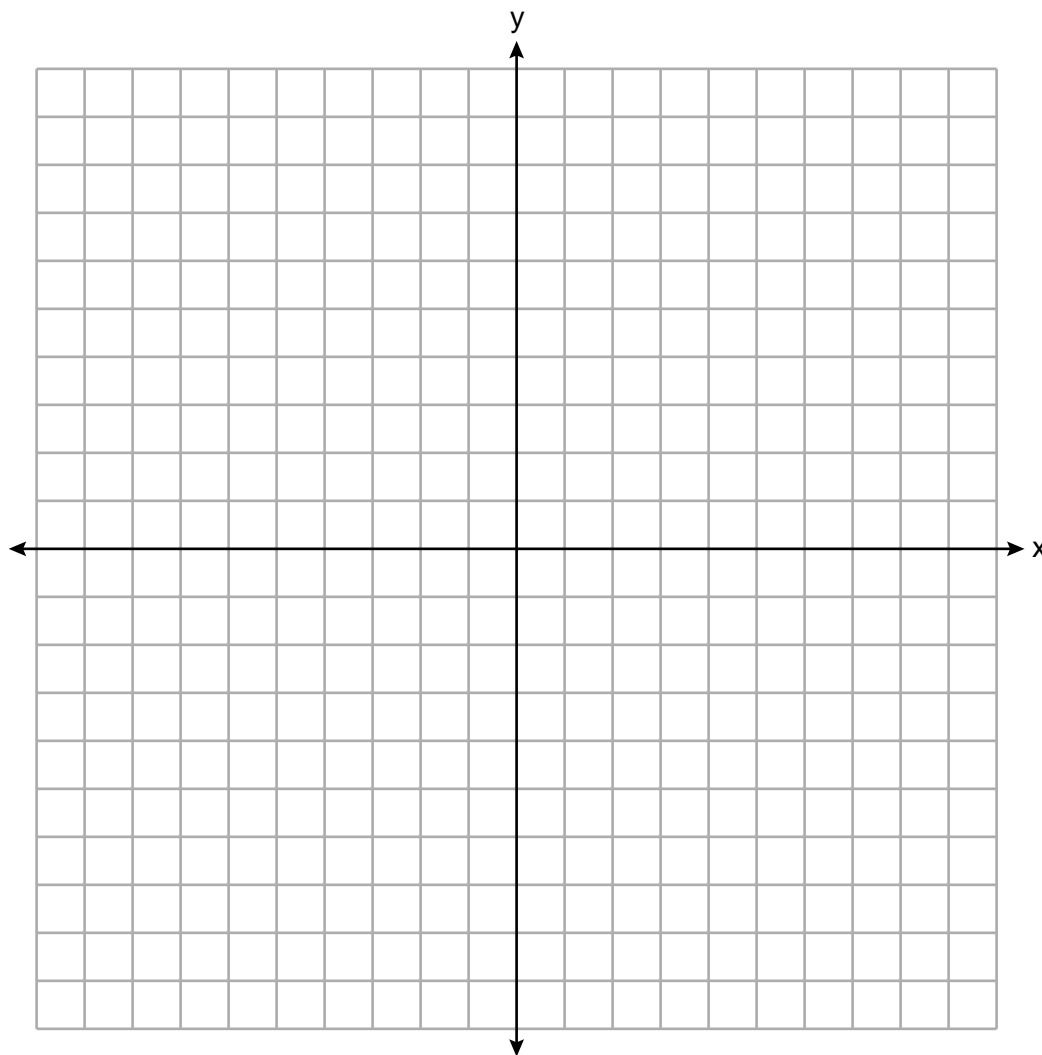
24 If $a_n = n(a_{n-1})$ and $a_1 = 1$, what is the value of a_5 ?

- (1) 5 (3) 120
(2) 20 (4) 720
-

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 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.



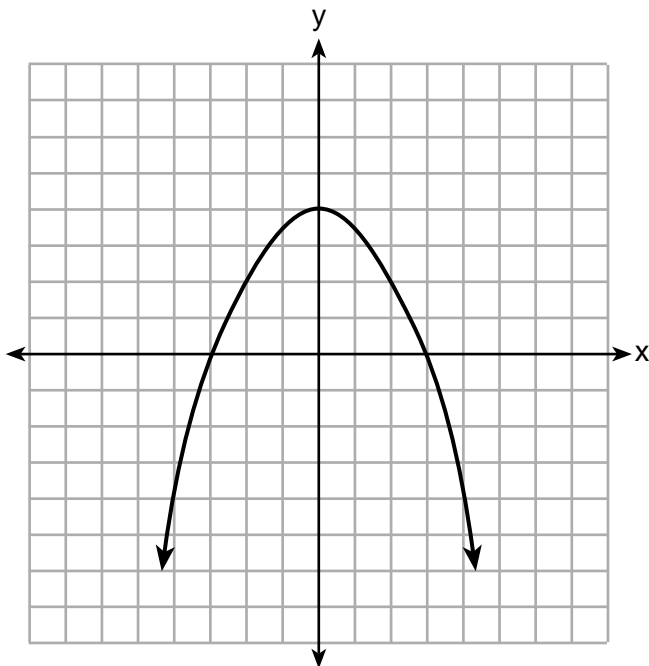
26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.

28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.



29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

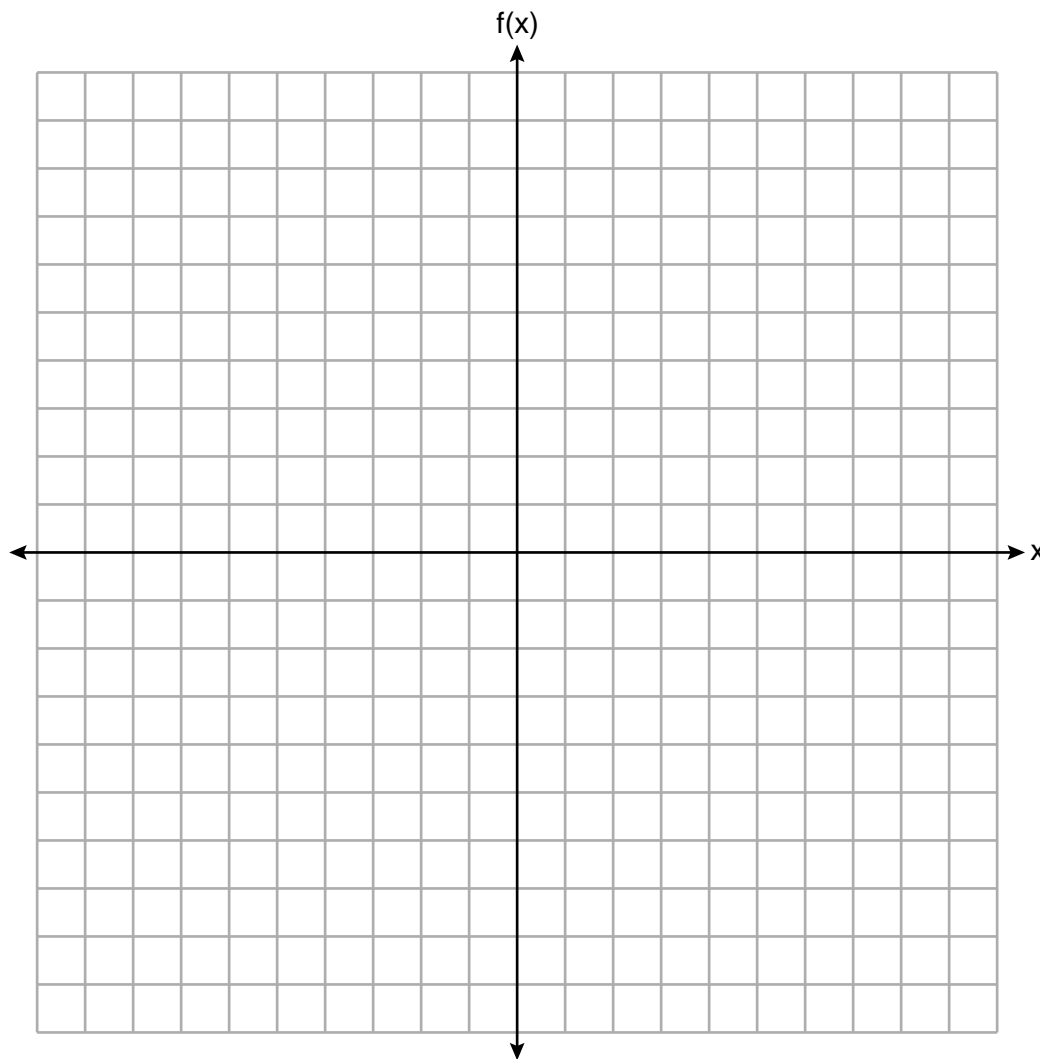
30 Solve the equation below algebraically for the exact value of x .

$$6 - \frac{2}{3}(x + 5) = 4x$$

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$



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 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

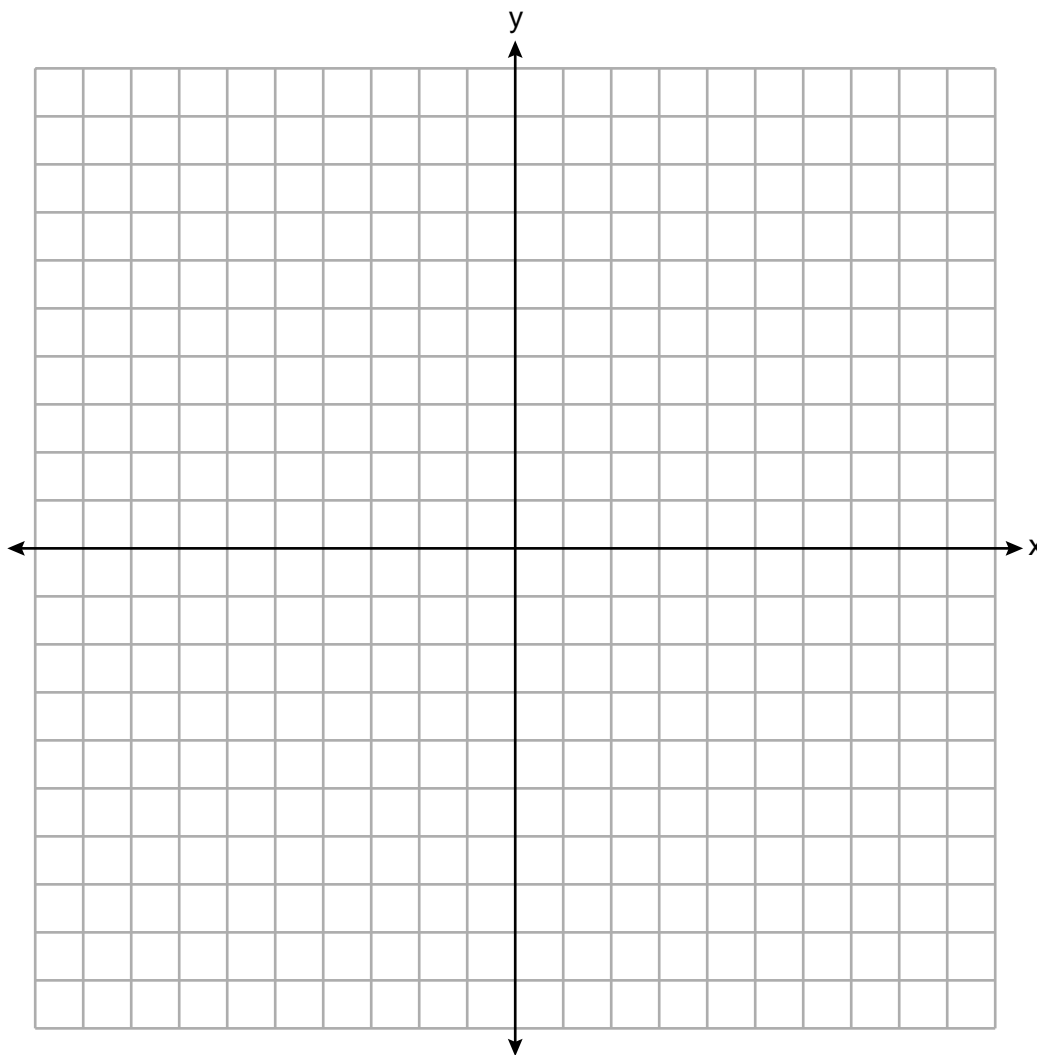
34 There are two parking garages in Beacon Falls. Garage *A* charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage *B* charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage *A* and Garage *B*.

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

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

$$\begin{aligned} 2y + 3x &\leq 14 \\ 4x - y &< 2 \end{aligned}$$



Determine if the point (1,2) is in the solution set. Explain your answer.

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

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 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

Question 37 is continued on the next page.

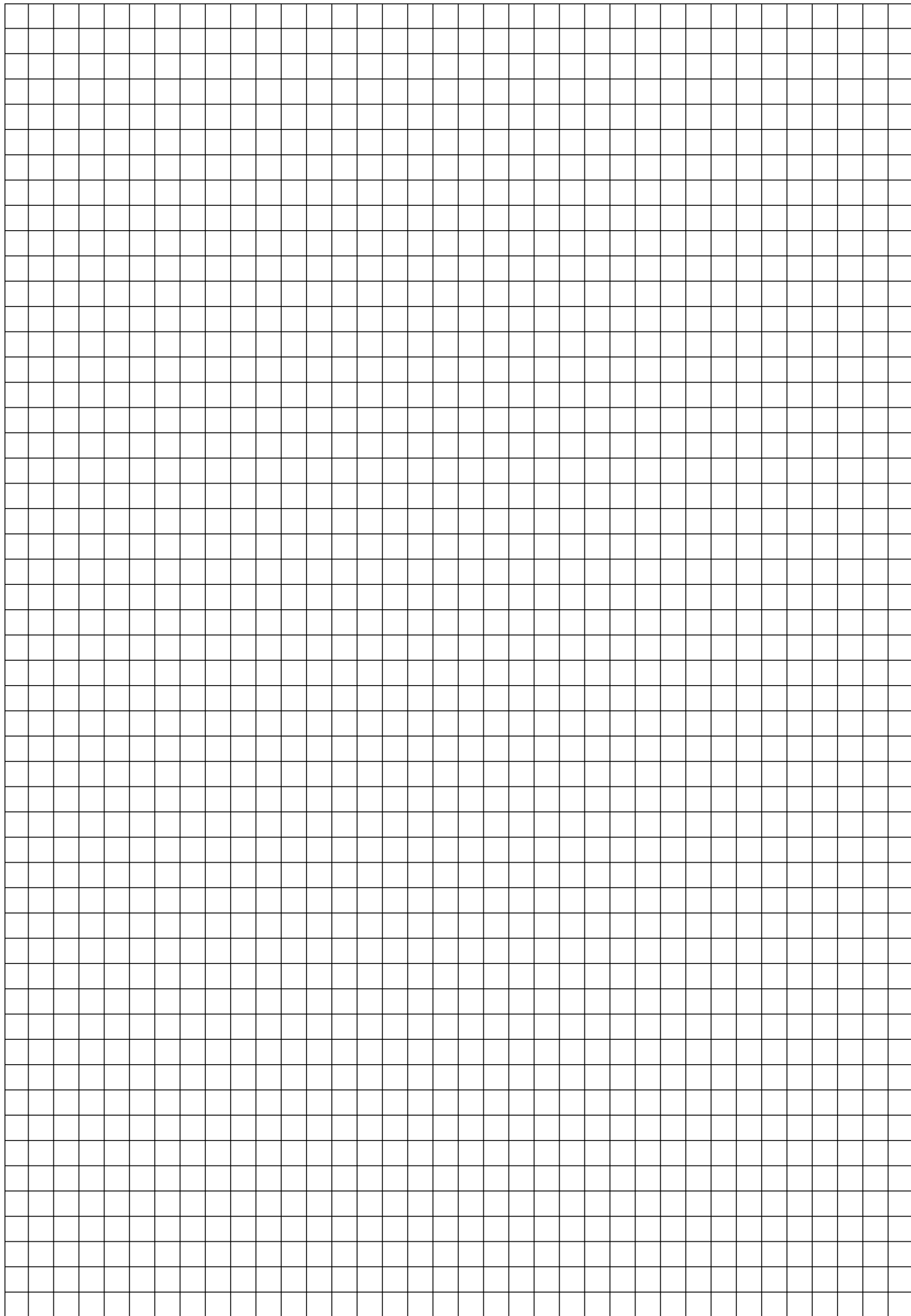
Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

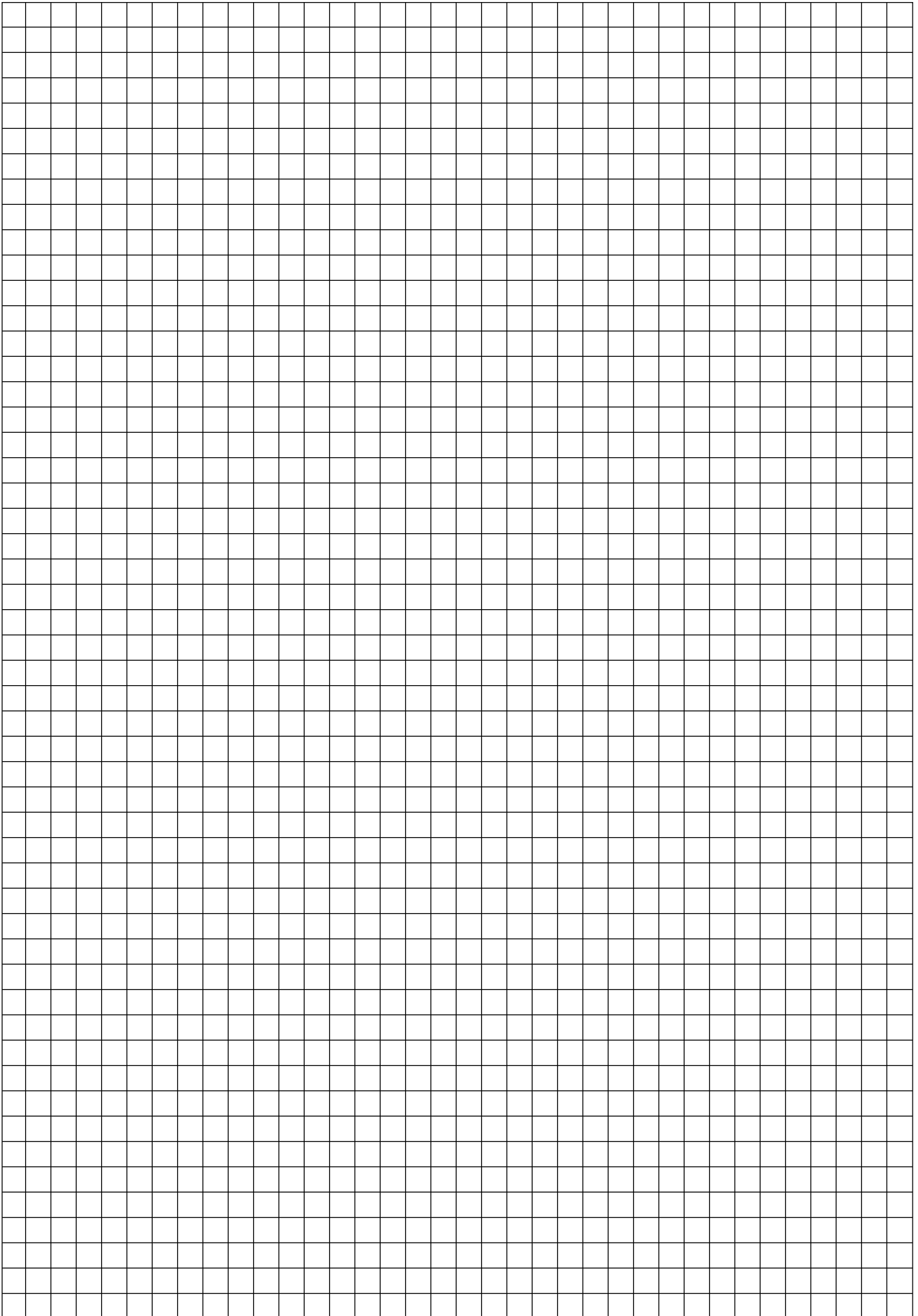
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Scrap Graph Paper — this sheet will *not* be scored.



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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

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

ALGEBRA I

Tuesday, June 12, 2018 — 1:15 to 4:15 p.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. 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 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.

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 Tuesday, June 12, 2018. 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) 4	(9) 1	(17) 3
(2) 4	(10) 1	(18) 2
(3) 2	(11) 4	(19) 3
(4) 3	(12) 3	(20) 3
(5) 2	(13) 2	(21) 2
(6) 1	(14) 4	(22) 3
(7) 1	(15) 1	(23) 4
(8) 4	(16) 3	(24) 3

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 recommended 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/>.

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] A correct graph is drawn over the given domain.

[1] Appropriate work is shown, but one graphing error is made, such as extending beyond the domain.

or

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

[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] A correct explanation indicating a positive response 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] Yes, but the explanation is incomplete.

[0] Yes, but no explanation or an incorrect explanation is written.

or

[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] 1.8 and -2.8 , and correct work is shown.

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

or

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

or

[1] 1.8 and -2.8 , 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.

(28) [2] A correct graph is drawn.

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

or

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

[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] 4, and correct algebraic work is shown.

[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] 4, but a method other than algebraic is used.

or

[1] 4, 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] $\frac{8}{14}$ or $\overline{0.571428}$, or an equivalent fraction, 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] $\frac{8}{14}$, 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]** Rational is stated, 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] $2\frac{2}{7}$ or equivalent and rational are written, but no explanation or an incorrect explanation is written.

[0] Rational, but no explanation or an incorrect explanation is written.

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]** A correct graph is drawn.

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

or

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

[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] Correct explanations are written, 0.8, 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 one explanation is missing or incorrect.
- [2] Correct explanations are written, but no further correct work is shown.
- or*
- [2] Appropriate work is shown to find 0.8, but no further correct work is shown.
- [1] One correct explanation is written, but no further correct work is shown.
- or*
- [1] 0.8 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.
- (34) [4] Correct equations are written, and 4, and correct algebraic work is shown.
- [3] Appropriate work is shown, but one computational error is made.
- or*
- [3] Appropriate work is shown, but a method other than algebraic is used to determine 4.
- or*
- [3] Correct equations are written and 4 is stated, but no work is shown.
- [2] Appropriate work is shown, but two or more computational errors are made.
- or*
- [2] Correct equations are written, but no further correct work is shown.
- [1] One correct equation is written, but no further correct work is shown.
- or*
- [1] 4, 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] 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] The system of inequalities is graphed correctly and at least one is labeled, and “no” is stated, but the explanation is missing or incorrect.

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] $2y + 3x = 14$ and $4x - y = 2$ 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.

(36) [4] $y = 0.96x + 23.95$, 0.92, and a correct explanation in context is written.

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

or

[3] Appropriate work is shown, but the expression $0.96x + 23.95$ is written.

or

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

or

[3] An incorrect linear regression equation is written, but a correlation coefficient is stated and explained appropriately.

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

or

[2] $y = 0.96x + 23.95$ is written, but no further correct work is shown.

[1] The expression $0.96x + 23.95$ 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.

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] $d + q = 90$, $.10d + .25q = 17.55$ or an equivalent system, or an equation in one variable, 57, and correct algebraic work is shown, and a correct justification indicating that Dylan won't have enough money is written.

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

or

[5] Appropriate work is shown, but the justification is incomplete or incorrect.

or

[5] Appropriate work is shown, but a method other than algebraic is used to determine 57.

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

or

[4] Appropriate work is shown to find 57, but no further correct work is shown.

[3] A correct system of equations and 57 are written, but no work is shown.

[2] A correct justification indicating that Dylan won't have enough money is written, but no further correct work is shown.

or

[2] A correct system of equations or an equation in one variable is written, but no further correct work is shown.

[1] One correct equation in two variables is written, but no further correct work is shown.

or

[1] 57, 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 Core Learning Standards
Algebra I
June 2018

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

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

Regents Examination in Algebra I

June 2018

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

The Chart for Determining the Final Examination Score for the June 2018 Regents Examination in Algebra I will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> by Tuesday, June 12, 2018. 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, June 12, 2018 — 1:15 to 4:15 p.m.

MODEL RESPONSE SET

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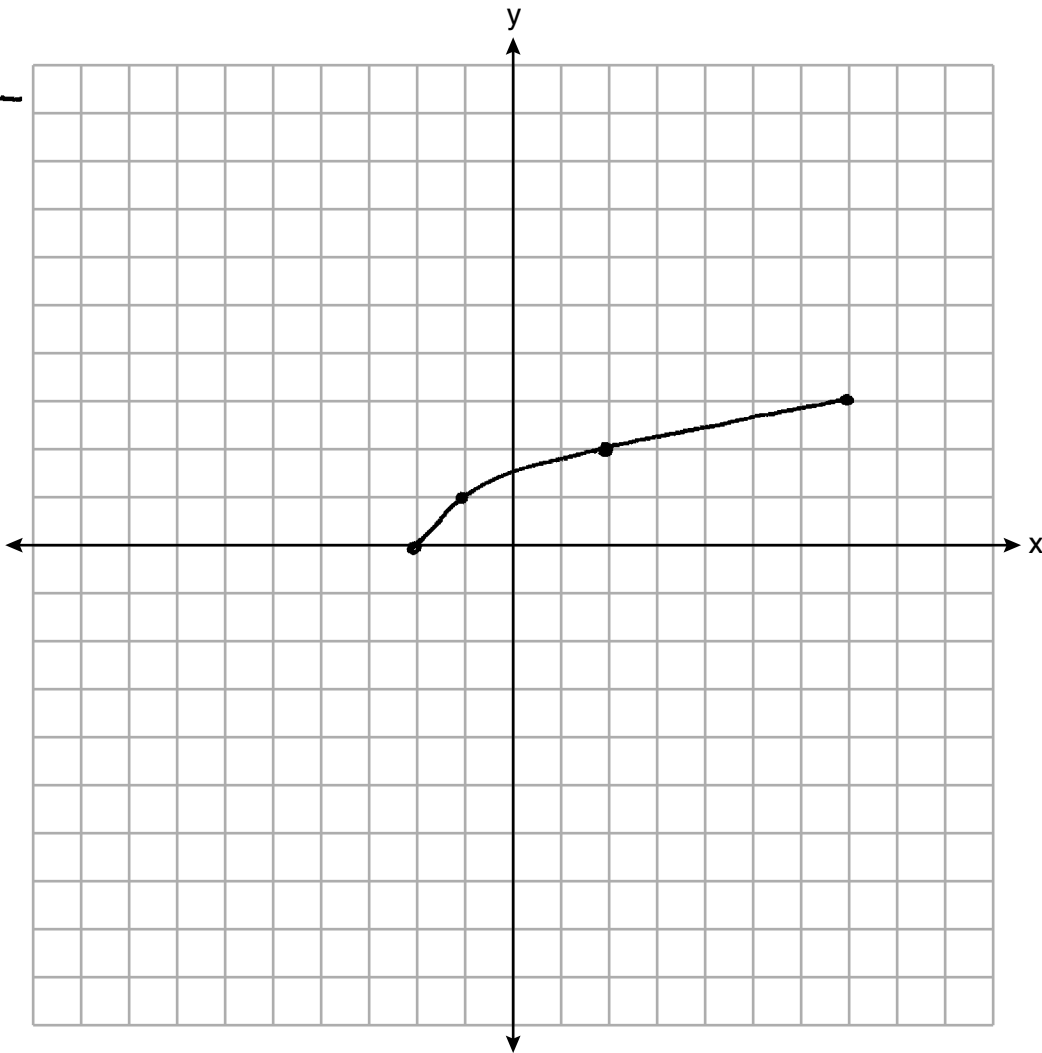
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Question 25

25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.

$$\sqrt{x+2}$$

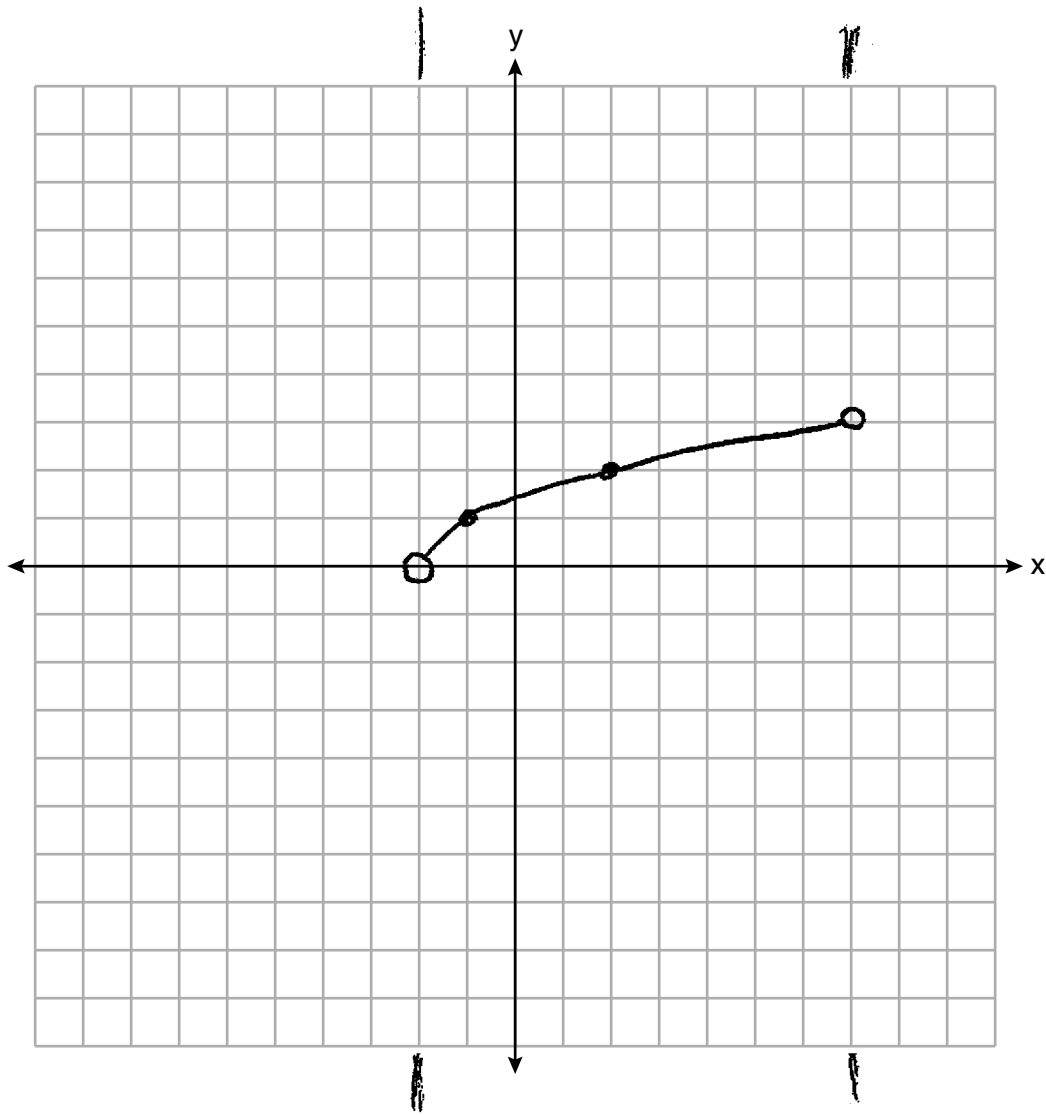
x	y
-2	0
-1	1
0	2
1	3
2	4
3	5
4	6
5	7
6	8
7	9



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

Question 25

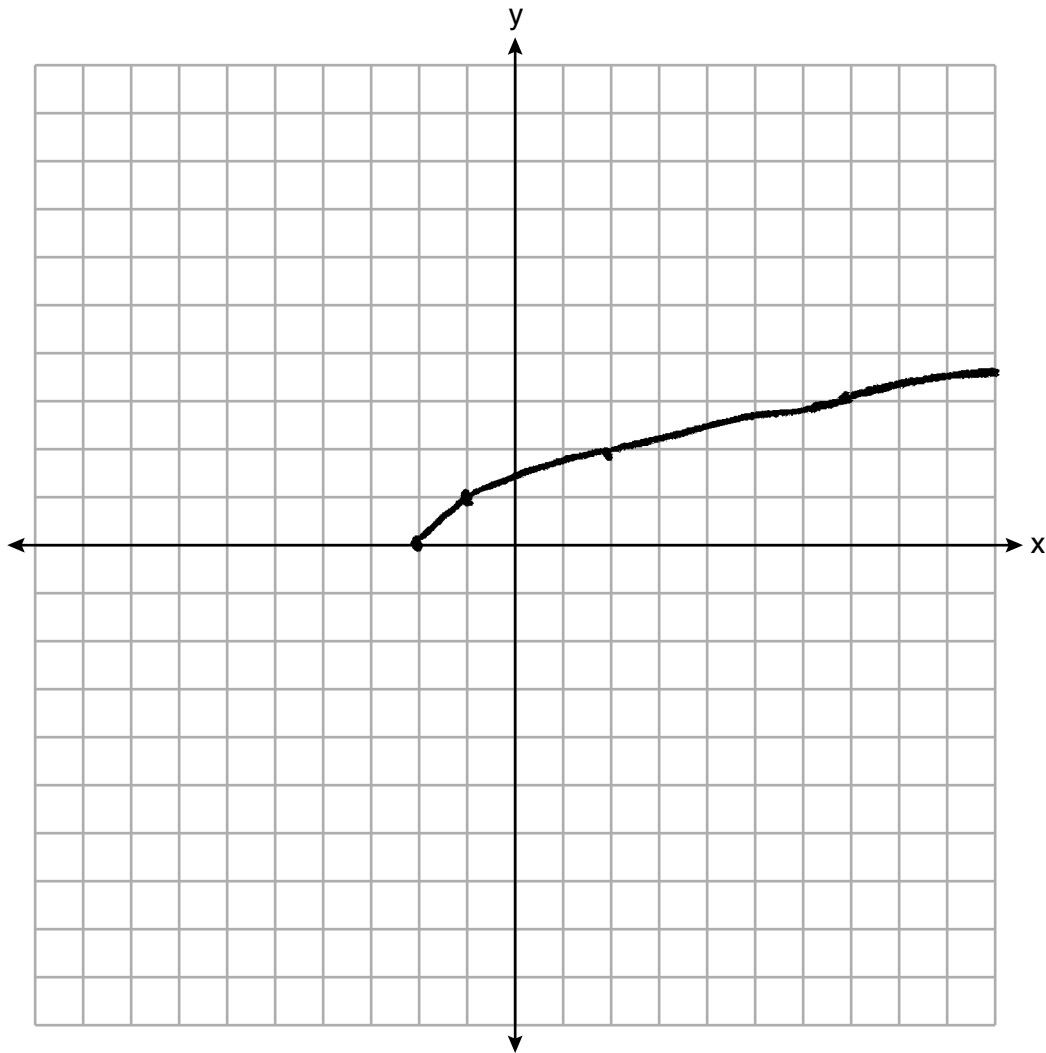
25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.



Score 1: The student graphed $-2 < x < 7$.

Question 25

25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.

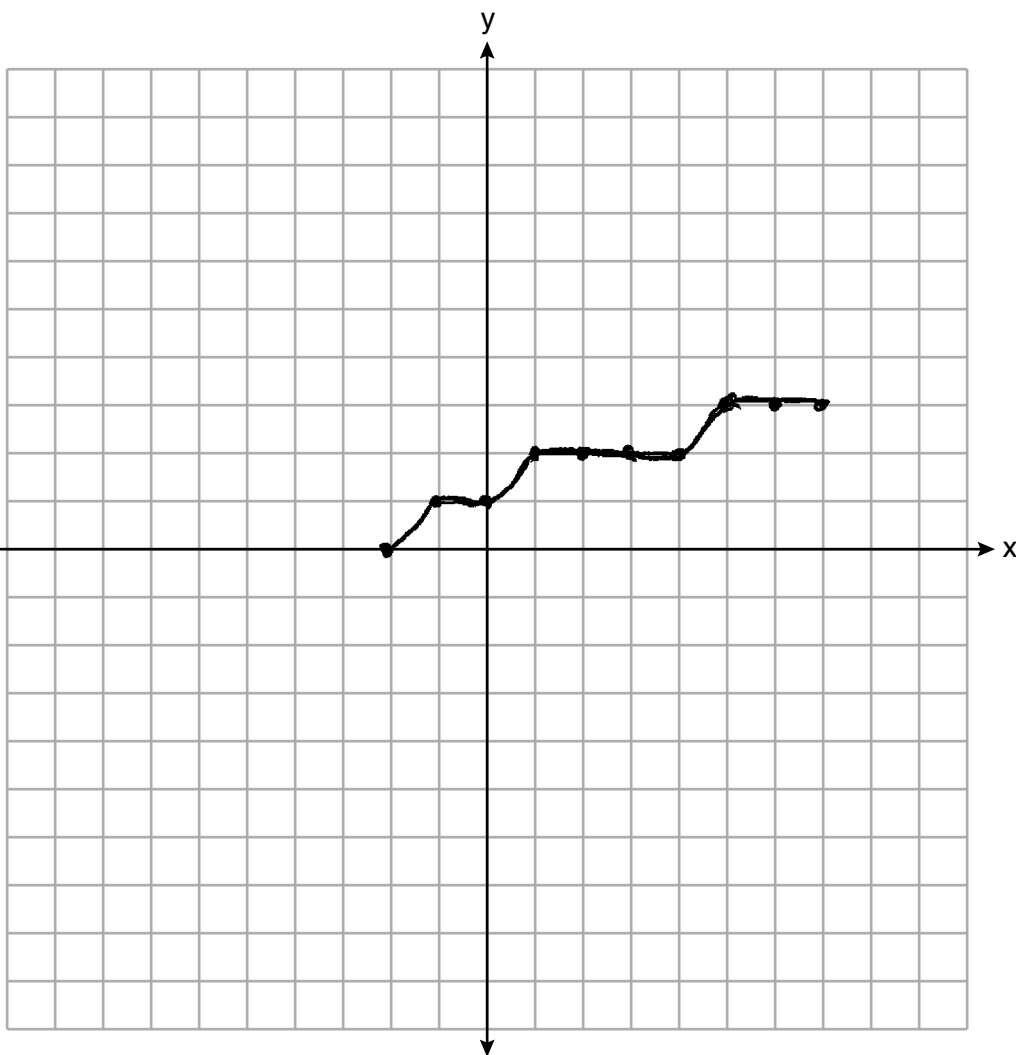


Score 1: The student graphed beyond $x = 7$.

Question 25

25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.

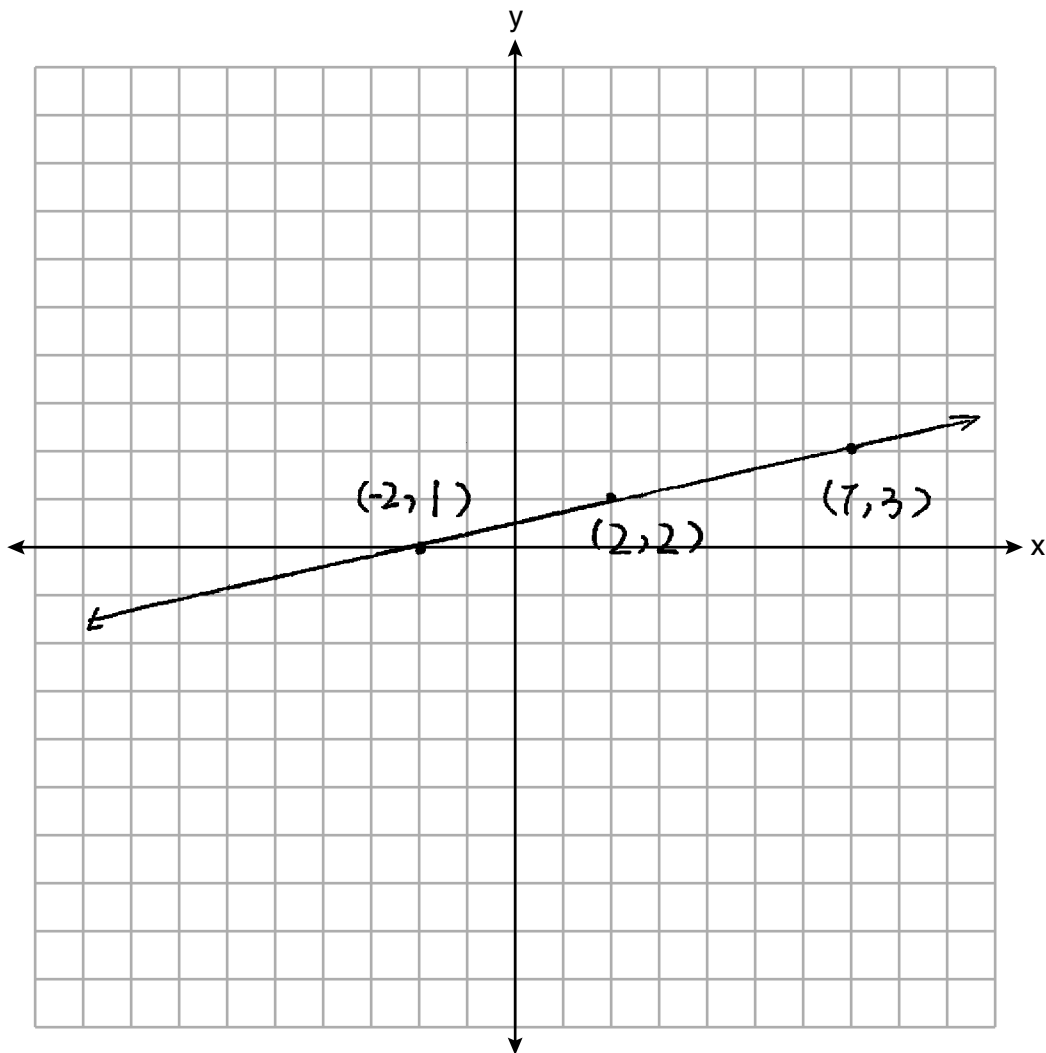
X	Y
-2	0
-1	1
0	1
1	2
2	2
3	2
4	2
5	3
6	3
7	3



Score 1: The student rounded values when completing their chart, but drew an appropriate graph.

Question 25

25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.



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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

↓ +2
↓ +6
↓ +8

State if Caleb is correct. Explain your reasoning.

Caleb is correct. According to the data table, $f(x)$ was increasing by multiplying by two.

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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

Handwritten annotations to the right of the table:
A bracket between the first and second rows is labeled "+2".
A bracket between the second and third rows is labeled "+4".
A bracket between the third and fourth rows is labeled "+8".

State if Caleb is correct. Explain your reasoning.

Caleb is correct because there is not a constant rate of change.

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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.

Caleb is correct because the equation for this table is $f(x) = 2^{x+1}$, which is not a line

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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.

$y = 2(2)^x$ Yes Caleb
is correct

Score 1: The student gave a correct justification, but did not write an explanation.

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.

x	f(x)
0	2
1	4
2	8
3	16
4	32
5	64
6	128

as x goes up
by 1 f(x) is
doubled.

Score 1: The student did not indicate a positive response.

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

Determination.

	x	f(x)	
+1	0	2	+ 2
+ 1	1	4	+ 4
+ 1	2	8	+ 8
+ 1	3	16	

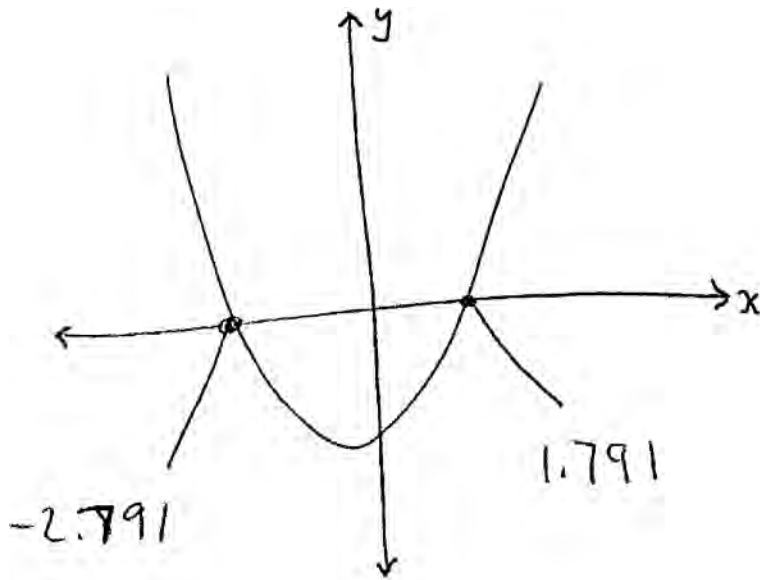
State if Caleb is correct. Explain your reasoning.

Caleb is not correct because there is no constant slope nor is there a relationship between x and $f(x)$

Score 0: The student contradicted their negative response in the first part of their explanation. The remainder of the explanation is incorrect.

Question 27

27 Solve for x to the nearest tenth: $x^2 + x - 5 = 0$.



$$x = -2.8 \quad x = 1.8$$

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

Question 27

27 Solve for x to the nearest tenth: $x^2 + x - 5 = 0$.

$$a=1$$

$$b=1$$

$$c=-5$$

$$X = \frac{-1 \pm \sqrt{(1)^2 - 4(1)(-5)}}{2}$$

$$X = \frac{-1 \pm \sqrt{1+20}}{2}$$

$$X = \frac{-1 \pm \sqrt{21}}{2}$$

$$X = 1.8$$

$$X = -2.8$$

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

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.

$$\begin{aligned} a &= 1 & x^2 + x &= 5 \\ b &= 1 \\ c &= -5 \end{aligned}$$

$$\frac{-1 \pm \sqrt{1^2 - 4(1)(-5)}}{2(1)}$$

$$\frac{-1 \pm \sqrt{21}}{2}$$

Score 1: The student did not give their answer as a decimal rounded to the nearest tenth.

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.

$$x = \frac{-1 \pm \sqrt{1+20}}{2}$$

$$x = \frac{-1 \pm \sqrt{21}}{2}$$

$$x = \cancel{-2.8} \quad x = 1.8$$

Score 1: The student gave one correct response.

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.

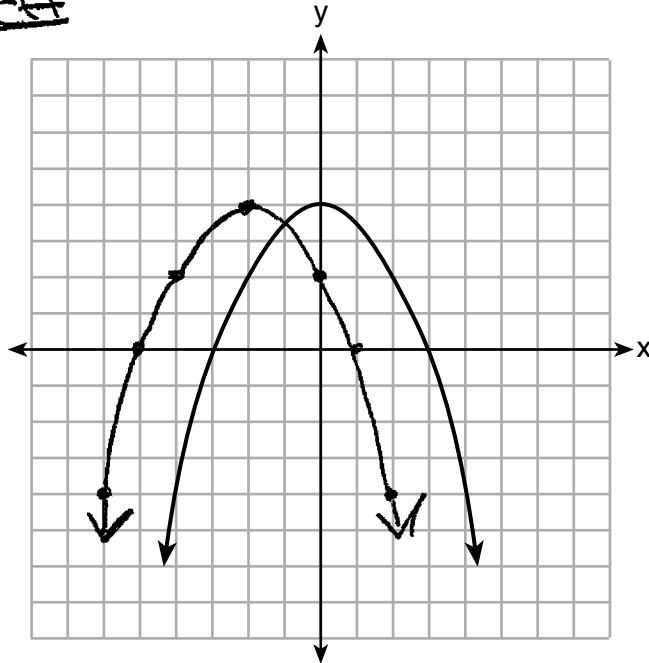
$$\begin{array}{l} x^2 + x - 5 = 0 \\ (x + 5)(x - 1) = 0 \\ \hline \begin{array}{l|l} x + 5 = 0 & x - 1 = 0 \\ -5 \quad -5 & +1 \quad +1 \\ \hline x = -5 & x = 1 \end{array} \\ (-5, 1) \end{array}$$

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

Question 28

28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.

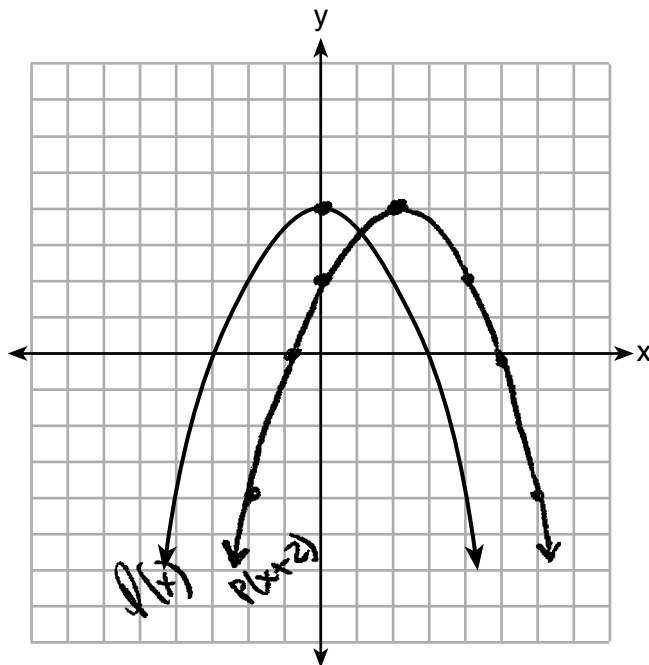
2 to the left



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

Question 28

28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.



~~$P(x) = (x+3)$~~

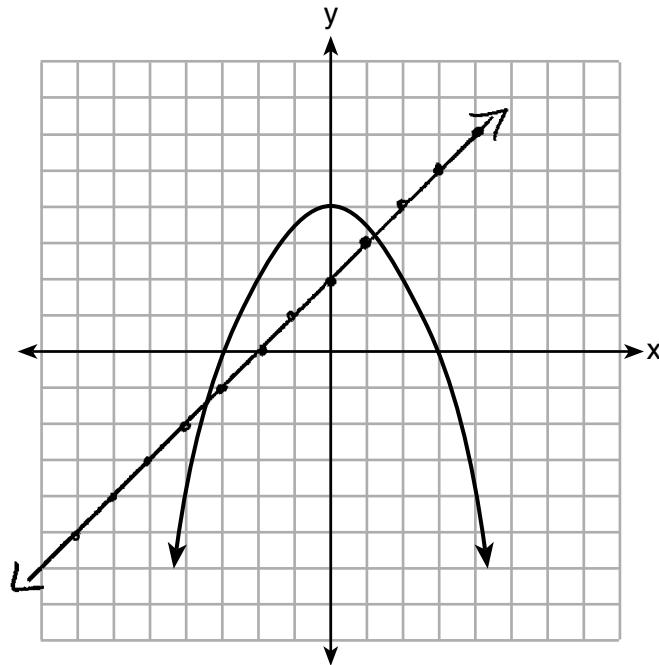
(x)
 $(x+2)$

$\rightarrow 2$

Score 1: The student made a shift to the right.

Question 28

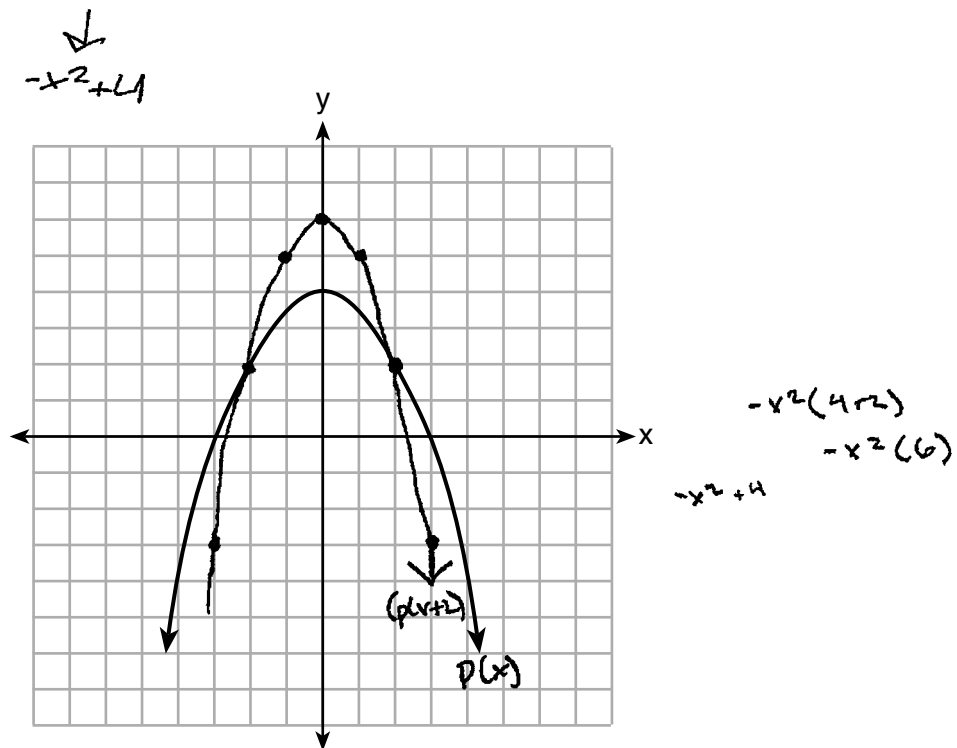
28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.



Score 0: The student graphed $y = x + 2$ instead of $p(x + 2)$.

Question 28

28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.



Score 0: The student shifted the vertex up 2, but did not shift all the points the same way.

Question 29

- 29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

$$h(t) = \frac{-16t^2}{16} + \frac{256}{16}$$
$$h(t) = 16(-t + 16)$$

$$h(4) = -16(4)^2 + 256$$
$$0 = -256 + 256$$

$$\frac{-256}{-16} = \frac{-16t^2}{-16}$$

$$\sqrt{16} = \sqrt{t^2}$$

$$\boxed{4 = t}$$

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

Question 29

- 29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

$$\begin{aligned}h(t) &= -16t^2 + 256 \\0 &= -16t^2 + 256 \\0 &= (4t + 16)(-4t + 16) \\0 &= 4t + 16 \quad | \quad 0 = -4t + 16 \\-16 &= 4t \quad | \quad -16 = -4t \\~~-4 &= t~~ \quad | \quad 4 = t\end{aligned}$$

4 seconds

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

Question 29

29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

$$y = \text{intercept} = 256$$
$$x = \text{intercept} = 1$$

1 second

make
high
0

$$0 = -16t^2 + 256$$
$$\sqrt{16t^2} = \sqrt{256}$$
$$\frac{16t}{16} = \frac{16}{16}$$
$$t = 1$$

Score 1: The student made an error in computing $\sqrt{16t^2}$.

Question 29

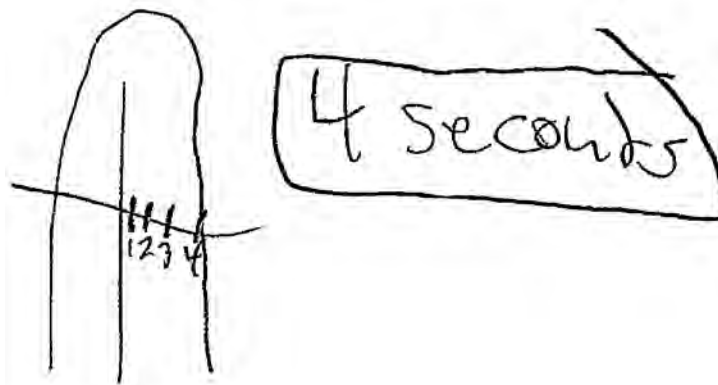
29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

$$\begin{aligned}h(t) &= -16t^2 + 256 \\0 &= -16(t^2 - 16) \\0 &= t^2 - 16 \\16 &= t^2 \\t &= \pm 4\end{aligned}$$

Score 1: The student included -4 in their solution.

Question 29

29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.



Score 1: The student did not determine the answer algebraically.

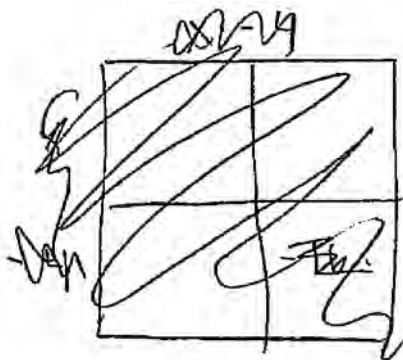
Question 29

29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

$$h(t) = \frac{-16t^2 + 256}{-16}$$

$$h(t) = t^2 - 16$$

$$t^2 - 16 = 0$$



It takes 16 seconds.

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

Question 30

30 Solve the equation below algebraically for the exact value of x .

$$6 - \frac{2}{3}(x + 5) = 4x$$

$$6 - \frac{2}{3}(x + 5) = 4x$$

$$6 - \frac{2}{3}x - \frac{10}{3} = 4x$$
$$+ \frac{2}{3}x \qquad + \frac{2}{3}x$$

$$6 - \frac{10}{3} = 4\frac{2}{3}x$$

$$3\left(\frac{8}{3}\right) = \left(\frac{14}{3}x\right)3$$

$$\frac{8}{14} = \frac{14x}{14}$$

$$\frac{8}{14} = x$$

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

Question 30

30 Solve the equation below algebraically for the exact value of x .

$$6 - \frac{2}{3}(x + 5) = 4x$$

$$\begin{array}{r} 6 - \frac{2}{3}x - 3\bar{3} = 4x \\ + \frac{2}{3}x \qquad \qquad + \frac{2}{3}x \\ \hline \frac{2.\bar{6}}{4.\bar{6}} = \frac{4.\bar{6}x}{4.\bar{6}} \\ .5\bar{7} = x \end{array}$$

Score 1: The student gave a rounded answer for x .

Question 30

30 Solve the equation below algebraically for the exact value of x .

$$6 - \frac{2}{3}(x + 5) = 4x$$

$$6 - \frac{2}{3}(x + 5) = 4x$$

$$6 - \frac{2}{3}x + \frac{10}{3} = 4x$$

$$\frac{28}{3} = 4\frac{2}{3}x$$

$$\frac{\frac{28}{3}}{\frac{10}{3}} = x$$

$$\frac{28}{10} = x$$

Score 0: The student made more than one error.

Question 31

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

$$(\sqrt{16}) \frac{4}{7}$$

$$(4) \frac{4}{7} = \frac{16}{7} = 2.285714285714$$

It is rational. This is because the product repeats 285714 forever, and an irrational number cannot repeat.

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

Question 31

31 Is the product of $\sqrt[2]{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

Rational. A rational times a rational
is always rational.

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

Question 31

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

$$\sqrt{16} \times \frac{4}{7} = 2.285714$$

rational because it's a decimal that doesn't
have a pattern

Score 1: The student stated a correct value for the product, but wrote an incorrect explanation.

Question 31

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

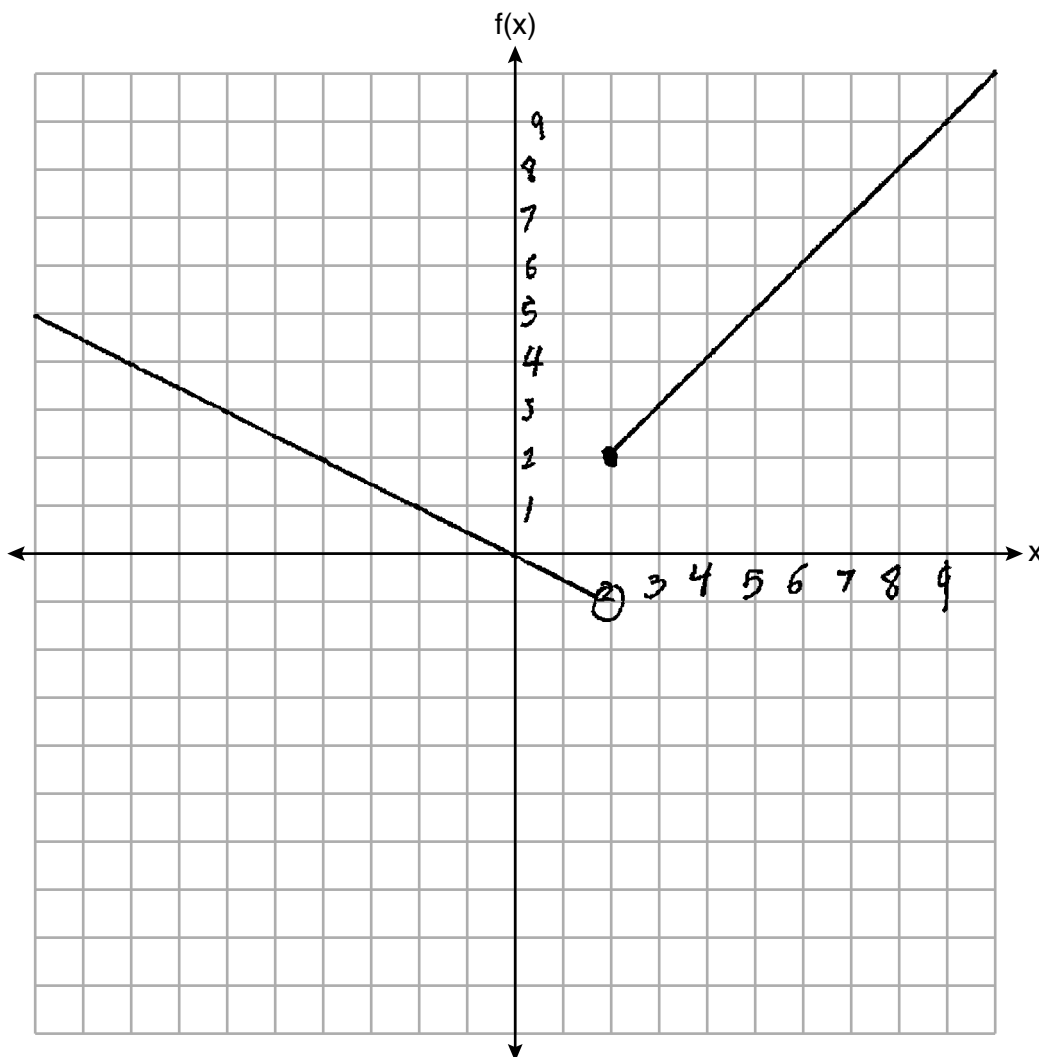
rational | it is a
whole number

Score 0: The student gave a completely incorrect response.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$

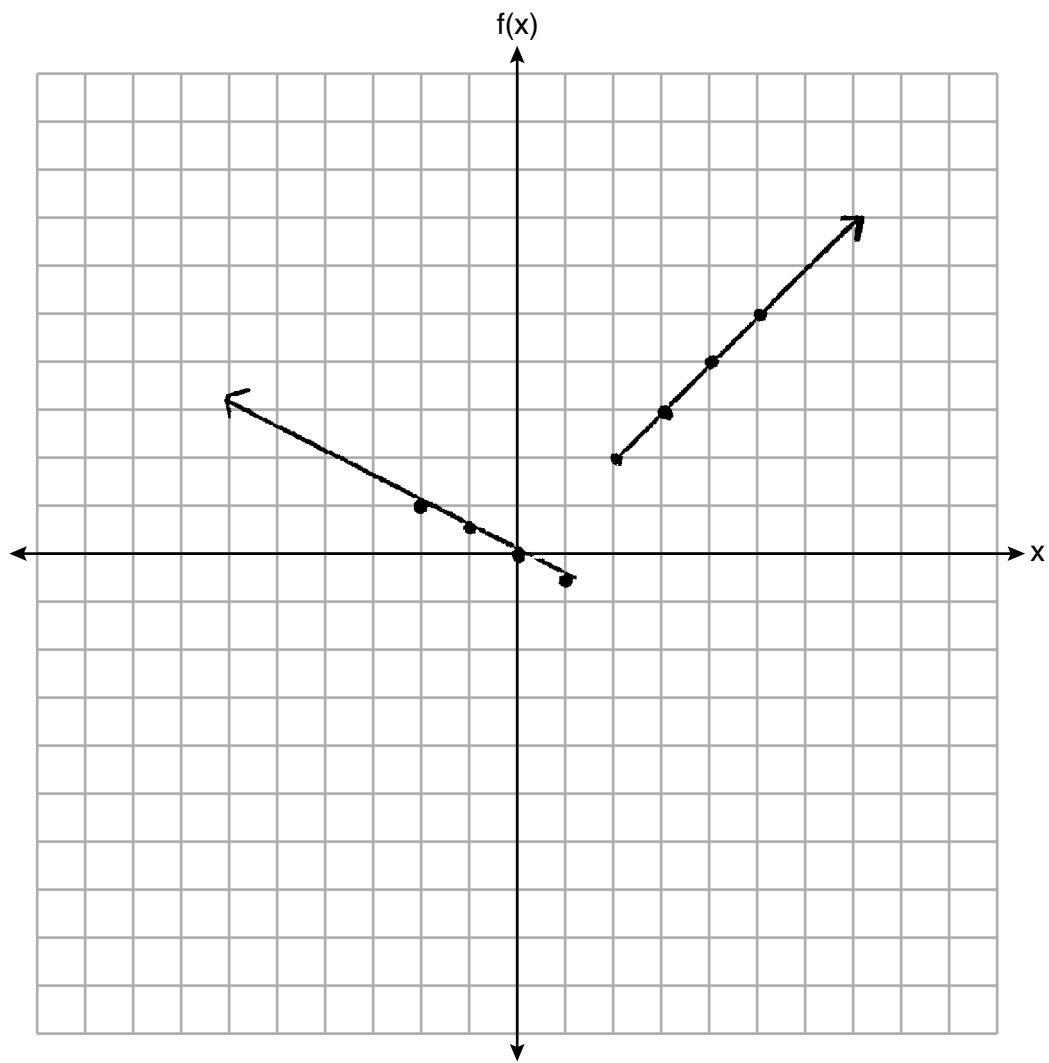


Score 2: The student gave a complete and correct response.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$

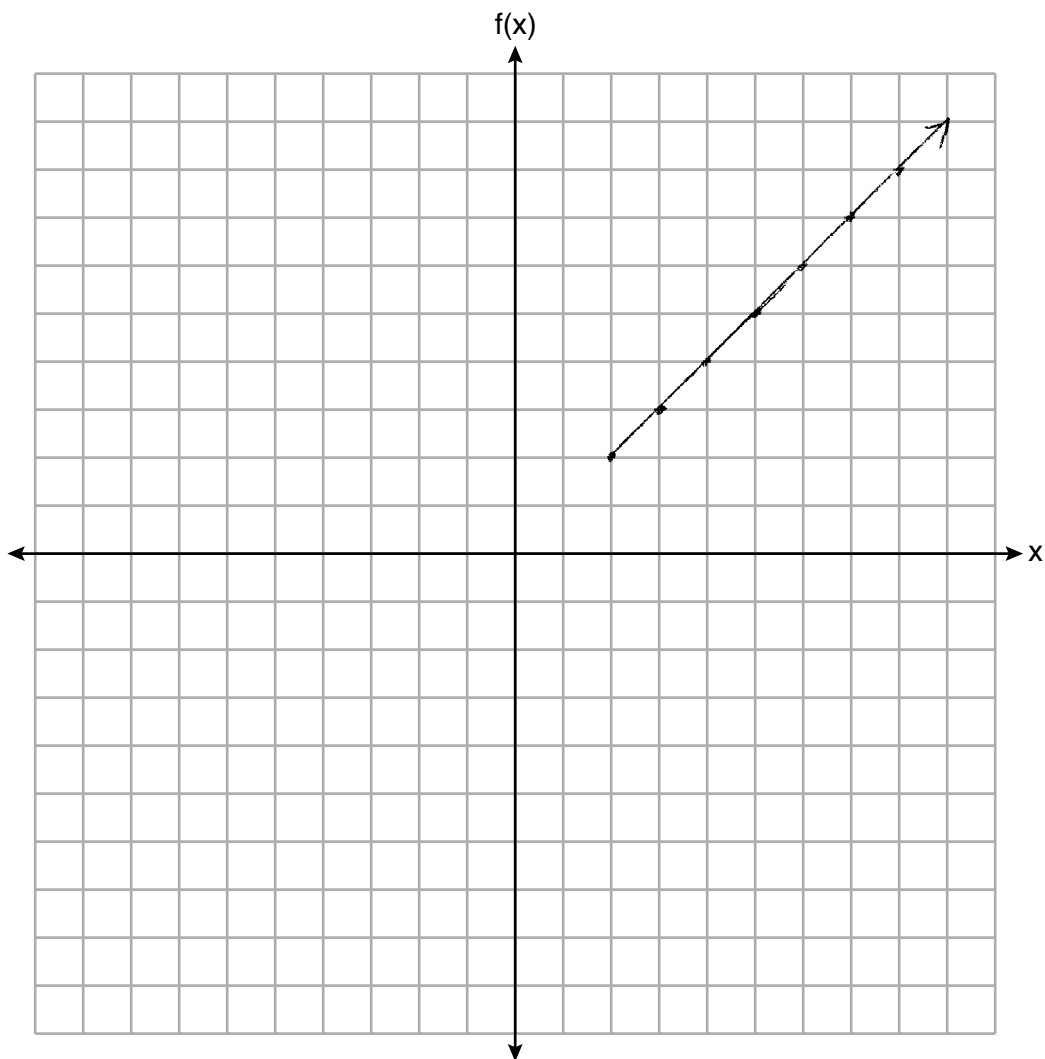


Score 1: The student graphed $f(x) = -\frac{1}{2}x, x \leq 1$.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$

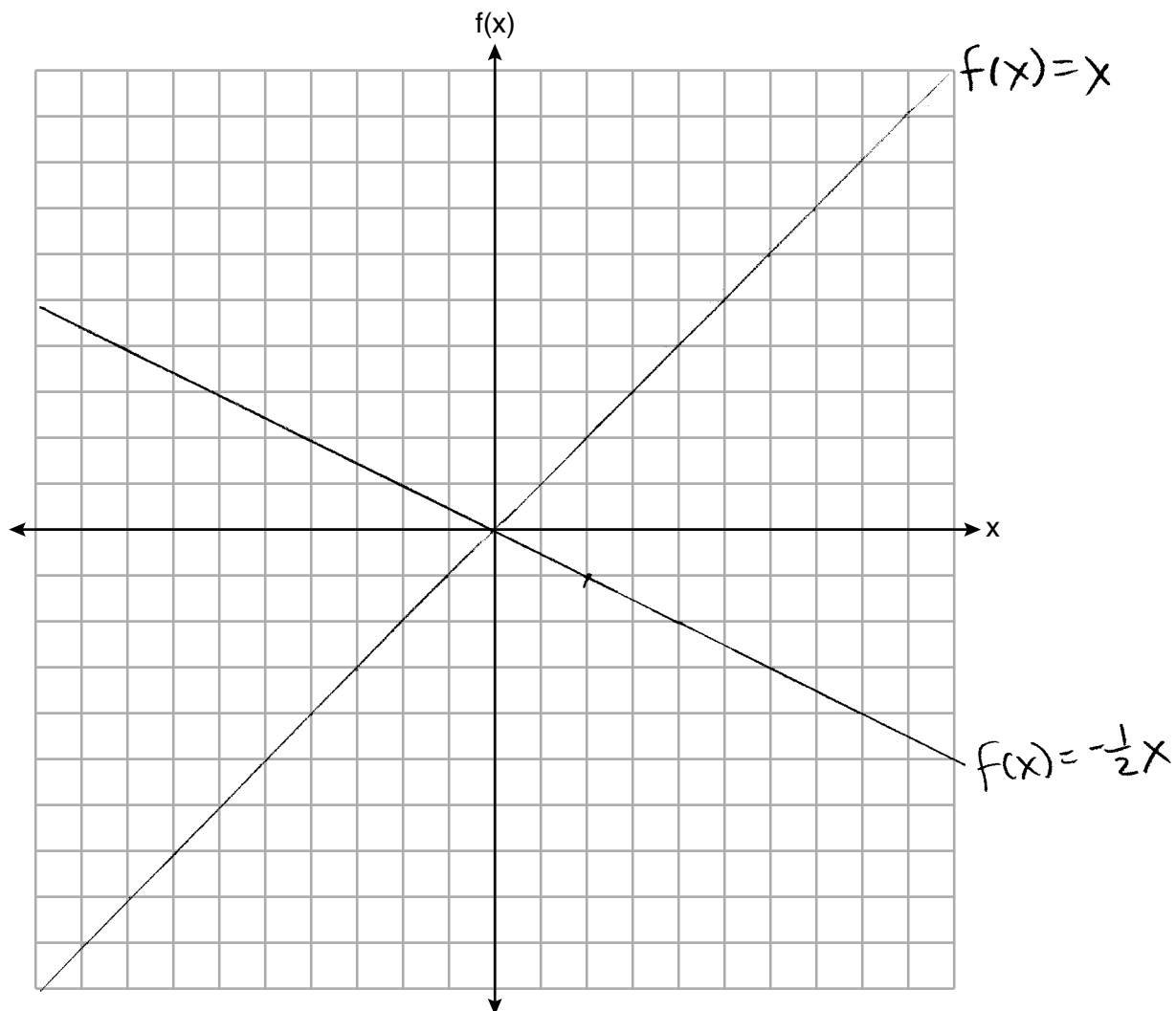


Score 1: The student graphed $f(x) = x, x \geq 2$ correctly.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$



Score 0: The student did not show enough grade-level work to receive any credit.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 represents the starting number of rabbits in the lab.
1.014 represents one plus the percent growth of the rabbit population per day written as a decimal.

Determine, to the nearest tenth, the average rate of change from day 50 to day 100.

$$\begin{aligned} & \underline{50} \\ p(x) &= 20(1.014)^x \\ p(x) &= 20(1.014)^{(50)} \\ p(x) &= 40.08000 \dots \\ & \approx \\ p(x) &= 40.1 \end{aligned}$$

$$\begin{aligned} & \underline{100} \\ p(x) &= 20(1.014)^x \\ p(x) &= 20(1.014)^{(100)} \\ p(x) &= 80.32033 \dots \\ & \approx \\ p(x) &= 80.3 \end{aligned}$$

$$ROC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{80.3 - 40.1}{100 - 50} = 0.804 \approx$$

Rate of change is 0.8

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

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 is the initial number of rabbits and 1.014 is the changing factor which represents an increase of 1.4% in rabbit population

Determine, to the nearest tenth, the average rate of change from day 50 to day 100.

$$p(50) = 20(1.014)^{50} = 40.1$$

$$p(100) = 20(1.014)^{100} = 80.3$$

$$(50, 40.1) \quad (100, 80.3)$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{80.3 - 40.1}{100 - 50} = \frac{40.2}{50} \rightarrow \boxed{0.8}$$

Score 3: The student made an error in their explanation of 1.014 by not stating an increase of 1.4% per day.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 means that they started with 20 rabbits.
 The "1.014" is the rate of bunny reproduction
 per day

Determine, to the nearest tenth, the average rate of change from day 50 to day 100.

$$\begin{array}{l}
 p(50) = 20(1.014)^{50} \\
 p(100) = 20(1.014)^{100} \\
 p(50) = 40.04000302 \\
 p(100) = 80.32033208 \\
 \hline
 \frac{80.32033208 - 40.04000302}{100 - 50} = \frac{40.24032906}{50} \\
 = 0.8048065813 \\
 \text{.8 bunnies per day}
 \end{array}$$

Score 3: The student wrote an incorrect explanation for 1.014.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

The 1.014 is really 1.4% if you move the decimal point and it represents the percentage. The 20 represents the starting number of rabbits.

Determine, to the nearest tenth, the average rate of change from day 50 to day 100.

$$p(50) = 20(1.014)^{50}$$

$$p(50) = 40.1$$

$$p(100) = 20(1.014)^{100}$$

$$p(100) = 80.3$$

$$\begin{array}{r} 180.3 \\ - 40.1 \\ \hline 40.2 \end{array}$$

40.2 is the average rate of change

Score 2: The student wrote an incomplete explanation for 1.014 and found the amount of change from day 50 to day 100, not the rate of change.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 represents how many rabbits the lab starts with

1.014 represents the rate of them

Determine to the nearest tenth, the average rate of change from day 50 to day 100.

ROC = .2

$$\frac{50}{100} = \frac{2}{2}$$

$$20(1.014)^{50} = 40.08000302$$

$$20(1.014)^{100} = 80.32033208$$

$$\frac{2.0040015}{2}$$

$$80.32033208$$

$$\frac{2.0}{2}$$

ROC = $\frac{\text{time}}{\text{distance}}$

$$\frac{50}{40.}$$

$$= \frac{100}{80.32...} = \frac{2}{2}$$

Score 1: The student wrote one correct explanation.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 = initial
1.014 = Percent

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

$20(1.014)^{50}$
40.08
 $20(1.014)^{100}$
80.32

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

Question 34

34 There are two parking garages in Beacon Falls. Garage A charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage B charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage A and Garage B.

Garage A

$$y = 3.00(x - 2) + 7.00$$

Garage B

$$y = 3.25x$$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

$$y = 3.00(x - 2) + 7.00$$

$$y = 3.25x$$

$$3.25x = 3.00(x - 2) + 7.00$$

$$3.25x = 3x - 6 + 7.00$$

$$3.25x = 3x + 1$$

$$\begin{array}{r} 3.25x \\ - 3.00x \\ \hline \end{array} = \begin{array}{r} 3x + 1 \\ - 3x \\ \hline \end{array}$$

$$.25x = 1$$

$$\begin{array}{r} .25x \\ \cdot .25 \\ \hline \end{array} = \begin{array}{r} 1 \\ \cdot .25 \\ \hline \end{array}$$

$$1x = 4$$

4 hours

check

$$y = 3.00(4 - 2) + 7.00$$

$$y = 12 - 6 + 7.00$$

$$y = 6 + 7$$

$$y = 13 \checkmark$$

$$y = 3.25(4)$$

$$y = 13 \checkmark$$

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

Question 34

34 There are two parking garages in Beacon Falls. Garage A charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage B charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage A and Garage B.

$$B = 3.25X$$
$$A = 7 + 3(x - 2)$$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

$$X = 4$$

$$3.25(4) = \$13$$

$$7 + 3(4 - 2) = \$13$$

Score 3: The student did not determine the number of hours algebraically.

Question 34

34 There are two parking garages in Beacon Falls. Garage A charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage B charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage A and Garage B.

$$\begin{array}{l} \text{Garage A} \\ \hline 7 + 3(x - 2) \end{array}$$

$$\begin{array}{l} \text{Garage B} \\ \hline 3.25x \end{array}$$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

4 hrs

Score 2: The student wrote two expressions and did not determine the number of hours algebraically.

Question 34

34 There are two parking garages in Beacon Falls. Garage A charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage B charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage A and Garage B.

$$\text{Garage A} \quad C(x) = 3x + 7$$

$$\text{Garage B} \quad C(x) = 3.25x$$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

$$C(x) = 3(28) + 7 = 91$$

$$C(x) = 3.25(28) = 91$$

Score 1: The student wrote one correct equation.

Question 34

34 There are two parking garages in Beacon Falls. Garage A charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage B charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage A and Garage B.

$$3.25(7.00x) = c$$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

Garage A →

X	1	2	3	4	5	6	7	8	9
Y	7.00	14.00	17	20	23	26	29	32	35

Garage B

X	1	2	3	4	5	6	7	8	9
Y	3.25	6.50	9.75	13.00	16.25	19.50	22.75	26	29.25

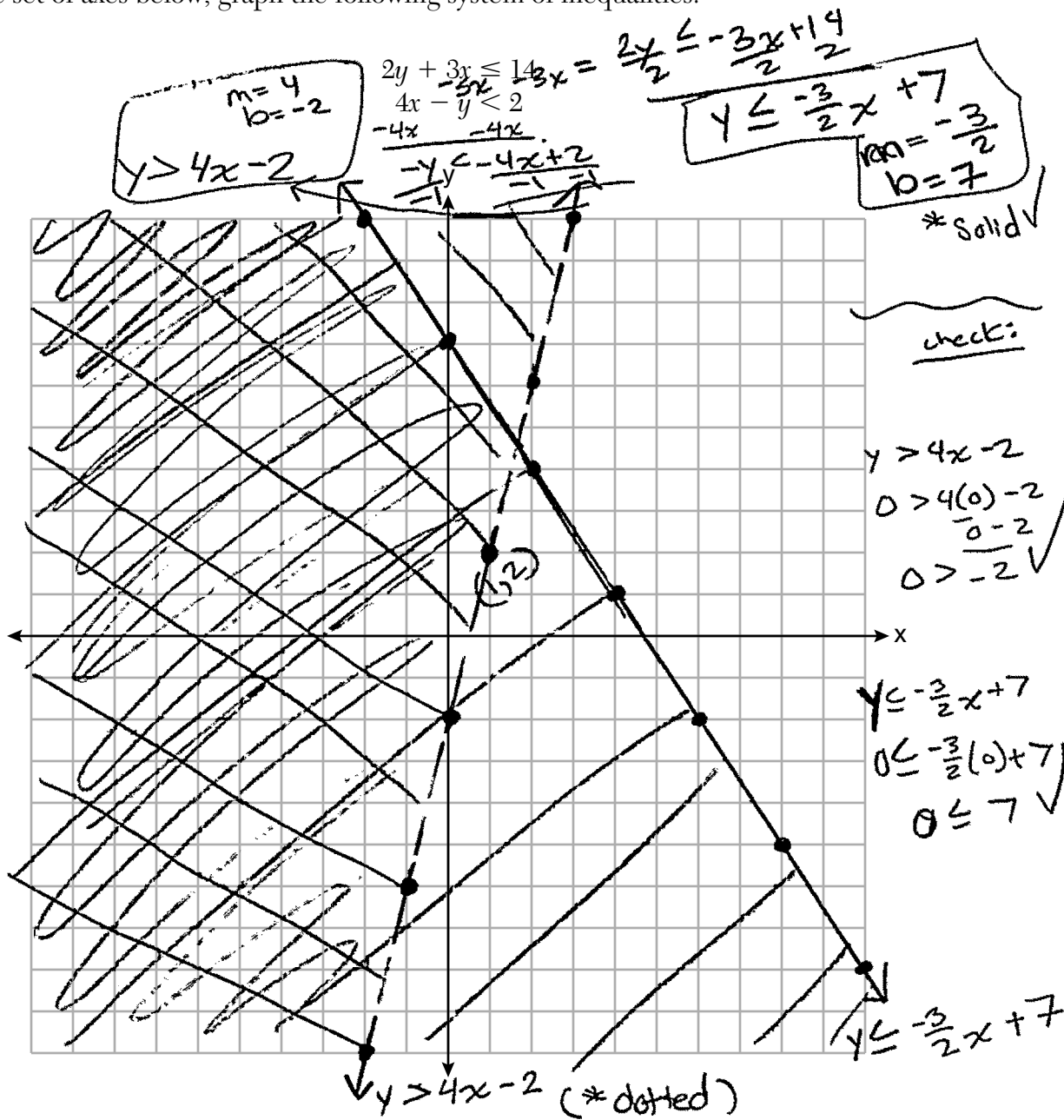
Garage A - 6 hours - \$26.00

Garage B - 8 hours - \$26.00

Score 0: The student gave a completely incorrect response.

Question 35

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



Determine if the point (1,2) is in the solution set. Explain your answer.

(1,2) is not in the solution set because it is on the dotted line, and therefore not a part of the solution.

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

Question 35

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

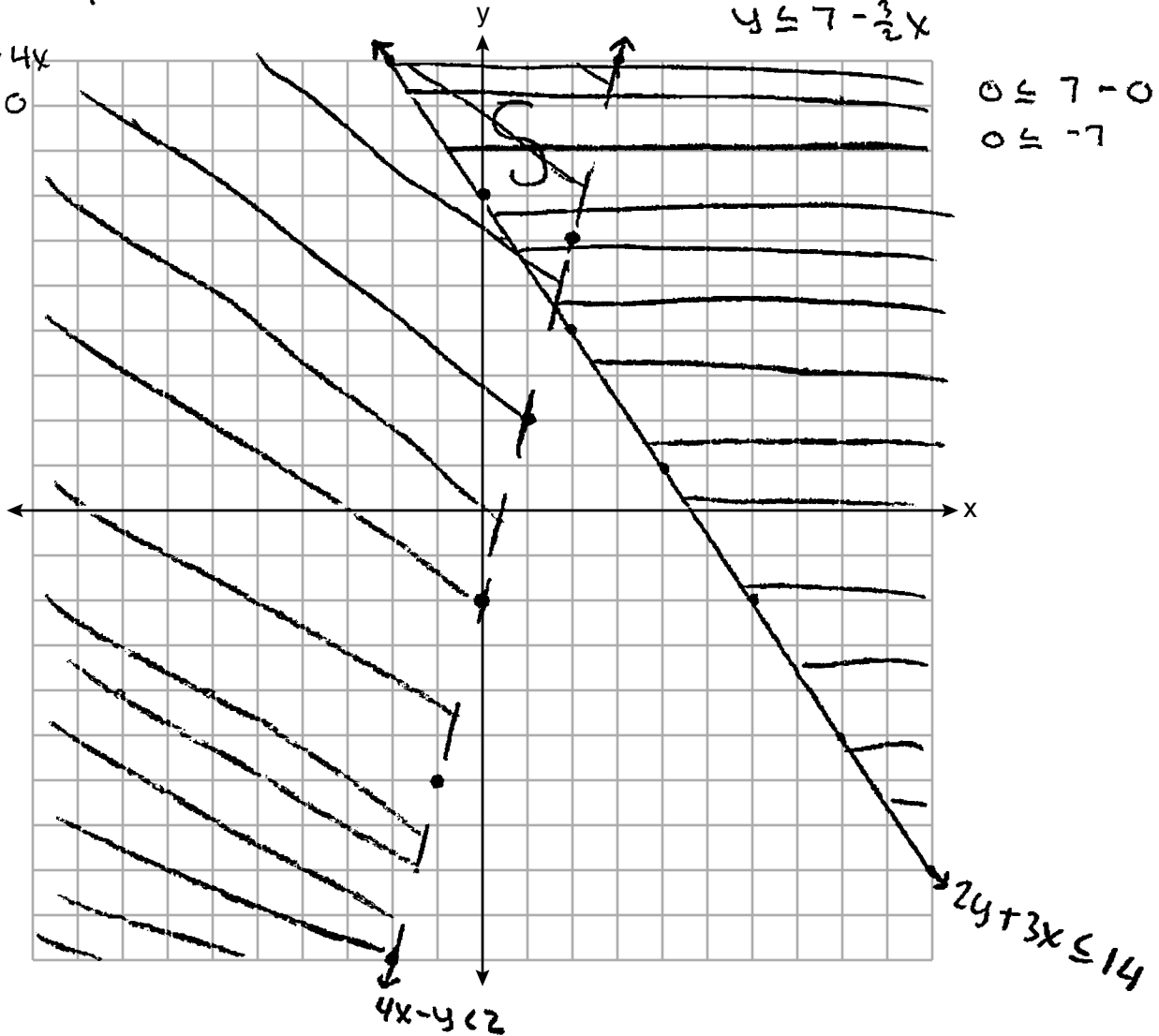
$$\begin{array}{r} 4x - y < 2 \\ -4x \qquad -4x \\ \hline -y < 2 - 4x \\ \hline -1 \qquad -1 \end{array}$$

$$\begin{array}{r} 2y + 3x \leq 14 \\ 4x - y < 2 \end{array}$$

$$\begin{array}{r} 2y + 3x \leq 14 \\ -3x \quad -3x \\ \hline 2y \leq \frac{14}{2} - \frac{3x}{2} \\ \hline y \leq 7 - \frac{3}{2}x \end{array}$$

$$\begin{array}{r} y > -2 + 4x \\ 0 > -2 + 0 \\ 0 > -2 \end{array}$$

$$\begin{array}{r} 0 \leq 7 - 0 \\ 0 \leq -7 \end{array}$$



Determine if the point (1,2) is in the solution set. Explain your answer.

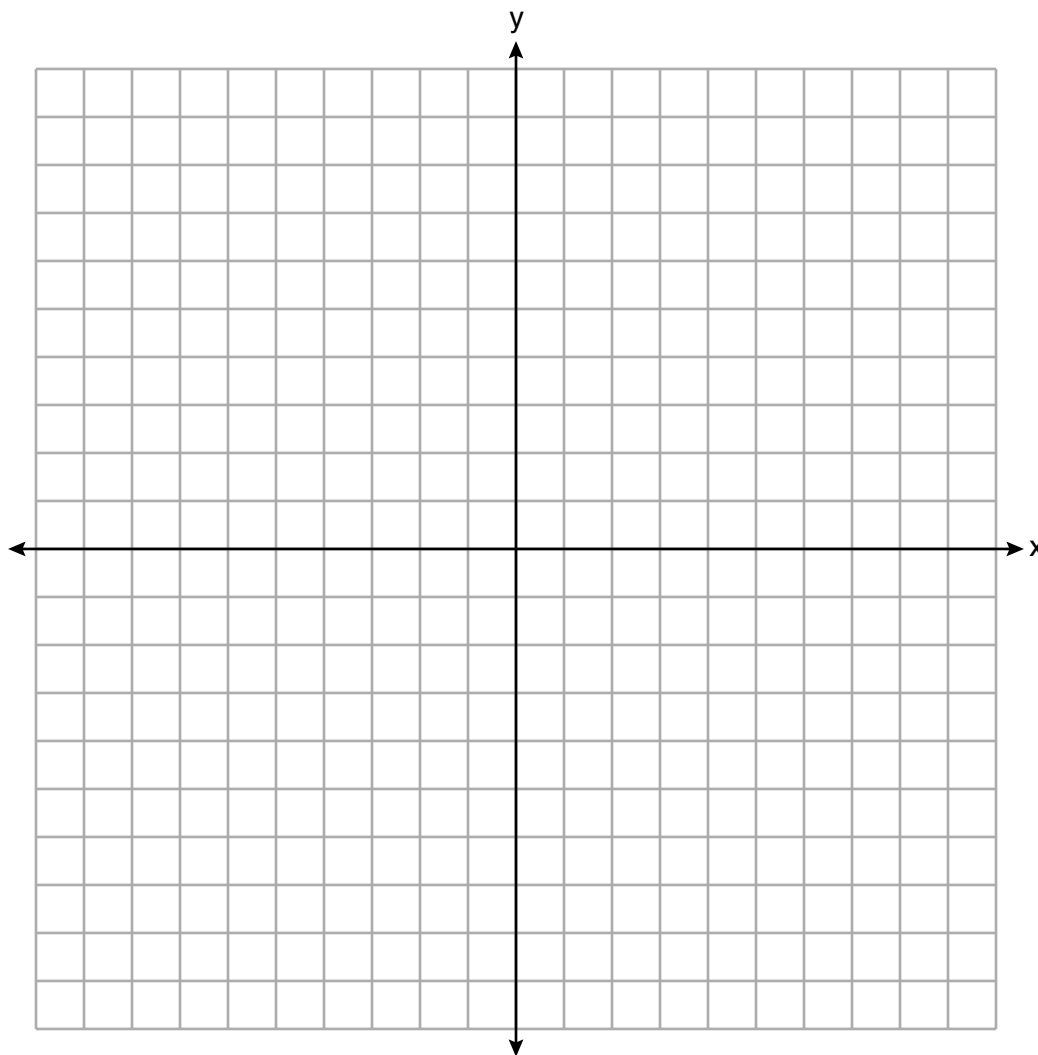
The point (1,2) is not a solution set because it does not fall into the shaded region of overlap between the 2 inequalities.

Score 3: The student shaded incorrectly for $2y + 3x \leq 14$, but wrote an appropriate explanation.

Question 35

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

$$\begin{aligned} 2y + 3x &\leq 14 \\ 4x - y &< 2 \end{aligned}$$



Determine if the point (1,2) is in the solution set. Explain your answer.

$$\begin{aligned} 2y + 3x &\leq 14 & 4x - y &< 2 \\ 2 \cdot 2 + 3 \cdot 1 &\leq 14 & 4 \cdot 1 - 2 &< 2 \\ 4 + 3 &\leq 14 & 4 - 2 &< 2 \\ 7 &\leq 14 \text{ OK} & 2 &< 2 \text{ NO} \end{aligned}$$

(1,2) does not work in both inequalities

Score 2: The student wrote an appropriate explanation.

Question 35

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

$$4x - y < 2 \quad \div -1 \quad \div -$$

$$-4x \quad -4x$$

$$2y + 3x \leq 14$$

$$4x - y < 2$$

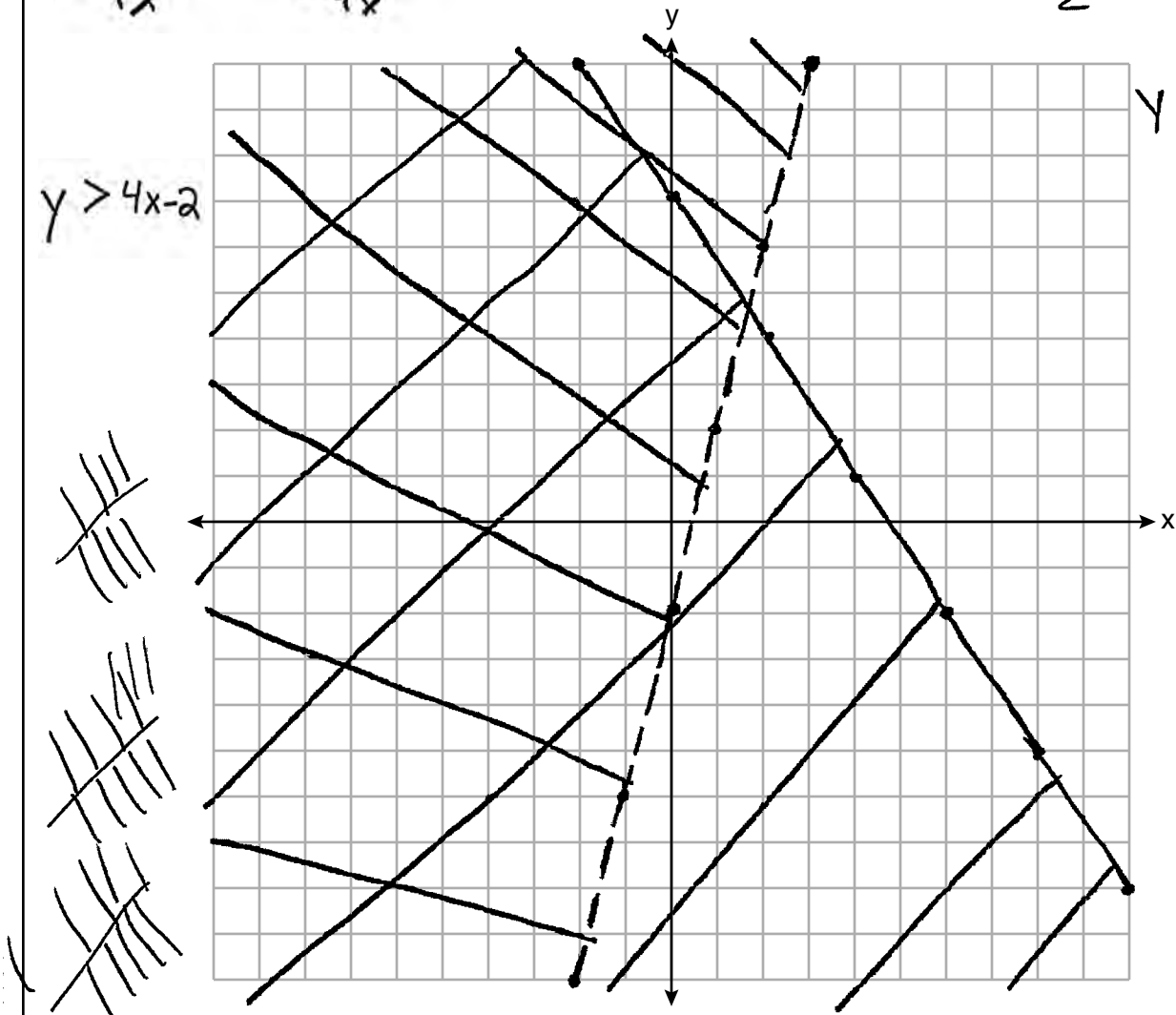
$$2y + 3x \leq 14$$

$$-3x$$

$$\frac{2y}{2} \leq \frac{-3x + 14}{2}$$

$$y \leq \frac{-3x + 14}{2} + 7$$

$$y > 4x - 2$$



Determine if the point (1,2) is in the solution set. Explain your answer.

Point (1,2)

Score 1: The student graphed both inequalities appropriately, but neither is labeled, and the explanation is missing.

Question 35

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

$$\begin{aligned} 2y + 3x &\leq 14 \\ 4x - y &< 2 \end{aligned}$$

$$\begin{array}{r} 2y + 3x \leq 14 \\ -3x \quad -3x \\ \hline 2y \leq -3x + 14 \end{array}$$

$$\frac{2y}{2} \leq \frac{-3x + 14}{2}$$

$$y \leq \frac{-3}{2}x + 7$$

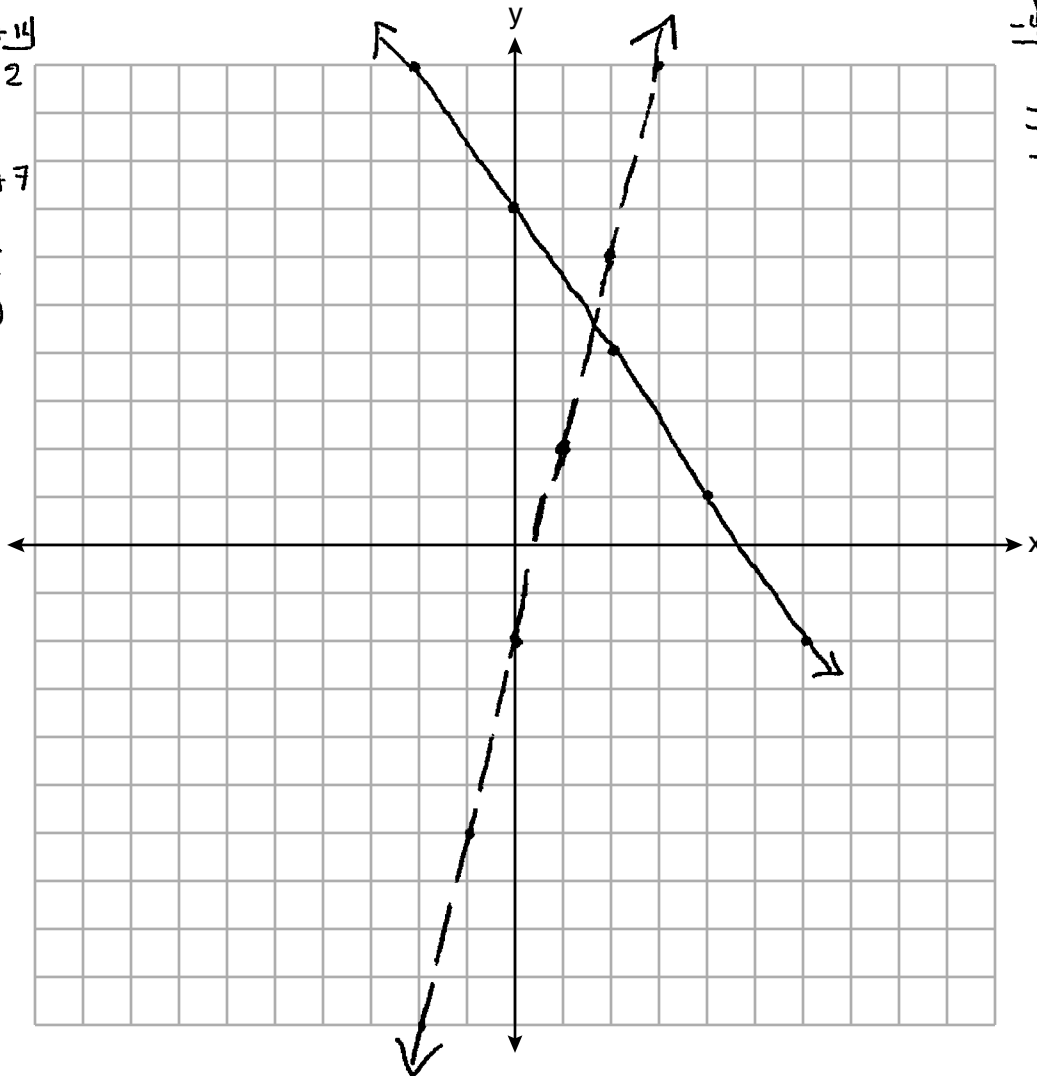
$$\begin{aligned} m &= \frac{-3}{2} \text{ AKA } \frac{3}{-2} \\ b &= 7; (0, 7) \end{aligned}$$

$$\begin{array}{r} 4x - y < 2 \\ -4x \quad -4x \\ \hline -y < -4x + 2 \end{array}$$

$$\frac{-y}{-1} < \frac{-4x + 2}{-1}$$

$$y > 4x - 2$$

$$\begin{aligned} m &= \frac{4}{1} \text{ AKA } \frac{4}{1} \\ b &= -2; (0, -2) \end{aligned}$$



Determine if the point (1,2) is in the solution set. Explain your answer.

Score 0: The student graphed both boundary lines correctly, but did not label either one.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

$$y = ax + b$$

$$y = .96x + 23.95$$

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

$$r = .92$$

It shows that there is a strong positive correlation between the 85+ students. So as the percent of students who scored 85+ on Math exams increases, so will the percent of students on English exams.

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

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the nearest hundredth.

$y = 0.957704x + 23.9456$

$y = 0.96x + 23.95$

State the correlation coefficient of the linear regression equation, to the nearest hundredth. Explain the meaning of this value in the context of these data.

0.920496

0.92

since the correlation coefficient is so close to one, the correlation between these two variables is very strong.

Score 3: The student did not write an explanation in context.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

$$y = ax + b$$
$$a = .96$$
$$b = 23.95$$

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

$$.92$$

Score 3: The student did not write an explanation.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

$$y = .96x + 23.95$$

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

The correlation coefficient of the linear regression is .96x because

Score 2: The student wrote a correct equation.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

$$.96x + 23.95$$

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

.92
how close the go to the line
strong

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

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

.92

Score 1: The student stated a correct correlation coefficient.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	English, y
27 (1)	46 (1)
12 (2)	28 (2)
13 (3)	45 (3)
40 (4)	34 (4)
30 (5)	56 (5)
45 (6)	67 (6)
20 (7)	42 (7)

Handwritten annotations: A bracket on the left groups the Mathematics column with the value 157. A bracket on the right groups the English column with the value 318.

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

total math scores: $\frac{157}{7} = 22.43$ | Total english scores: $\frac{318}{7} = 45.42$
 $318 - 157 = 161$
 (Equation: $y = 157x + 161$)

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

Correlation coefficient is 161 because 161 more people ~~got bet~~ got higher grades on the English test than the math. This could mean that people ~~do better on~~ are better at English rather than math.

Score 0: The student gave a completely incorrect response.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$$\begin{aligned}d + q &= 90 \\ .10d + .25q &= 17.55\end{aligned}$$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$$\begin{aligned}.10d + .25q &= 17.55 \\ d + q &= 90 \\ \cancel{-1d} - 25q &= -175.5 \\ \hline -1.5q &= -85.5 \\ \frac{-1.5q}{-1.5} &= \frac{-85.5}{-1.5} \\ q &= 57\end{aligned}$$

$$\begin{aligned}d + q &= 90 \\ d + 57 &= 90 \\ \hline -57 & -57 \\ d &= 33\end{aligned}$$

He has 57 quarters
and 33 dimes

$$\begin{aligned}.10d + .25q &= 17.55 \\ .10(33) + .25(57) &= 17.55 \\ 3.3 + 14.25 &= 17.55 \\ 17.55 &= 17.55 \quad \checkmark\end{aligned}$$

Question 37 is continued on the next page.

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

Question 37

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

$$\begin{array}{l} 33 \text{ dimes} \qquad 57 \text{ quarters} \\ 33 \cdot .25 = 8.25 \quad 57 \cdot .25 = 14.25 \end{array}$$

$$\begin{array}{r} 14.25 \\ + 8.25 \\ \hline 22.50 \end{array}$$
$$8\% \text{ tax} = 1.68$$
$$\begin{array}{r} 20.98 \\ * .08 \\ \hline 1.68 \end{array}$$

$$\begin{array}{r} 22.50 \\ - 1.68 \\ \hline \$20.82 \end{array}$$

Dylan will not have enough money,
he will be 16¢ short.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$$\begin{aligned} \text{let } x &= \text{number of quarters} & 0.25x + 0.10(90-x) &= 17.55 \\ \text{let } 90-x &= \text{number of dimes} \end{aligned}$$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$$0.25x + 9 - 0.10x = 17.55$$

$$\frac{0.15x}{0.15} = \frac{8.55}{0.15}$$

$$x = 57$$

57 quarters

Question 37 is continued on the next page.

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

Question 37

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

$$90 \cdot 0.25 = 22.50$$

$$20.98 \cdot 1.08 \approx 22.66$$

$$22.50 < 22.66$$

He wouldn't have enough money.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

let x = number of dimes let y = number of quarters

$$\begin{aligned}x + y &= 90 \\ 0.10x + 0.25y &= 17.55\end{aligned}$$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$$\begin{aligned}x + y &= 90 \\ -x & -x \\ \hline y &= 90 - x\end{aligned}$$
$$\begin{aligned}0.10x + 0.25(90 - x) &= 17.55 \\ 0.10x + 22.5 - 0.25x &= 17.55 \\ \frac{-0.15x}{-0.15} &= \frac{-4.95}{-0.15} \\ x &= 33\end{aligned}$$
$$\begin{aligned}33 + y &= 90 \\ -33 & -33 \\ \hline y &= 57 \\ \hline & \boxed{57 \text{ quarters}}\end{aligned}$$

Question 37 is continued on the next page.

Score 5: The student calculated the tax on \$22.50 instead of \$20.98.

Question 37

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

$$0.25(33) + 0.25(57) = 22.5$$

$$\frac{8}{100} = \frac{n}{22.5}$$

$$(8 \times 22.5) = 100n$$

$$\frac{180}{100} = \frac{100n}{100}$$

$$1.8 = n$$

$$22.5 - 1.8 = 20.7$$

$$20.7 < 20.98 \leftarrow$$

No he will not be able to buy it

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

let d = number of dimes
let q = number of quarters

$$\begin{aligned}d + q &= 90 \\ .10d + .25q &= 17.55\end{aligned}$$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

Dylan has
57
quarters

$$\begin{aligned}1(.10d + .25q) &= (17.55) | \\ - .10(d + q) &= (90.00) - .10 \\ \hline .10d + .25q &= 17.55 \\ - .10d - .10q &= -9.00 \\ \hline 0.15q &= 8.55 \\ \frac{0.15q}{0.15} &= \frac{8.55}{0.15} \\ q &= 57\end{aligned}$$

Question 37 is continued on the next page.

Score 4: The student showed appropriate work to find 57.

Question 37

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$$\begin{aligned}10d + 25q &= 17.55 \\ d + q &= 90\end{aligned}$$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$$d + q = \frac{90}{2} = 45$$

There are 45 quarters in total.

Question 37 is continued on the next page.

Score 3: The student wrote one correct equation and a correct justification.

Question 37

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

$$\begin{array}{r} 20.98 \\ \times 1.08 \\ \hline 22.66 \end{array}$$

$$10(0) + 25(90) = 2250$$

Dylan won't be able to buy the
Video game

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

$\overset{q}{Q}$ = quarters $\overset{d}{D}$ = dimes

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$.25n + .10n = 90$ $= \$17.55$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$$\begin{array}{r} 47 \\ +49 \\ \hline 96 \end{array}$$

57 quarters

* i couldn't figure this out, so trial and error on the calculator. *

$$\begin{array}{r} 52 \\ +38 \\ \hline 90 \end{array} \quad \begin{array}{r} 60 \\ +30 \\ \hline 90 \end{array} \quad \begin{array}{r} 58 \\ +32 \\ \hline 90 \end{array} \quad \begin{array}{r} 57 \\ +33 \\ \hline 90 \end{array}$$

Question 37 is continued on the next page.

Score 2: The student wrote an incorrect equation and used a method other than algebraic to determine 57. The student also made an error calculating tax.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

10¢ 25¢

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$$\begin{aligned} 17.55 &= 10x + 25y \\ 90 &= x + y \end{aligned}$$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$$\begin{aligned} 17.55 &= 10x + 25y \\ (10) \quad 90 &= x + y \\ \hline 17.55 &= 10x + 25y \\ - 900 &= 10x + 10y \\ \hline -882.45 &= 15y \\ \frac{-882.45}{15} &= \frac{15y}{15} \\ -58.83 &= y \end{aligned}$$

he has 12 quarters

Question 37 is continued on the next page.

Score 1: The student wrote one correct equation.

Question 37

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

He wouldn't make enough money with the added tax.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of \$17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

d = dimes
 q = quarters

$$90 = 10d + 25q$$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$$q = .10d + .25q$$

Question 37 is continued on the next page.

Score 0: The student gave a completely incorrect response.

Question 37

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at \$20.98 if he must also pay an 8% sales tax. Justify your answer.

yes

Regents Examination in Algebra I – June 2018

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

(Use for the June 2018 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	67	3
85	99	5	56	81	4	27	66	3
84	98	5	55	81	4	26	65	3
83	97	5	54	81	4	25	63	2
82	96	5	53	80	4	24	62	2
81	94	5	52	80	4	23	60	2
80	93	5	51	80	4	22	59	2
79	93	5	50	80	4	21	57	2
78	92	5	49	79	3	20	56	2
77	91	5	48	79	3	19	55	2
76	90	5	47	79	3	18	52	1
75	89	5	46	78	3	17	51	1
74	89	5	45	78	3	16	49	1
73	88	5	44	78	3	15	47	1
72	87	5	43	77	3	14	44	1
71	87	5	42	77	3	13	42	1
70	86	5	41	76	3	12	40	1
69	86	5	40	76	3	11	37	1
68	86	5	39	75	3	10	35	1
67	85	5	38	75	3	9	32	1
66	84	4	37	74	3	8	29	1
65	84	4	36	74	3	7	26	1
64	84	4	35	73	3	6	23	1
63	83	4	34	72	3	5	20	1
62	83	4	33	71	3	4	16	1
61	83	4	32	71	3	3	13	1
60	82	4	31	70	3	2	9	1
59	82	4	30	69	3	1	5	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.