ALGEBRA

II

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

ALGEBRA II

Tuesday, August 18, 2026 — 12:30 to 3:30 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 36 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. 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 expression $\frac{2}{3}\sqrt{-108}$ is equivalent to

(1) $-24\sqrt{3}$

(2) $-4\sqrt{3}$

(3) $4i\sqrt{3}$

(4) $24i\sqrt{3}$

2 Which statement is true about the graph of $y = \sqrt{9 - 2x}$?

(1) The x-intercept is (4, 0).

(2) The y-intercept is (0, 3).

(3) It is always increasing.

(4) The y-values are always negative.

3 An exponential function that contains the points (0, 20) and (1, 10) is

(1) $f(x) = 10(2)^x$

(2) $f(x) = 10(0.5)^x$

(3) $f(x) = 20(0.5)^x$

(4) $f(x) = 20(2)^x$

Use this space for computations.

4 If A and B are two events such that $P(A \text{ and } B) = 0.2$, $P(A) = 0.3$, and $P(B) = 0.4$, what is $P(A \text{ or } B)$?

(1) 0.9
(2) 0.7
(3) 0.5
(4) 0.1

5 Which value of x is in the solution set of $f(x) < g(x)$ if $f(x) = \sqrt[3]{x}$ and $g(x) = x^3 - 4x$?

(1) 1
(2) 2
(3) 0
(4) -1

6 Consider the recursive formula below.

$$a_1 = 200$$
$$a_n = (0.8)a_{n-1}$$

The value of a_4 is

(1) 202.4
(2) 159
(3) 102.4
(4) 81.92

Use this space for computations.

7 Antonella is solving a system of equations. Part of her work is shown below.

$$(x - 4)^2 + (y + 1)^2 = 25$$
$$y = -x + 4$$

Step 1: $(x - 4)^2 + (-x + 4 + 1)^2 = 25$

Step 2: $(x - 4)^2 + (-x + 5)^2 = 25$

Step 3: $x^2 - 8x + 16 - x^2 - 10x + 25 = 25$

Which statement best describes Antonella's work?

(1) In step 1, she substituted incorrectly.

(2) In step 2, she added incorrectly.

(3) In step 3, she multiplied incorrectly.

(4) Her work is correct.

8 Given $a > 0$ and $b > 0$, the expression $\frac{\sqrt{a^6b^5}}{\sqrt[3]{a^5b^3}}$ is equivalent to

(1) $a^{\frac{4}{3}}b^{\frac{3}{2}}$

(2) $a^{-\frac{4}{15}}b^{-\frac{3}{5}}$

(3) $(ab)^{\frac{17}{6}}$

(4) $a^{\frac{1}{3}}b^{\frac{2}{3}}$

Use this space for computations.

9 Which statement is true for the graph of $y = -x^3 - 2x^2 + 11x + 12$?

(1) As $x \to \infty$, $y \to -\infty$.

(2) -3 is a zero.

(3) It always increases on the interval $(-1, 3)$.

(4) $y > 0$ on the interval $(-4, -1)$.

10 The solution set to the equation $4x^{\frac{3}{2}} - 2 = 30$ is

(1) $\{16\sqrt{2}\}$

(2) $\{-4, 4\}$

(3) $\left\{\frac{16}{3}\right\}$

(4) $\{4\}$

11 The value of $2\tan\left(\frac{5\pi}{3}\right)$ is

(1) $\frac{-2}{\sqrt{3}}$

(2) $\frac{2}{\sqrt{3}}$

(3) $-2\sqrt{3}$

(4) $2\sqrt{3}$

Use this space for computations.

12 Mark purchased a new car for \$26,700. His new car depreciates 12% per year. Which equation models the value, $V(t)$, of Mark's car t years after he purchased it?

(1) $V(t) = 26{,}700(1.12)^{t-1}$

(2) $V(t) = 26{,}700(1.12)^{t}$

(3) $V(t) = 26{,}700(0.88)^{t-1}$

(4) $V(t) = 26{,}700(0.88)^{t}$

13 The table below shows the results of a survey of students regarding their favorite subject and whether or not they have pets at home.

	Math	Science	English	Social Studies	Total
Have Pets at Home	27	35	14	30	106
Do Not Have Pets at Home	52	49	28	15	144
Total	79	84	42	45	250

What is the probability, rounded to the *nearest thousandth*, that a randomly chosen student from this group prefers math and does not have pets at home?

(1) 0.208

(2) 0.316

(3) 0.658

(4) 0.892

Use this space for computations.

14 For the polynomial $p(x)$, it is determined that $p(5) = 0$. Which conclusion about $p(x)$ must be true?

(1) $x - 5$ is a factor of $p(x)$.

(2) $x + 5$ is a factor of $p(x)$.

(3) When $p(x)$ is divided by 5 the remainder is 0.

(4) $x = -5$ is a zero of $p(x)$.

15 Given $\sin(\theta) = \frac{21}{29}$ and θ is an angle in standard position that terminates in Quadrant II, what is the value of $\tan(\theta)$?

(1) $\frac{21}{20}$

(2) $-\frac{21}{20}$

(3) $-\frac{20}{29}$

(4) $\frac{29}{21}$

16 The solution set to the equation $\frac{6}{k} + \frac{k+2}{k+3} = \frac{2}{k^2+3k}$ is

(1) $\{-3, 0\}$

(2) $\{-4\}$

(3) $\{-4, 4\}$

(4) $\{4\}$

Use this space for computations.

17 The weights of 500 ketchup packets used by a restaurant chain are approximately normally distributed with a mean of 0.95 ounces and a standard deviation of 0.04 ounces. What is the approximate number of packets that weigh between 0.91 and 0.99 ounces?

(1) 68
(2) 79
(3) 341
(4) 475

18 A school counselor wants to estimate the proportion of the 503 juniors at her school who plan to attend a SUNY school. The counselor surveys 50 randomly chosen juniors at her school to ask about their post-graduation plans and finds that 38% of them plan to attend a SUNY school. What is the parameter of interest?

(1) the mean number of juniors who plan to attend a SUNY school
(2) the 38 students who responded yes to the survey
(3) the proportion of students who are not planning to attend a SUNY school
(4) the proportion of all juniors from this high school who plan to attend a SUNY school

Use this space for computations.

19 The sport of pickleball has grown by 59% over the three years from 2020 to 2023. The equation $P(t) = 5.6(1.59)^{\frac{t}{3}}$ can be used to model the number of people in a city playing pickleball, where $P(t)$ is measured in millions of people and t is measured in years since 2020. In terms of the yearly growth rate, the number of pickleball players could best be approximated by

(1) $P(t) = 5.6(1.167)^t$
(2) $P(t) = 5.6(1.167)^{3t}$
(3) $P(t) = 5.6(4.019)^t$
(4) $P(t) = 5.6(4.019)^{3t}$

20 The solutions to $\frac{x^2 + 7}{2} = -x$ are

(1) $-1 \pm i\sqrt{6}$
(2) $-2 \pm i\sqrt{6}$
(3) $-1 \pm 2i\sqrt{6}$
(4) $-1 \pm i\sqrt{3}$

21 The completely factored form of the expression $x^6 - 63x^3 - 64$ is

(1) $(x - 64)(x + 1)$
(2) $(x^3 - 64)(x^3 + 1)$
(3) $(x + 8)(x - 8)(x + 1)(x - 1)$
(4) $(x - 4)(x^2 + 4x + 16)(x + 1)(x^2 - x + 1)$

Use this space for computations.

22 Which function is odd?

(1) $y = \sin(2x)$

(2) $y = \sin(x) + 2$

(3) $y = \cos(-x)$

(4) $y = \cos(x)$

23 What is the inverse of $f(x) = 2^{x+1}$?

(1) $f^{-1}(x) = \log_2(x - 1)$

(2) $f^{-1}(x) = \log_2(x) - 1$

(3) $f^{-1}(x) = -2^{x+1}$

(4) $f^{-1}(x) = -2^{-x+1}$

24 Given $a > 0$ and $b > 0$, which function's graph has a period of $4b$ and a maximum of $2a$?

(1) $y = \frac{3a}{2}\cos(4bx) + \frac{a}{2}$

(2) $y = -\frac{3a}{2}\cos\left(\frac{\pi}{2b}x\right) + \frac{a}{2}$

(3) $y = a\cos(4bx) + a$

(4) $y = \cos\left(\frac{\pi}{2b}x\right) + 2a$

Part II

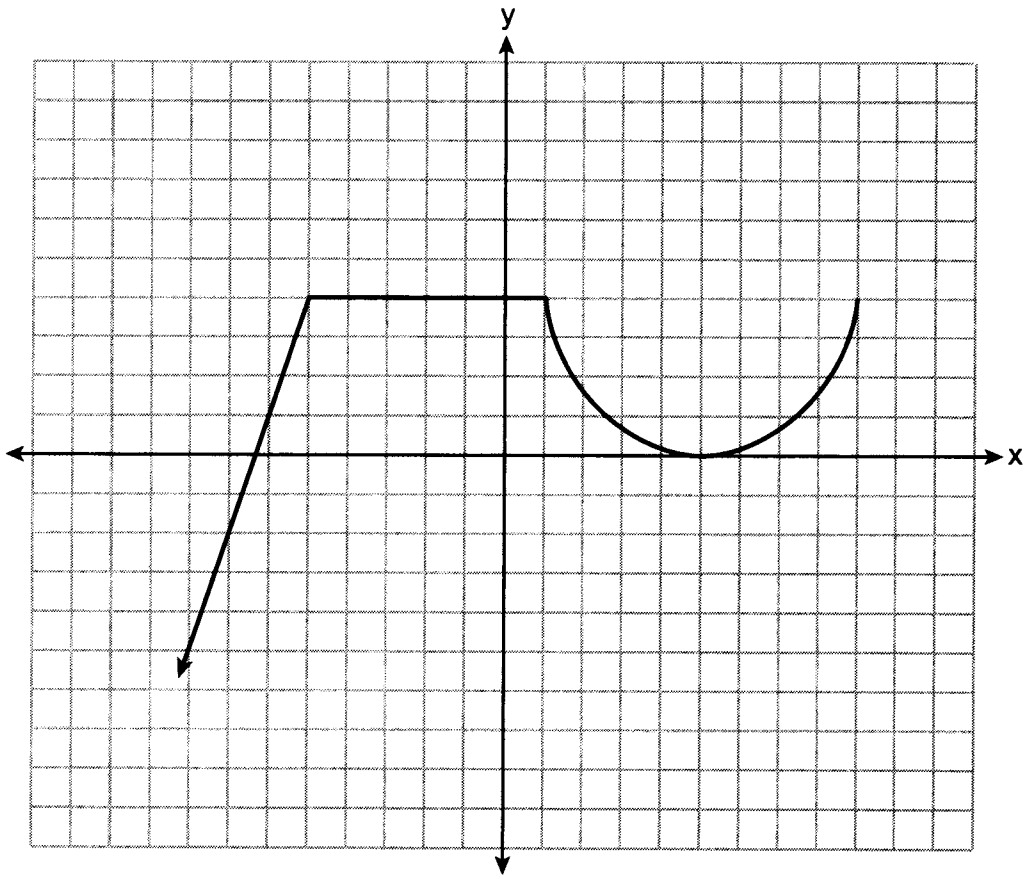
Answer all 8 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily 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 In order to keep the store properly stocked with produce, a grocery store manager wants to determine the most popular day of the week for people to buy apples and oranges. She randomly collects a sample of sales records for each day for three consecutive weeks. Is this type of data collection method a survey, an observational study, or an experiment? Explain your reasoning.

26 Given the following functions $f(x) = 2x^2 + 3x - 7$ and $g(x) = 2x - 5$, determine $f(x) - g(x)$, and express the result in standard form.

27 Determine algebraically the zeros of $f(x) = x^3 - 4x^2 - 9x + 36$.

28 The graph of $y = f(x)$ is shown below. On the same set of axes, graph $y = f(x + 3) - 4$.



29 Express $\left(-2 + \sqrt{-25}\right)^2$ in simplest $a + bi$ form. Justify your answer.

30 The most common radioactive form of cesium is cesium-137. The half-life of cesium-137 is 30 years.

Suppose 2.7 micrograms of cesium-137 are found in a soil sample. Write a function for the amount of cesium-137 remaining, $c(t)$, in micrograms, in terms of the number of years, t, since the soil sample was taken.

31 Solve algebraically for x:

$$\sum_{a=0}^{4} (ax - 3) = 5$$

32 Given the exponential function $y = 5.381e^{0.214x}$, rewrite the function in the form of $y = a(b)^x$, rounding values to the *nearest thousandth*.

Part III

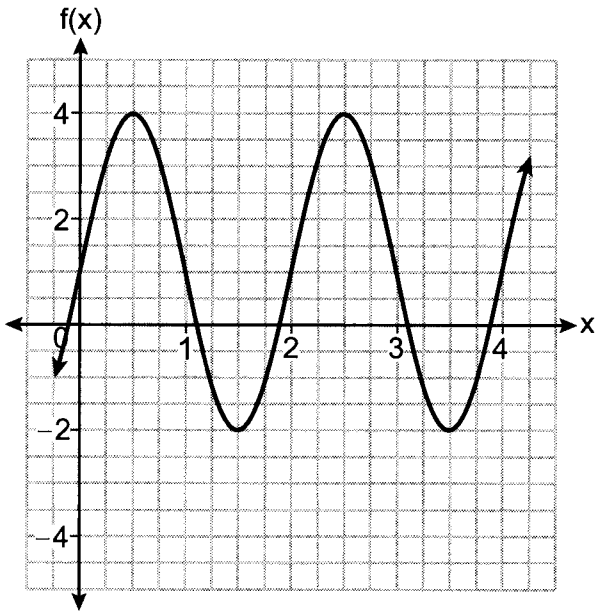
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily 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. [12]

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.

34 The sinusoidal function f is graphed below.

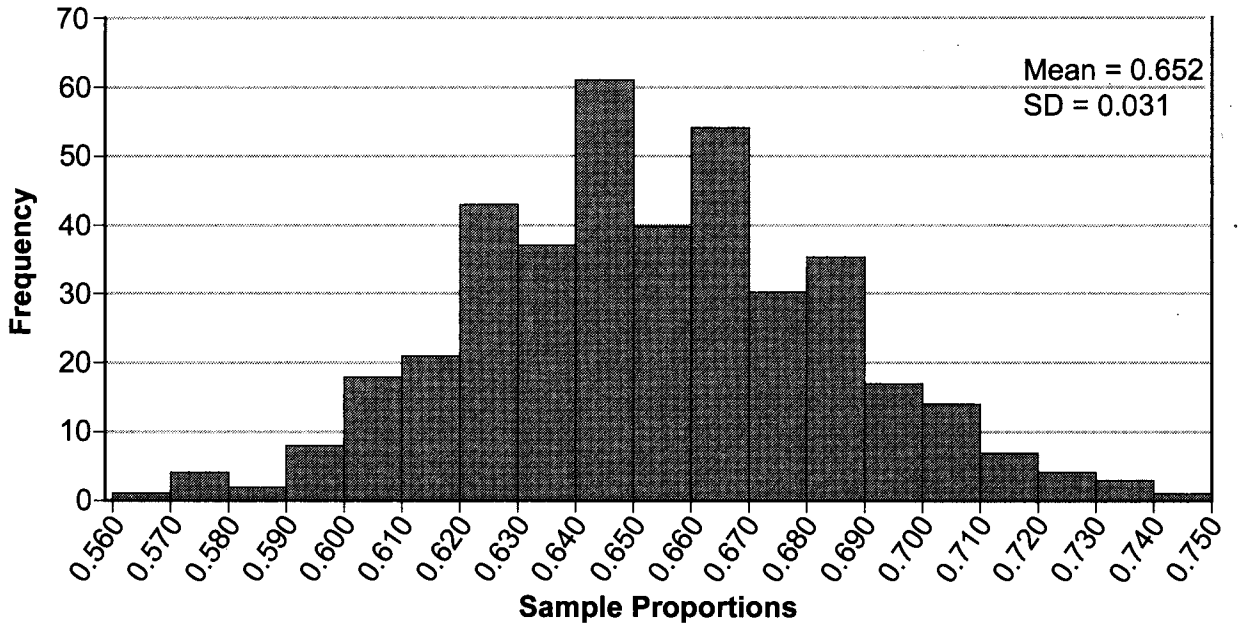


State the period of the function f.

State the amplitude of the function f.

Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

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]

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

Question 36 is continued on the next page.

Question 36 continued

Interpret the value of the average rate of change within the given context.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

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

Regents Examination in Algebra II – August 2026

Scoring Key: Part I (Multiple-Choice Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit
Algebra II	August '26	**1**	3	MC	2
Algebra II	August '26	**2**	2	MC	2
Algebra II	August '26	**3**	3	MC	2
Algebra II	August '26	**4**	3	MC	2
Algebra II	August '26	**5**	4	MC	2
Algebra II	August '26	**6**	3	MC	2
Algebra II	August '26	**7**	3	MC	2
Algebra II	August '26	**8**	1	MC	2
Algebra II	August '26	**9**	1	MC	2
Algebra II	August '26	**10**	4	MC	2
Algebra II	August '26	**11**	3	MC	2
Algebra II	August '26	**12**	4	MC	2
Algebra II	August '26	**13**	1	MC	2
Algebra II	August '26	**14**	1	MC	2
Algebra II	August '26	**15**	2	MC	2
Algebra II	August '26	**16**	2	MC	2
Algebra II	August '26	**17**	3	MC	2
Algebra II	August '26	**18**	4	MC	2
Algebra II	August '26	**19**	1	MC	2
Algebra II	August '26	**20**	1	MC	2
Algebra II	August '26	**21**	4	MC	2
Algebra II	August '26	**22**	1	MC	2
Algebra II	August '26	**23**	2	MC	2
Algebra II	August '26	**24**	2	MC	2

Regents Examination in Algebra II – August 2026

Scoring Key: Parts II, III, and IV (Constructed-Response Questions)

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

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

The chart for determining students' final examination scores for the **August 2026 Regents Examination in Algebra II** will be posted on the Department's web site at: https://www.nysedregents.org/algebratwo/ on the day of the examination. Conversion charts provided for the previous administrations of the Regents Examination in Algebra II must NOT be used to determine students' final scores for this administration.

FOR TEACHERS ONLY

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

ALGEBRA II

Tuesday, August 18, 2026 — 12:30 to 3:30 p.m., only

RATING GUIDE

Updated information regarding the rating of this examination may be posted on the New York State Education Department's website during the rating period. Check this website at: https://www.nysed.gov/state-assessment/high-school-regents-examinations 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 II. This guidance is intended to be part of the scorer training. Schools should use the Model Response Set along with the rubrics in the Rating Guide to help guide scoring of student work. 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 website at https://www.nysedregents.org/algebratwo/.

Mechanics of Rating

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

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 website at: https://www.nysed.gov/state-assessment/high-school-regents-examinations on the day of the examination. Because scale scores corrsponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score. The student's scale score should be entered in the box provided on the student's separate answer sheet. The scale score is the student's final examination score.

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examination in Algebra II 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 *Directions for Scoring Regents Examinations*, 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]** Observational study, and a correct explanation is written.

[1] Observational study, but the explanation is incomplete.

[0] Observational study, but the explanation is incorrect or missing.

or

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(26) **[2]** $2x^2 + x - 2$, and correct work is shown.

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

or

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

or

[1] Appropriate work is shown, but the polynomial is not written in standard form.

or

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

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(27) **[2]** ± 3, 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] $(x - 4)(x + 3)(x - 3)$ is written, but no further correct work is shown.

or

[1] ± 3, 4, but a method other than algebraic is used.

or

[1] ± 3, 4, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, 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 does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(29) **[2]** $-21 - 20i$ or equivalent, and a correct justification is given.

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

or

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

or

[1] $-21 - 20i$, but the justification is incomplete, incorrect, or missing.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(30) **[2]** $c(t) = 2.7\left(\frac{1}{2}\right)^{\frac{t}{30}}$ or equivalent.

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

or

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

or

[1] $2.7\left(\frac{1}{2}\right)^{\frac{t}{30}}$ is stated.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(31) **[2]** 2, and correct algebraic 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] 2, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(32) **[2]** $y = 5.381(1.239)^x$

[1] One computational, notation, or rounding error is made.

or

[1] One conceptual error is made.

or

[1] $5.381(1.239)^x$ is stated.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, 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]** $2x^2 - 6x + 1 - \frac{3}{x^2 + 3x - 5}$ or equivalent, and correct work is shown.

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

or

[3] Appropriate work is shown, but the result is not expressed in the form $q(x) + \frac{r(x)}{d(x)}$.

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

or

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

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

or

[1] $2x^2 - 6x + 1 - \frac{3}{x^2 + 3x - 5}$, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(34) **[4]** 2, 3, $f(x) = 3\sin(\pi x) + 1$, or equivalent.

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

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

or

[2] 2 and 3, but no further correct work is shown.

or

[2] $f(x) = 3\sin(\pi x) + 1$, but no further correct work is shown.

[1] 2 or 3, but no further correct work is shown.

or

[1] $3\sin(\pi x) + 1$, but no further correct work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(35) **[4]** (0.59, 0.71) or equivalent, correct work is shown, a negative response is indicated, and a correct explanation is written.

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

or

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

[2] Appropriate work is shown to find the interval, but no further correct work is shown.

or

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

[1] (0.59, 0.71), but no work is shown.

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

or

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, 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.

(36) **[6]** 184, correct work is shown to find −4.5, and a correct interpretation is written, and 19.2, and correct work is shown.

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

or

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

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

[3] Appropriate work is shown to find −4.5, and a correct interpretation is written, but no further correct work is shown.

[2] Appropriate work is shown to find −4.5, but no further correct work is shown.

or

[2] Appropriate work is shown to find 19.2, but no further correct work is shown.

[1] 184 is stated, but no further correct work is shown.

or

[1] A correct interpretation is written, but no further correct work is shown.

or

[1] −4.5 or 19.2, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

Map to the Learning Standards
Algebra II
August 2026

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

21	Multiple Choice	2	A-SSE.A
22	Multiple Choice	2	F-TF.A
23	Multiple Choice	2	F-BF.B
24	Multiple Choice	2	F-TF.B
25	Constructed Response	2	S-IC.B
26	Constructed Response	2	F-BF.A
27	Constructed Response	2	A-APR.B
28	Constructed Response	2	F-BF.B
29	Constructed Response	2	N-CN.A
30	Constructed Response	2	F-BF.A
31	Constructed Response	2	F-BF.B
32	Constructed Response	2	A-SSE.B
33	Constructed Response	4	A-APR.D
34	Constructed Response	4	F-TF.B
35	Constructed Response	4	S-IC.B
36	Constructed Response	6	F-IF.B

The *Chart for Determining the Final Examination Score for the August 2026 Regents Examination in Algebra II* will be posted on the Department's website at: https://www.nysed.gov/state-assessment/high-school-regents-examinations on the day of the examination. Conversion charts provided for previous administrations of the Regents Examination in Algebra II 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 https://www.nysed.gov/state-assessment/teacher-feedback-state-assessments.

2. Click Regents Examinations.

3. Complete the required demographic fields.

4. Select the test title from the Regents Examination dropdown list.

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

6. 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 II

Tuesday, August 18, 2026 — 12:30 to 3:30 p.m., only

MODEL RESPONSE SET

Table of Contents

Question 25

25 In order to keep the store properly stocked with produce, a grocery store manager wants to determine the most popular day of the week for people to buy apples and oranges. She randomly collects a sample of sales records for each day for three consecutive weeks. Is this type of data collection method a survey, an observational study, or an experiment? Explain your reasoning.

it is an observational study because she isn't doing an experiment with a control group and experimentation group, she isn't surveying people on when they enter the store or buy apples, but is just collecting data that she observes in the store

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

Question 25

25 In order to keep the store properly stocked with produce, a grocery store manager wants to determine the most popular day of the week for people to buy apples and oranges. She randomly collects a sample of sales records for each day for three consecutive weeks. Is this type of data collection method a survey, an observational study, or an experiment? Explain your reasoning.

It's an observational study, because the manager isn't asking anyone about their preferences neither he is changing conditions of the experiment, so I can eliminate these two options. What I'm left with is an observational study.

Answer: observational study.

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

Question 25

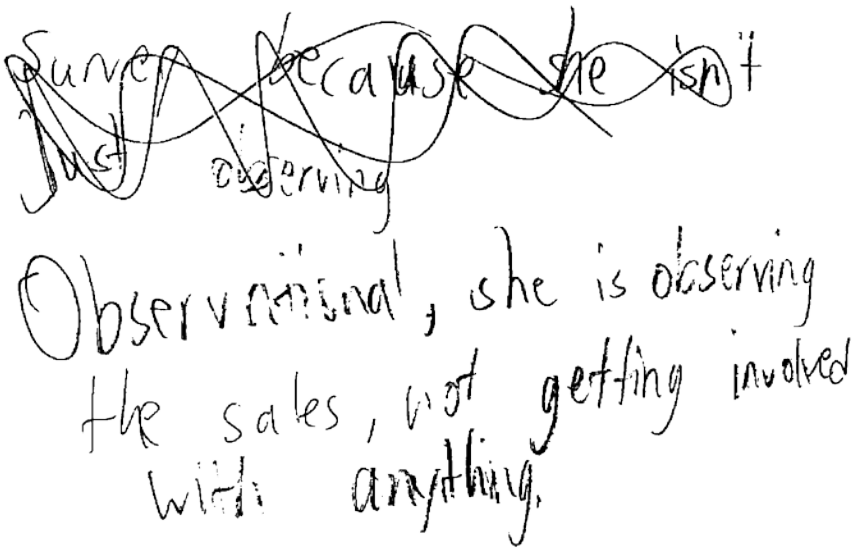
25 In order to keep the store properly stocked with produce, a grocery store manager wants to determine the most popular day of the week for people to buy apples and oranges. She randomly collects a sample of sales records for each day for three consecutive weeks. Is this type of data collection method a survey, an observational study, or an experiment? Explain your reasoning.

This study is an observational study because she is not changing any variables.

Score 1: The student's explanation is incomplete.

Question 25

25 In order to keep the store properly stocked with produce, a grocery store manager wants to determine the most popular day of the week for people to buy apples and oranges. She randomly collects a sample of sales records for each day for three consecutive weeks. Is this type of data collection method a survey, an observational study, or an experiment? Explain your reasoning.



Score 1: The student's explanation is incomplete.

Question 25

25 In order to keep the store properly stocked with produce, a grocery store manager wants to determine the most popular day of the week for people to buy apples and oranges. She randomly collects a sample of sales records for each day for three consecutive weeks. Is this type of data collection method a survey, an observational study, or an experiment? Explain your reasoning.

Experiment because they are collecting data of a certain item for each day for three consecutive weeks so it is an experiment cause you are trying to find something out by using data over a certain period of time.

Score 0: The student did not satisfy the criteria for one or more credits.

Question 25

25 In order to keep the store properly stocked with produce, a grocery store manager wants to determine the most popular day of the week for people to buy apples and oranges. She randomly collects a sample of sales records for each day for three consecutive weeks. Is this type of data collection method a survey, an observational study, or an experiment? Explain your reasoning.

This is a survey
because she is
trying to figure
out what she needs
to do not what
is happening
(observ. & exper.)
She needs this
information
to do something
not just study it

Score 0: The student did not satisfy the criteria for one or more credits.

Question 26

26 Given the following functions $f(x) = 2x^2 + 3x - 7$ and $g(x) = 2x - 5$, determine $f(x) - g(x)$, and express the result in standard form.

$f(x) - g(x) = (2x^2+3x-7) - (2x-5)$

$= 2x^2+3x-7-2x+5$

$= 2x^2+x-2$

$\boxed{2x^2+x-2}$

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

Question 26

26 Given the following functions $f(x) = 2x^2 + 3x - 7$ and $g(x) = 2x - 5$, determine $f(x) - g(x)$, and express the result in standard form.

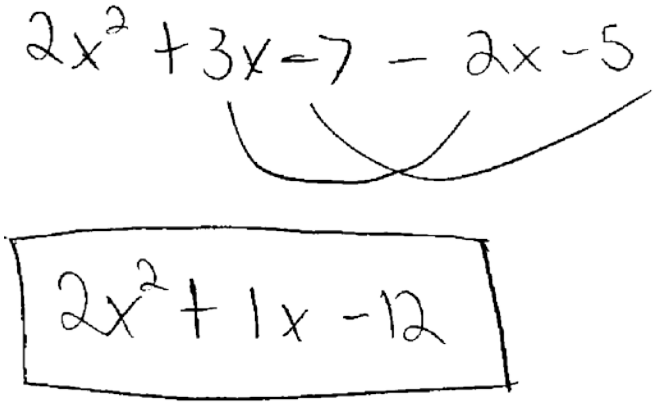
$$(2x^2+3x-7)-(2x-5)$$

$$2x^2+3x-7$$
$$-2x+5$$
$$2x^2+x-2$$

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

Question 26

26 Given the following functions $f(x) = 2x^2 + 3x - 7$ and $g(x) = 2x - 5$, determine $f(x) - g(x)$, and express the result in standard form.



Score 1: The student made a computational error.

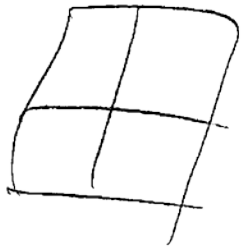
Question 26

26 Given the following functions $f(x) = 2x^2 + 3x - 7$ and $g(x) = 2x - 5$, determine $f(x) - g(x)$, and express the result in standard form.

$(2x^2+3x-7)-(2x-5)$

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

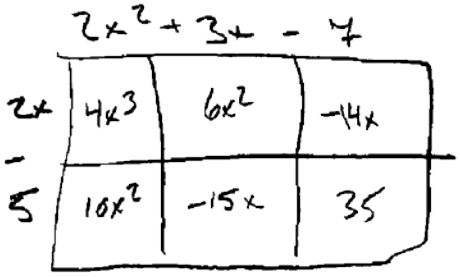
$2x^2+x+3$



Score 1: The student made a computational error.

Question 26

26 Given the following functions $f(x) = 2x^2 + 3x - 7$ and $g(x) = 2x - 5$, determine $f(x) - g(x)$, and express the result in standard form.



$4x^3 + 6x^2 - 14x + 10x^2 - 15x + 35$

$4x^3 + 16x^2$

Score 0: The student made multiple errors.

Question 26

26 Given the following functions $f(x) = 2x^2 + 3x - 7$ and $g(x) = 2x - 5$, determine $f(x) - g(x)$, and express the result in standard form.

$2x^2+3x-7=0$

$-(2x-5)$

$2x^2+5x-2=0$

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

$\frac{-5\pm\sqrt{9}}{4}$

$\frac{-5\pm3}{4}$

$\frac{-5}{4}\pm\frac{3}{4}$

$-\frac{5}{4}+\frac{3}{4}$ $\quad -\frac{5}{4}-\frac{3}{4}$

$\frac{-2}{4}$ $\quad \frac{-8}{4}$

$-\frac{1}{2}$ $\quad -2$

$2(-2)-5=-9$

$2(-2)^2+3(-2)-7=-5$

$2(-\frac{1}{2})^2+3(-\frac{1}{2})+7=6$

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

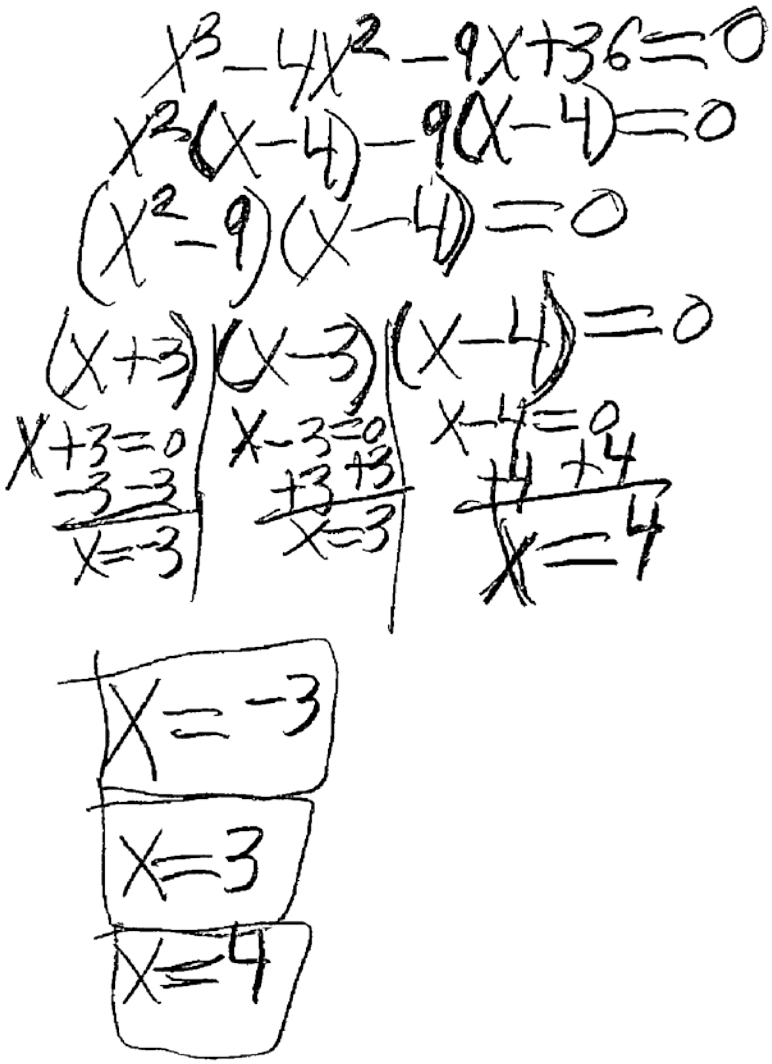
$6-(-6)=12$

$-5-(-9)=4$

Score 0: The student did not satisfy the criteria for one or more credits.

Question 27

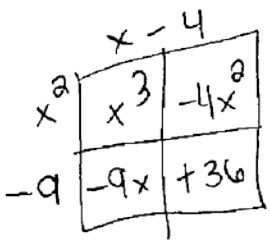
27 Determine algebraically the zeros of $f(x) = x^3 - 4x^2 - 9x + 36$.



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

Question 27

27 Determine algebraically the zeros of $f(x) = x^3 - 4x^2 - 9x + 36$.



$f(x) = x^3 - 4x^2 - 9x + 36$

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

$0 = (x-4)(x+3)(x-3)$

$x-4=0$ $\quad x+3=0$ $\quad x-3=0$

$+4\ +4$ $\quad -3\ -3$ $\quad +3\ +3$

$x=4$ $\quad x=-3$ $\quad x=3$

$f(4) = 4^3 - 4(4)^2 - 9(4) + 36 = 0$

$f(-3) = -3^3 - 4(-3)^2 - 9(-3) + 36 = 0$

$f(3) = 3^3 - 4(3)^2 - 9(3) + 36 = 0$

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

Question 27

27 Determine algebraically the zeros of $f(x) = x^3 - 4x^2 - 9x + 36$.

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ $a=1$ $b=-4$

	x	-4
x^2	x^3	$-4x^2$
-9	$-9x$	$+36$

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

$(x-4)(x-3)(x+3)$

$x+4 \quad x-3 \quad x+3$

$\{-4, +3, -3\}$

Score 1: The student reached a benchmark for one credit.

Question 27

27 Determine algebraically the zeros of $f(x) = x^3 - 4x^2 - 9x + 36$.

$x^3 - 4x^2 - 9x + 36 = 0$

$x^2(x-4) - 9(x-4) = 0$

$(x^2-9)(x-4) = 0$

$(x+3)(x-3)(x-4) = 0$

$\{\pm 3, 4.03\}$

Score 1: The student incorrectly included zero as part of the solution.

Question 27

27 Determine algebraically the zeros of $f(x) = x^3 - 4x^2 - 9x + 36$.

$x^3 - 4x^2$

$x^2(x-4)$

$x^2(x+2)(x-2)$

$-9x + 36$

$-9(x-4)$

$-9(x+2)(x-2)$

$(x^2-9)(x+2)(x-2)(x+2)(x-2)$

$(x+3)(x-3)(x+2)(x-2)(x+2)(x-2)$

$x-2=0$ $x-3=0$ $x+2=0$ $x+3=0$

$+2$ $+3$ -2 -3

$x=2$ $x=3$ $x=-2$ $x=-3$

Score 0: The student made multiple errors.

Question 27

27 Determine algebraically the zeros of $f(x) = x^3 - 4x^2 - 9x + 36$.

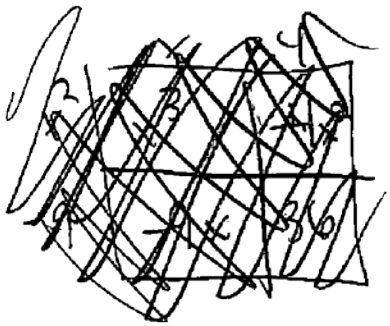
$x^2(x-4)-9(x-4)$

$(\sqrt{x^2}\sqrt{9})(x-4)$

$(x-9)(x+9)$

$x = 9$

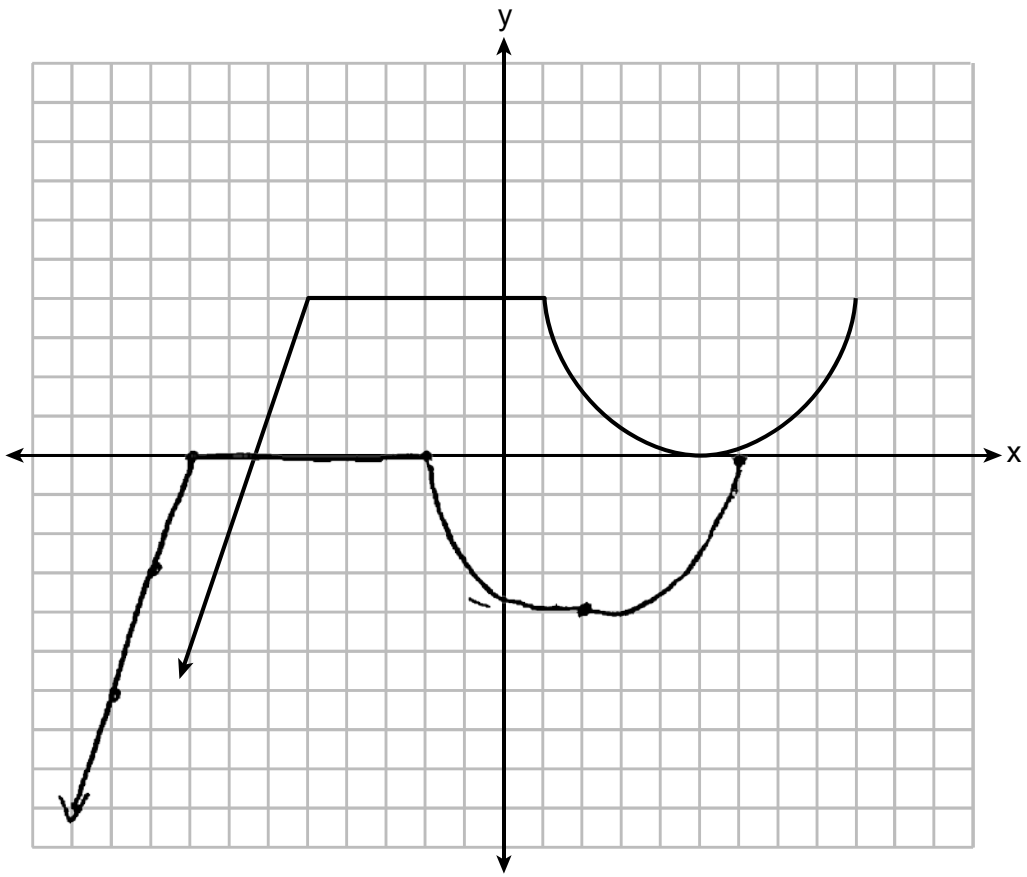
$x = -9$



Score 0: The student did not satisfy the criteria for one or more credits.

Question 28

28 The graph of $y = f(x)$ is shown below. On the same set of axes, graph $y = f(x + 3) - 4$.

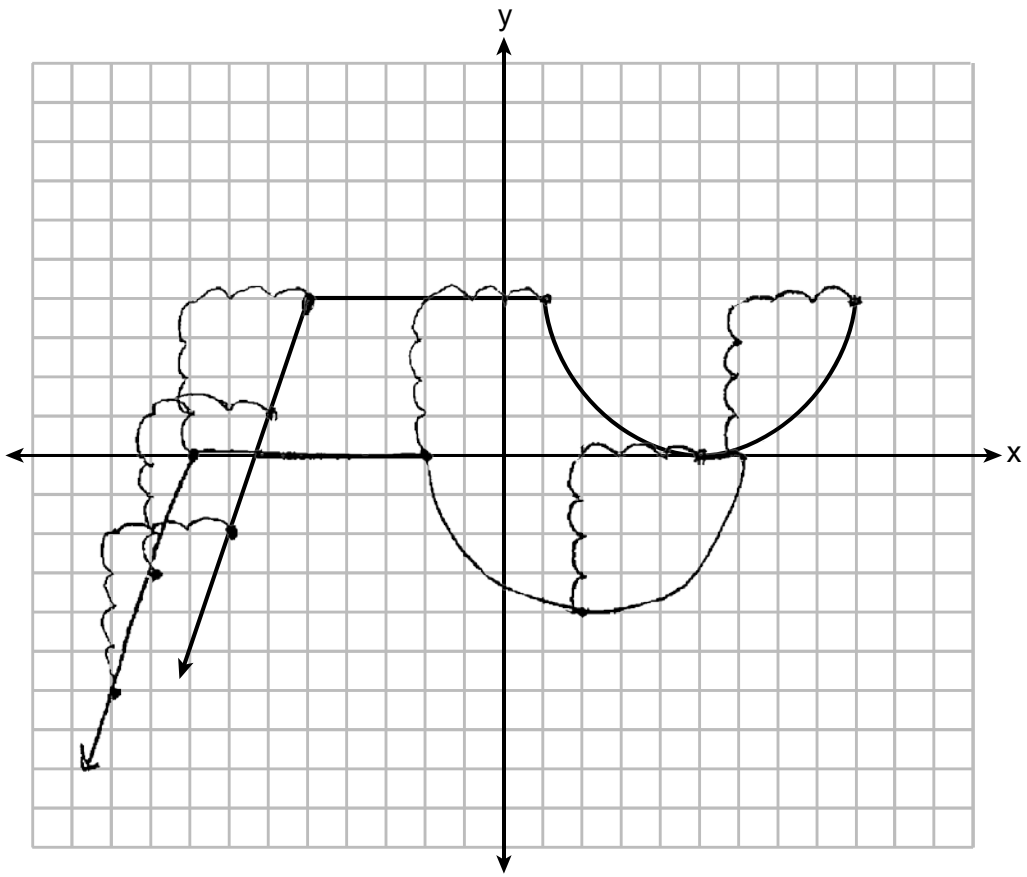


left 3 down 4

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

Question 28

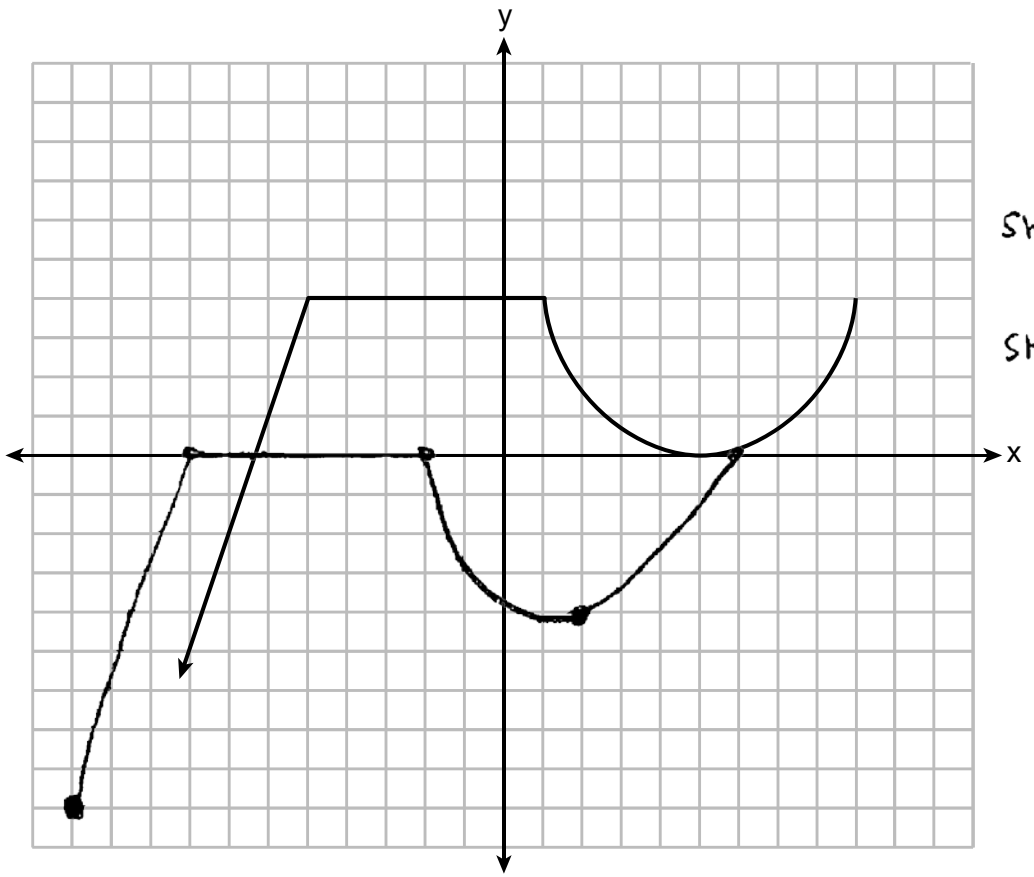
28 The graph of $y = f(x)$ is shown below. On the same set of axes, graph $y = f(x + 3) - 4$.



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

Question 28

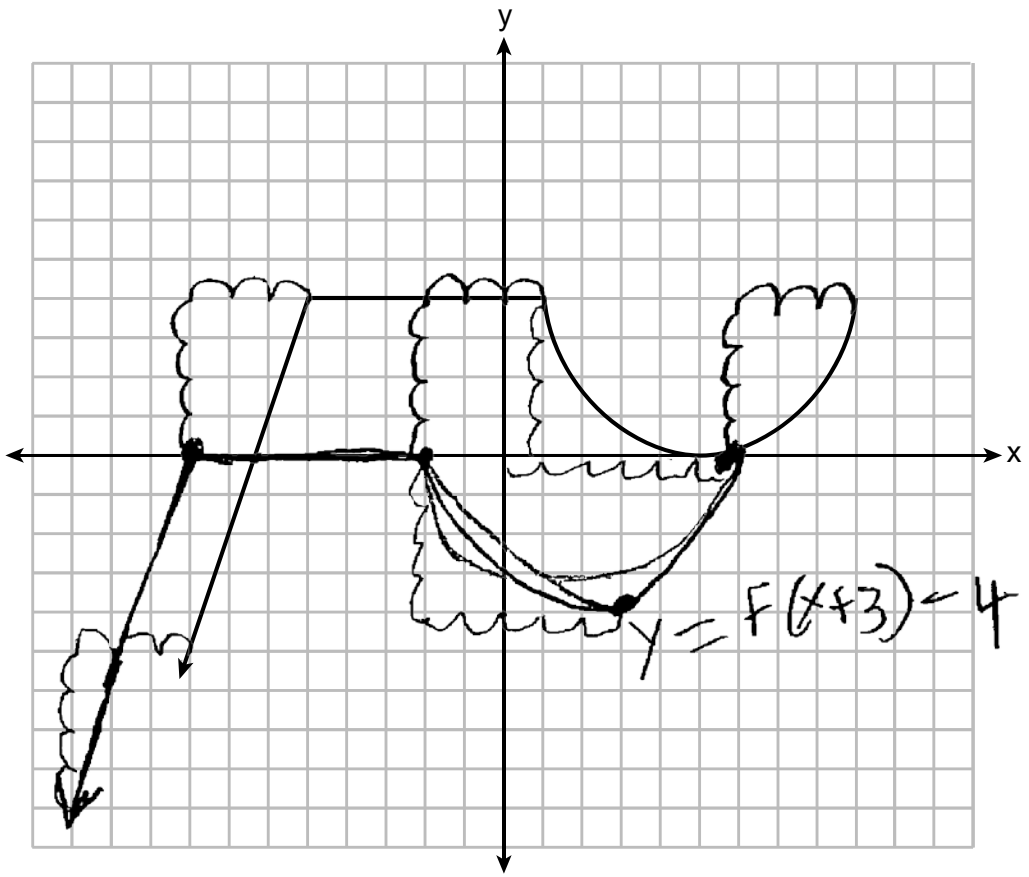
28 The graph of $y = f(x)$ is shown below. On the same set of axes, graph $y = f(x + 3) - 4$.



Score 1: The student did not draw an arrow.

Question 28

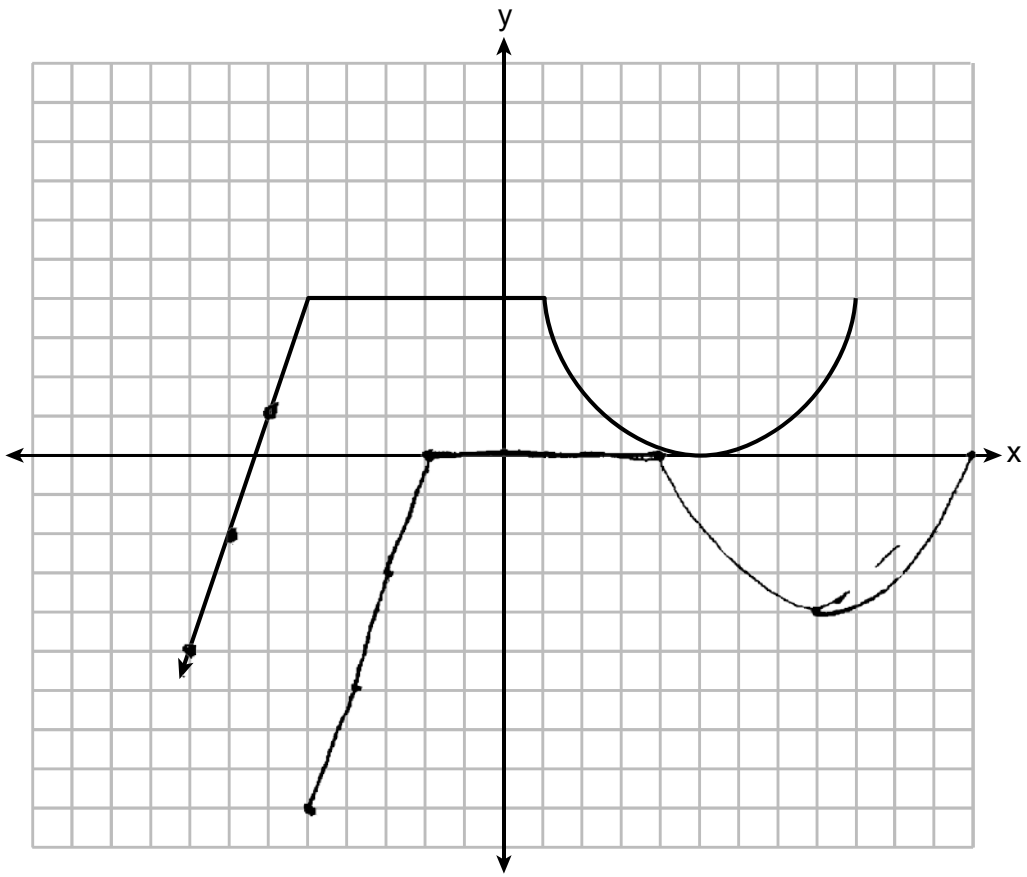
28 The graph of $y = f(x)$ is shown below. On the same set of axes, graph $y = f(x + 3) - 4$.



Score 1: The student made a graphing error translating the semicircle.

Question 28

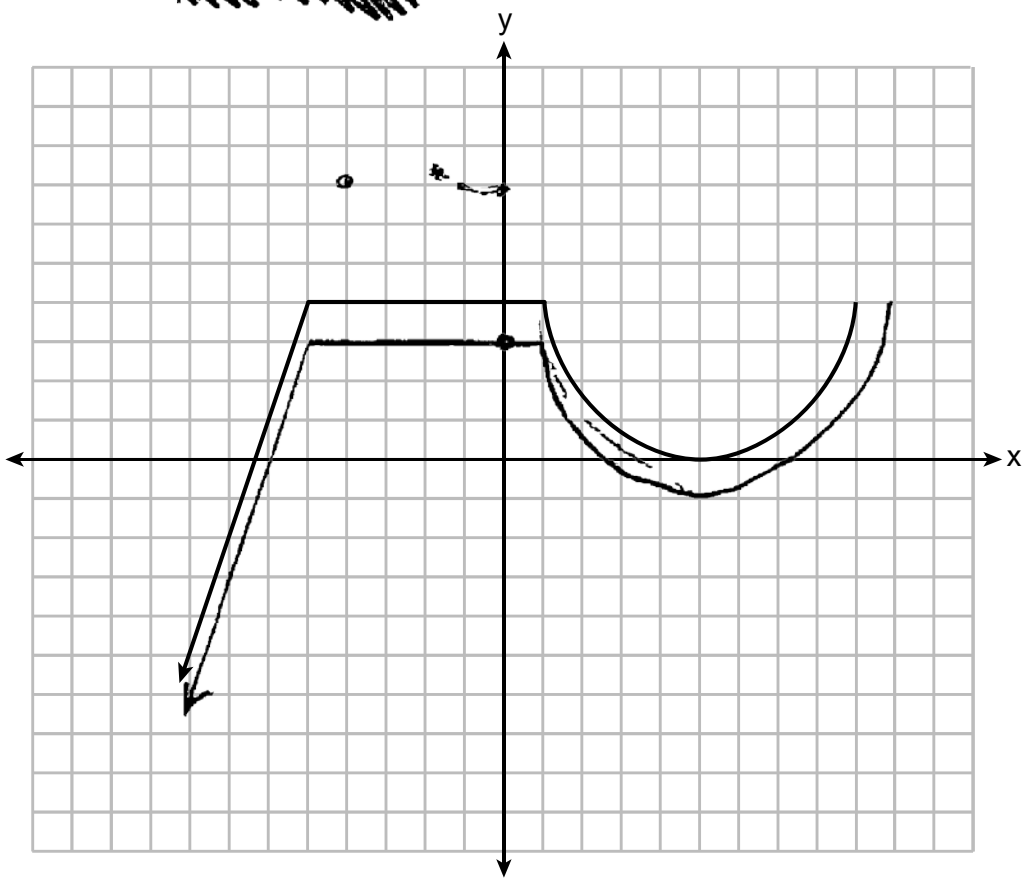
28 The graph of $y = f(x)$ is shown below. On the same set of axes, graph $y = f(x + 3) - 4$.



Score 0: The student made multiple graphing errors.

Question 28

28 The graph of $y = f(x)$ is shown below. On the same set of axes, graph $y = f(x + 3) - 4$.



Score 0: The student made multiple graphing errors.

Question 29

29 Express $\left(-2 + \sqrt{-25}\right)^2$ in simplest $a + bi$ form. Justify your answer.

$(-2+5i)^2$

$(-2+5i)(-2+5i)$

$4 - 10i - 10i + 25i^2$

$-21 + (-20i)$

$25i^2 - 20i + 4$

$-25 - 20i + 4$

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

Question 29

29 Express $\left(-2 + \sqrt{-25}\right)^2$ in simplest $a + bi$ form. Justify your answer.

$(-2+5i)^2$

$(-2+5i)(-2+5i)$

$4 - 10i - 10i - 25$

$-20i - 21$

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

Question 29

29 Express $\left(-2 + \sqrt{-25}\right)^2$ in simplest $a + bi$ form. Justify your answer.

$(-2 + \sqrt{-25})(-2 + \sqrt{-25})$

$4 - 2\sqrt{-25} - 2\sqrt{-25} - 25$

$-4\sqrt{-25} - 21$

$-9i(5) - 21$

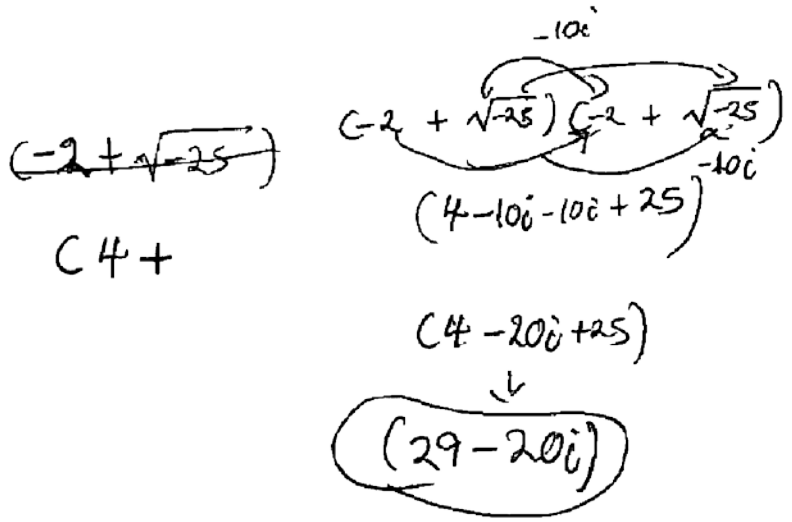
$-21 - 20i$

$21 + 20i$

Score 1: The student's final answer is incorrect.

Question 29

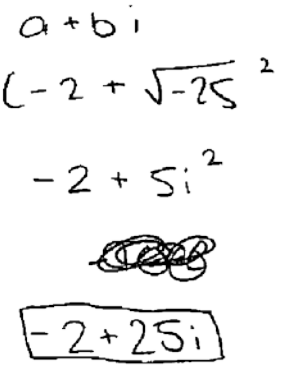
29 Express $\left(-2 + \sqrt{-25}\right)^2$ in simplest $a + bi$ form. Justify your answer.



Score 1: The student made a computational error.

Question 29

29 Express $\left(-2 + \sqrt{-25}\right)^2$ in simplest $a + bi$ form. Justify your answer.



Score 0: The student did not satisfy the criteria for one or more credits.

Question 29

29 Express $\left(-2 + \sqrt{-25}\right)^2$ in simplest $a + bi$ form. Justify your answer.

$(-2 + -\sqrt{-25})(-2+\sqrt{-25})$

$\sqrt{-1}\ \sqrt{25}$

$(-2 + i\sqrt{25})(-2+i\sqrt{25})$

$(-2 15i)(-25i)$

$425i^2$

Score 0: The student made multiple errors.

Question 30

30 The most common radioactive form of cesium is cesium-137. The half-life of cesium-137 is 30 years.

Suppose 2.7 micrograms of cesium-137 are found in a soil sample. Write a function for the amount of cesium-137 remaining, $c(t)$, in micrograms, in terms of the number of years, t, since the soil sample was taken.

$A = A_0\left(\frac{1}{2}\right)^{\frac{t}{h}}$

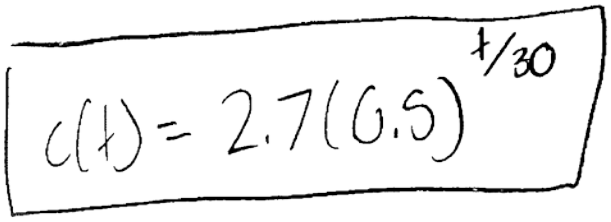
$C(t) = 2.7\left(\frac{1}{2}\right)^{\frac{t}{30}}$

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

Question 30

30 The most common radioactive form of cesium is cesium-137. The half-life of cesium-137 is 30 years.

Suppose 2.7 micrograms of cesium-137 are found in a soil sample. Write a function for the amount of cesium-137 remaining, $c(t)$, in micrograms, in terms of the number of years, t, since the soil sample was taken.



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

Question 30

30 The most common radioactive form of cesium is cesium-137. The half-life of cesium-137 is 30 years.

Suppose 2.7 micrograms of cesium-137 are found in a soil sample. Write a function for the amount of cesium-137 remaining, $c(t)$, in micrograms, in terms of the number of years, t, since the soil sample was taken.

$y = 2.7\left(\frac{1}{2}\right)^{\frac{x}{30}}$

Score 1: The student used incorrect notation.

Question 30

30 The most common radioactive form of cesium is cesium-137. The half-life of cesium-137 is 30 years.

Suppose 2.7 micrograms of cesium-137 are found in a soil sample. Write a function for the amount of cesium-137 remaining, $c(t)$, in micrograms, in terms of the number of years, t, since the soil sample was taken.

$2.7(0.5)^{\frac{t}{30}}$

2.7 = initial rate

0.5 = half life

30 yrs = one half life

t = years

Score 1: The student wrote an expression.

Question 30

30 The most common radioactive form of cesium is cesium-137. The half-life of cesium-137 is 30 years.

Suppose 2.7 micrograms of cesium-137 are found in a soil sample. Write a function for the amount of cesium-137 remaining, $c(t)$, in micrograms, in terms of the number of years, t, since the soil sample was taken.

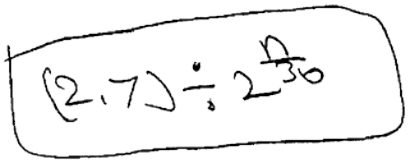
$$137 = 30\left(\frac{1}{2}\right)^{\frac{t}{30}}$$

Score 0: The student made multiple errors.

Question 30

30 The most common radioactive form of cesium is cesium-137. The half-life of cesium-137 is 30 years.

Suppose 2.7 micrograms of cesium-137 are found in a soil sample. Write a function for the amount of cesium-137 remaining, $c(t)$, in micrograms, in terms of the number of years, t, since the soil sample was taken.



Score 0: The student made multiple errors.

Question 31

31 Solve algebraically for x:

$$\sum_{a=0}^{4} (ax - 3) = 5$$

$(0x-3)+(1x-3)+(2x-3)+(3x-3)+(4x-3)=5$

$-3+x-3+2x-3+3x-3+4x-3=5$

$10x-15=5$

$\frac{10x}{10}=\frac{20}{10}$

$x=2$

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

Question 31

31 Solve algebraically for x:

$$\sum_{a=0}^{4}(ax-3)=5$$

$a=0$
$a=1$
$a=2$
$a=3$
$a=4$
} 5

$S_n = \frac{n(a_1 + a_n)}{2}$

$0(x)-3=$
$1(x)-3=$
$2(x)-3=$
$3(x)-3=$
$4(x)-3=$
} 5

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

$10 = \frac{5}{2}(-3+4x-3)$

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

$2 = (4x-6)$

$8 = 4x$

$x = 2$

$-3 + (x)-3 + 2x-3 + 3x-3 + 4x-3 = 5$

$-15 + 10x = 5$

$10x = 20$

$x = 2$

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

Question 31

31 Solve algebraically for x:

$$\sum_{a=0}^{4} (ax - 3) = 5$$

$(0x-3) = 5$

$(1x-3) = 5$

$(2x-3) = 5$

$(3x-3) = 5$

$(4x-3) = 5$

$+$

$(10x - 15) = 25$

$+15 \quad +15$

$\frac{10x = 40}{10} \quad x = 4$

Score 1: The student made a conceptual error.

Question 31

31 Solve algebraically for x:

$$\sum_{a=0}^{4} (ax - 3) = 5$$

$x = 2$

$(0x - 3) = -3$

$(1x - 3) = -2$

$(2x - 3) = 1$ $\quad x = 2$

$(3x - 3) = 3$

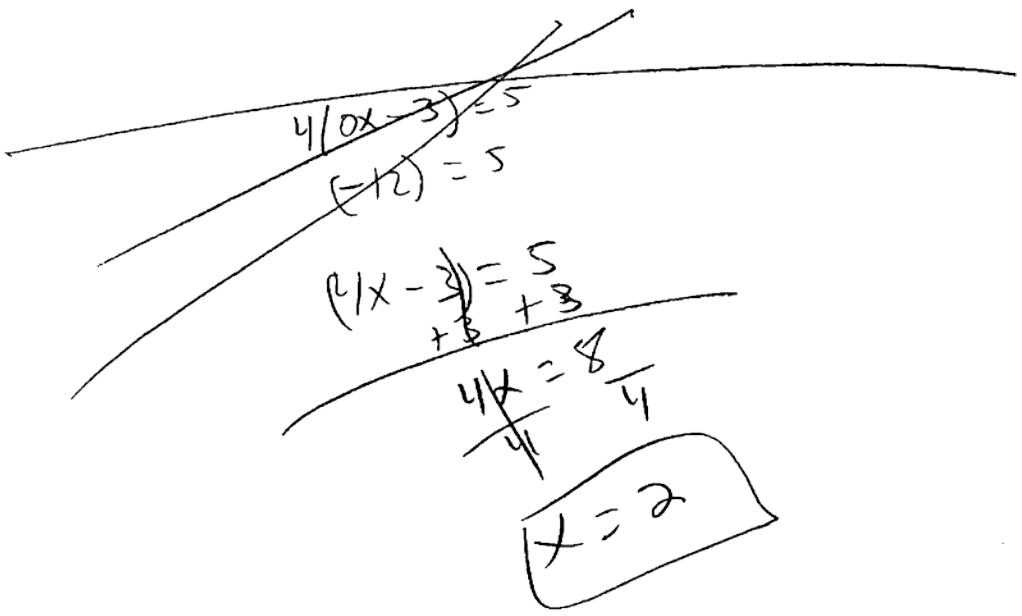
$(4x - 3) = 5$

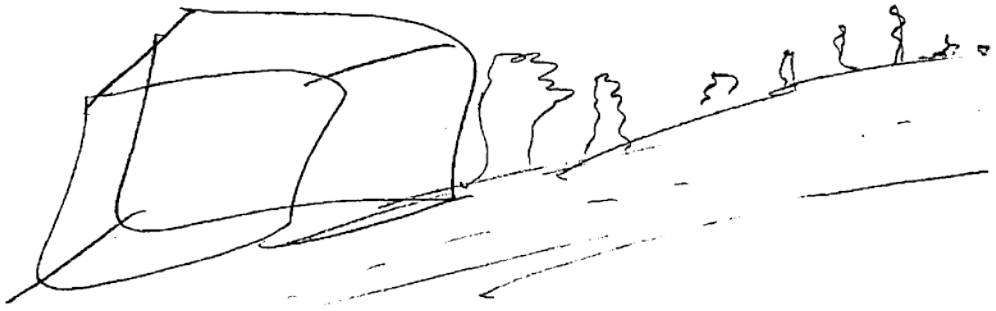
Score 1: The student used a method other than algebraic.

Question 31

31 Solve algebraically for x:

$$\sum_{a=0}^{4} (ax - 3) = 5$$



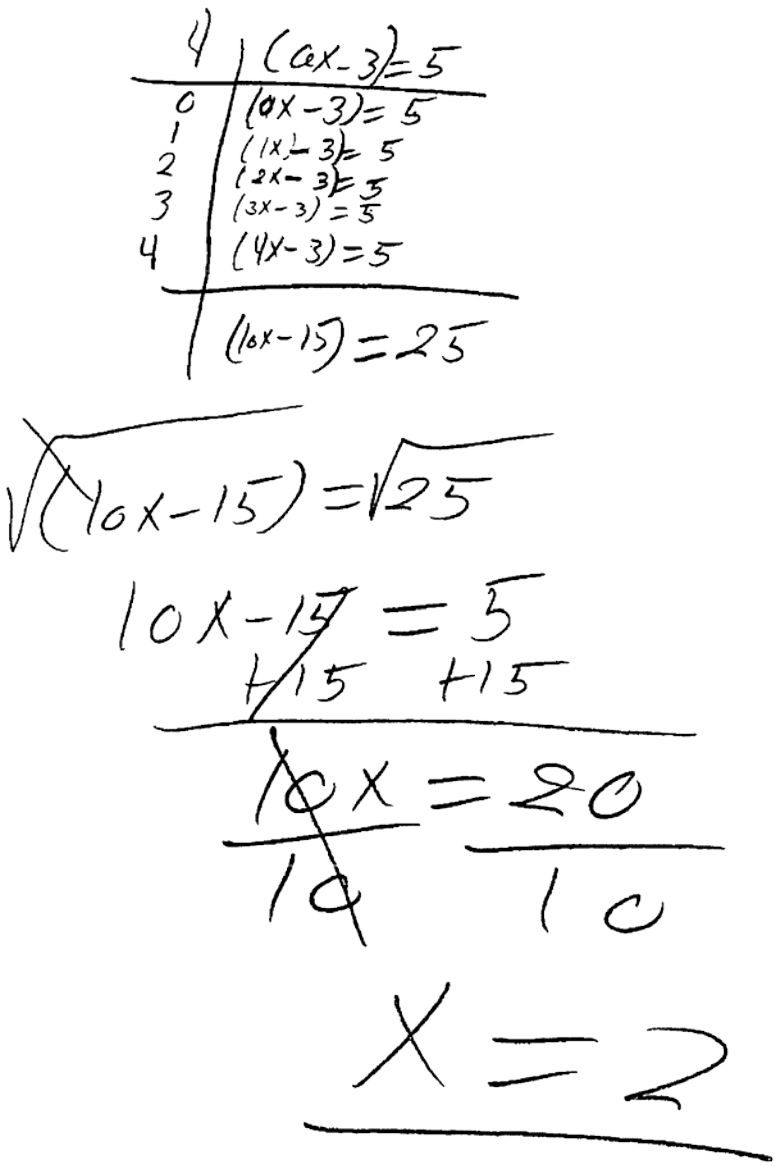


Score 0: The student obtained a correct response by an obviously incorrect procedure.

Question 31

31 Solve algebraically for x:

$$\sum_{a=0}^{4} (ax - 3) = 5$$



Score 0: The student made multiple errors and obtained a correct response by an obviously incorrect procedure.

Question 32

32 Given the exponential function $y = 5.381e^{0.214x}$, rewrite the function in the form of $y = a(b)^x$, rounding values to the *nearest thousandth*.

$y = 5.381(1.239)^x$

$e^{0.214} = 1.239$

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

Question 32

32 Given the exponential function $y = 5.381e^{0.214x}$, rewrite the function in the form of $y = a(b)^x$, rounding values to the *nearest thousandth*.

$y = 5.381(1.239)^x$

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

Question 32

32 Given the exponential function $y = 5.381e^{0.214x}$, rewrite the function in the form of $y = a(b)^x$, rounding values to the *nearest thousandth*.

$y = 5.381(e)^{0.214x}$

$y = 14.627^{0.214x}$

$y = 1.778^x$

$y = 5.381 \cdot 1.239^x$

Score 1: The student did not clearly indicate their final answer.

Question 32

32 Given the exponential function $y = 5.381e^{0.214x}$, rewrite the function in the form of $y = a(b)^x$, rounding values to the *nearest thousandth*.

$5.381e^{0.214x}$

$5.381(b)^x = 5.381e^{0.214x}$

$5.381e^{0.214(1)} = 6.665028$

$\frac{6.665028}{5.381} = 1.2386$

$5.381(1.239)^x = 5.381e^{0.214x}$

$a^{bc} = (a^b)^c$

$5.381e^{0.214x} = (5.381e^{0.214})^x$

Score 1: The student wrote an expression.

Question 32

32 Given the exponential function $y = 5.381e^{0.214x}$, rewrite the function in the form of $y = a(b)^x$, rounding values to the *nearest thousandth*.

$f(x) = 5.381(1.2386)^x$

$f(x) = 6.665^x$

Score 0: The student made a conceptual and notational error.

Question 32

32 Given the exponential function $y = 5.381e^{0.214x}$, rewrite the function in the form of $y = a(b)^x$, rounding values to the *nearest thousandth*.

14.627 .214x

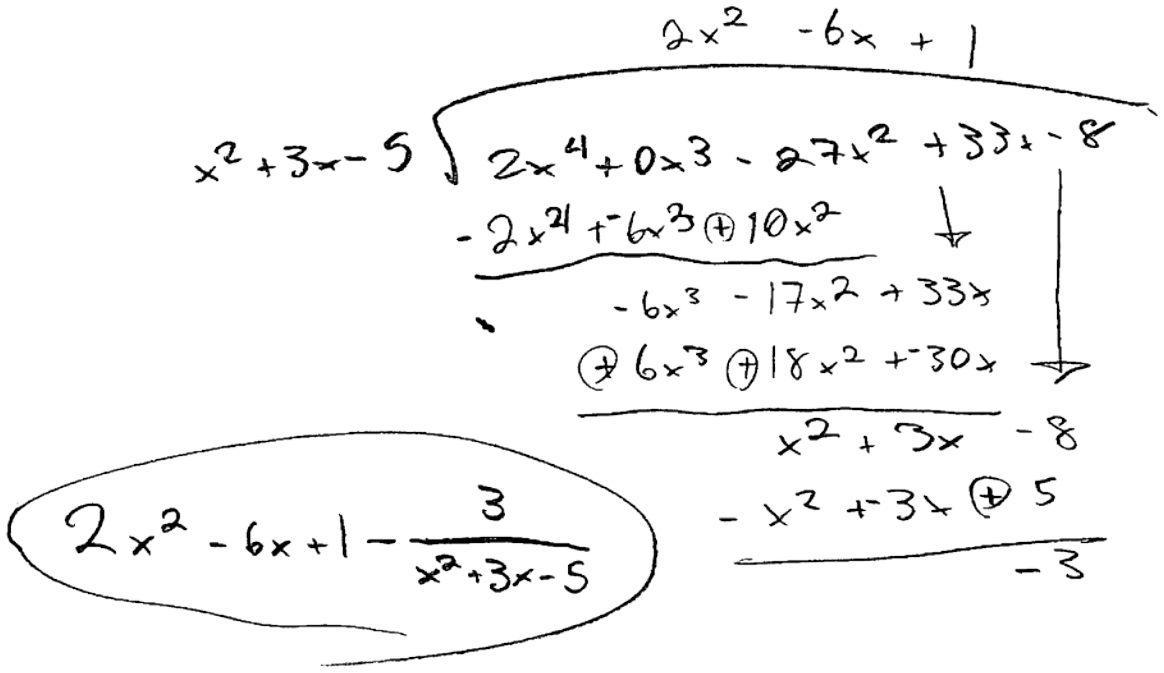
Score 0: The student made multiple errors.

Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.



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

Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.

$$x^2+3x-5 \overline{)\,2x^4-27x^2+33x-8}$$

$2x^2-6x+1$

$= 2x^4-6x^3+10x^2$

$-6x^3-17x^2+33x-8$

$+6x^3+18x^2-30x$

x^2+3x-8

$-x^2-3x+5$

-3

$$\frac{2x^4-27x^2+33x-8}{x^2+3x-5} = 2x^2-6x+1+\left(\frac{-3}{x^2+3x-5}\right)$$

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

Question 33

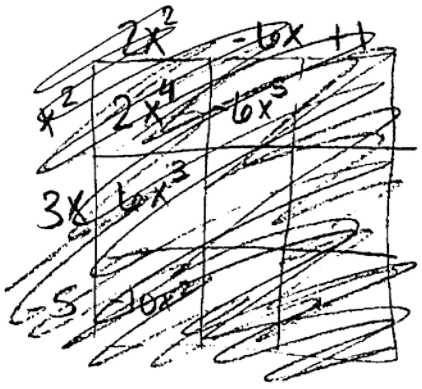
33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.

$$\begin{array}{r} 2x^2 - 6x + 1 \\ x^2+3x-5 \overline{)\,2x^4 + 0x^3 - 27x^2 + 33x - 8} \\ +\,\cancel{-2x^4 \mp 6x^3 + 10x^2} \\ \hline -6x^3 - 17x^2 + 33x \\ +\,\cancel{+6x^3 + 18x^2 + 30x} \\ \hline x^2 + 63x - 8 \\ +\,\cancel{-x^2 \mp 3x + 5} \\ \hline 60x - 3 \end{array}$$

$$2x^2 - 6x + 1 + \frac{60x - 3}{x^2 + 3x - 5}$$



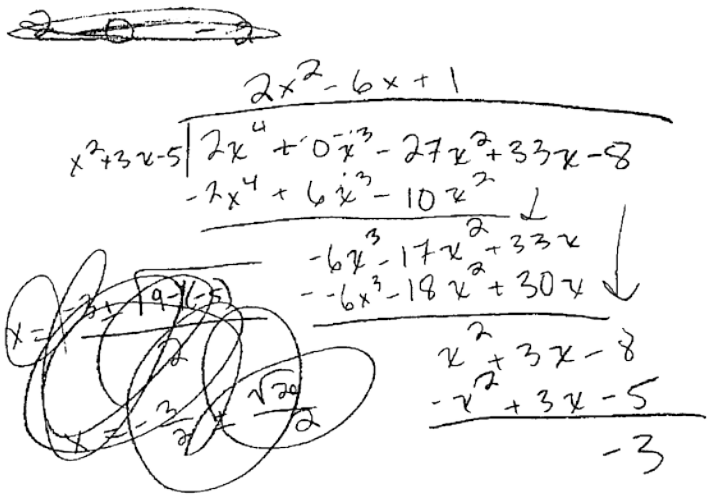
Score 3: The student made one computational error.

Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.



Score 3: The student did not express the result in $q(x) + \frac{r(x)}{d(x)}$ form.

Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.

$$2x^2 - 6x + 1 + \frac{-6x - 3}{2x^4 - 27x^2 + 33x - 8}$$

$$x^2 + 3x - 5 \overline{)\, 2x^4 - 27x^2 + 33x - 8}$$

$$-(2x^4 + 6x^3 - 10x^2)$$

$$-6x^3 - 17x^2 + 33x - 8$$

$$-(-6x^3 - 18x^2 + 30x)$$

$$x^2 - 3x - 8$$

$$-(x^2 + 3x - 5)$$

$$-6x - 3$$

$$2x^2 - 6x + 1 + \frac{-6x - 3}{2x^4 - 27x^2 + 33x - 8}$$

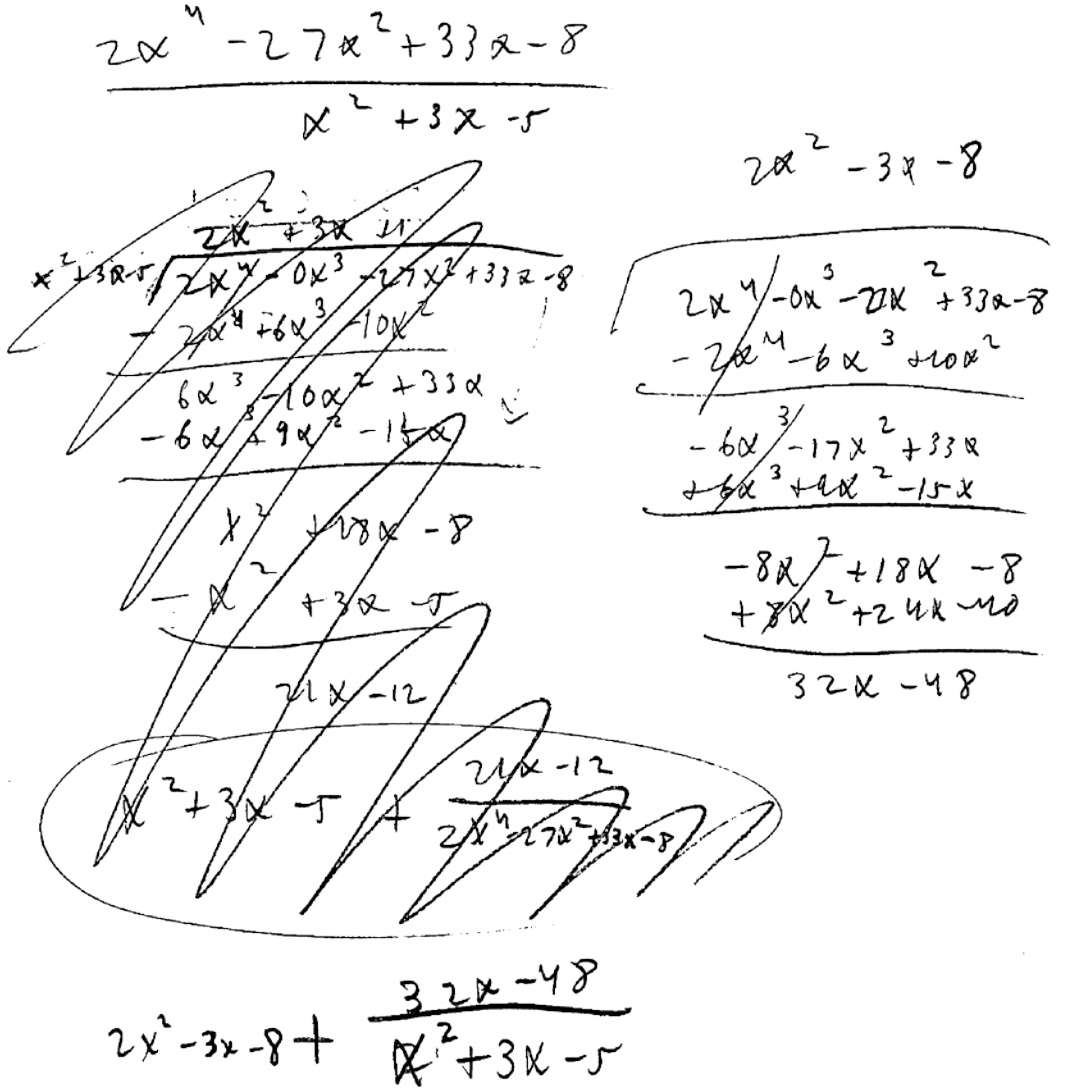
Score 2: The student made a computational error and wrote an incorrect $d(x)$.

Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.



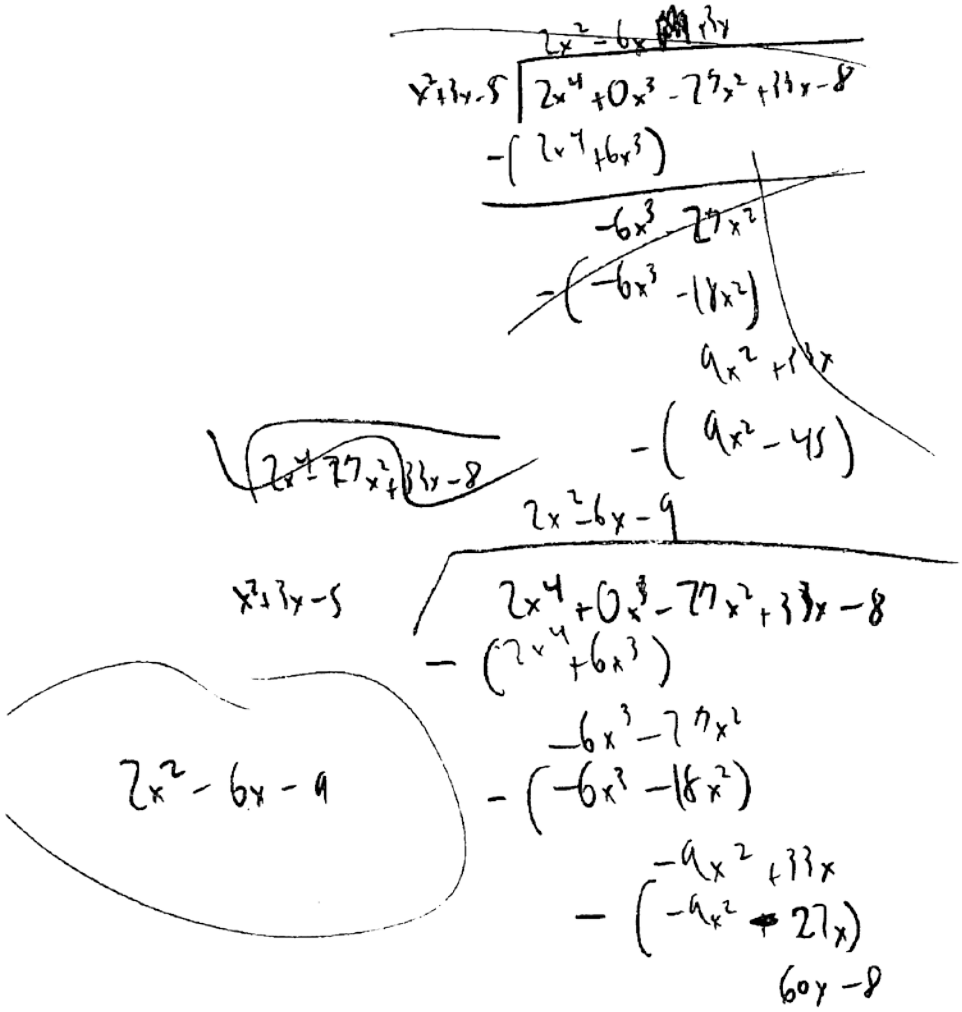
Score 2: The student made two unique computational errors.

Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.



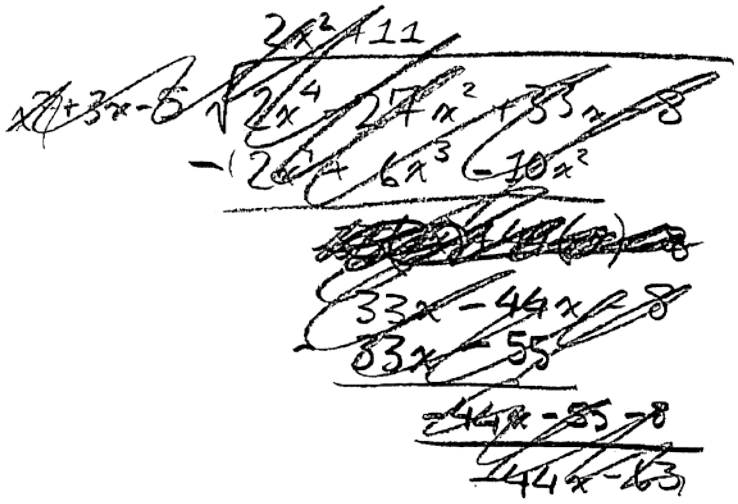
Score 1: The student made the same conceptual error distributing, and did not express their result in $q(x) + \frac{r(x)}{d(x)}$ form.

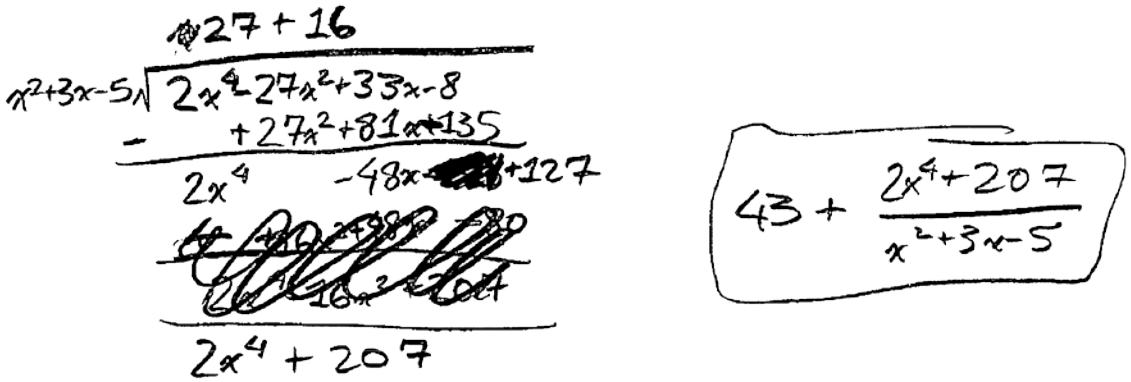
Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.





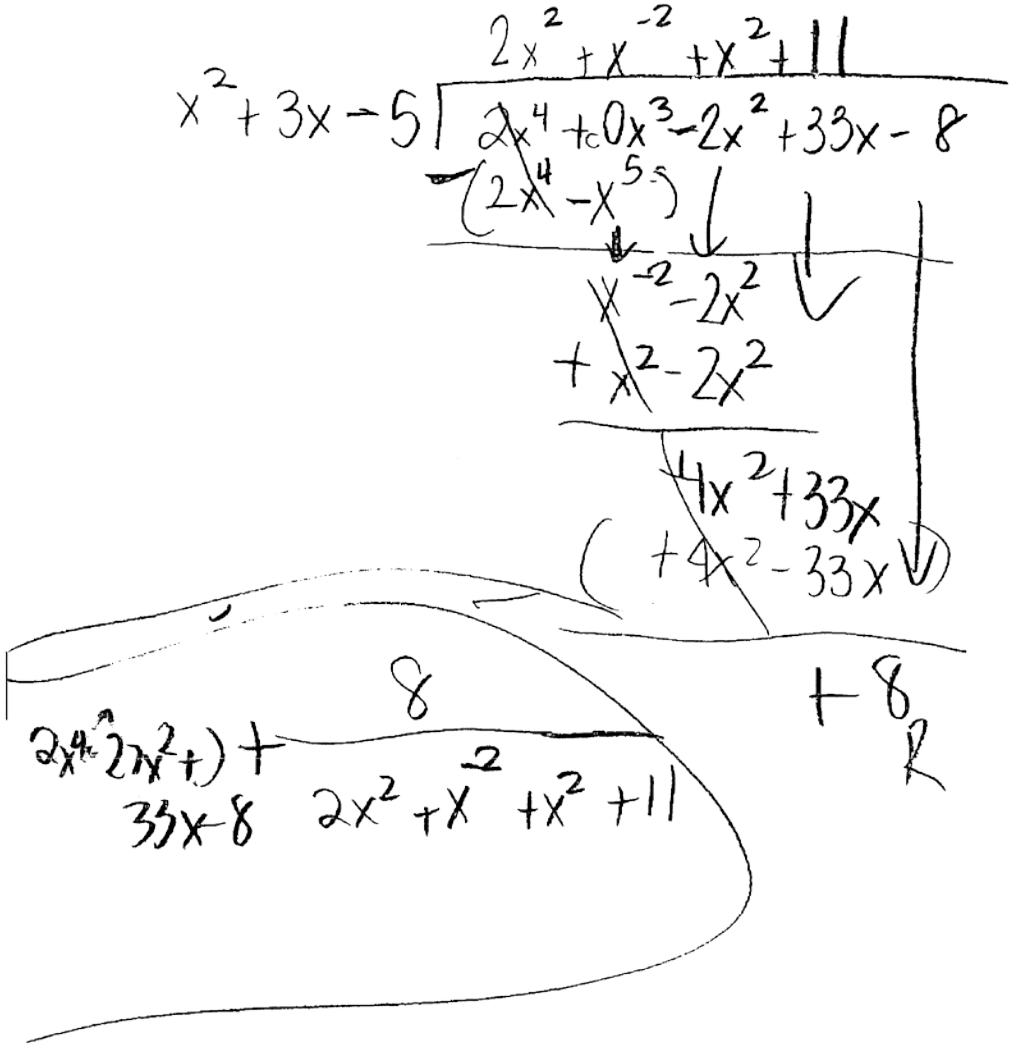
Score 0: The student's response did not contain enough relevant course-level work to receive any credit.

Question 33

33 Determine the quotient and remainder of the expression below.

$$\frac{2x^4 - 27x^2 + 33x - 8}{x^2 + 3x - 5}$$

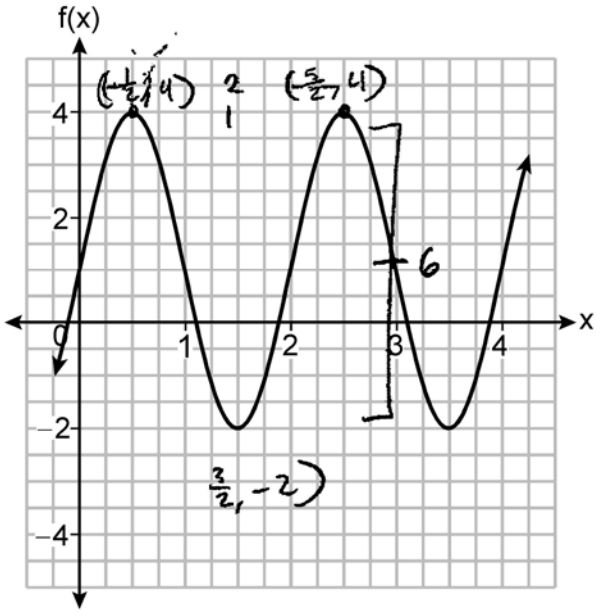
Express the result in the form $q(x) + \frac{r(x)}{d(x)}$.



Score 0: The student did not satisfy the criteria for one or more credits.

Question 34

34 The sinusoidal function f is graphed below.



State the period of the function f.

$\frac{5}{2} - \frac{1}{2} = 2$

Period of function f is 2

State the amplitude of the function f.

Amplitude of function f is 3

Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.

$f(x) = 3\sin(\pi x) + 1$

$\frac{2\pi}{B} = \frac{2}{1}$

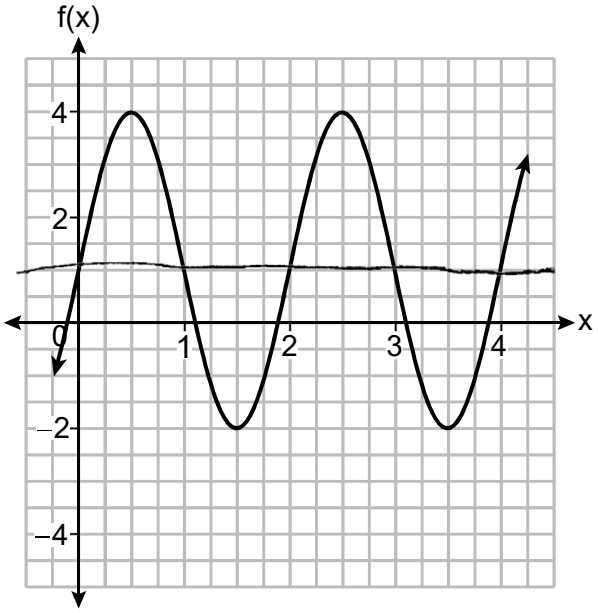
$\frac{2\pi}{2} = \frac{2B}{2}$

$B = \pi$

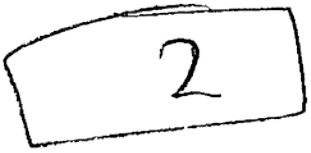
Score 4: The student gave a complete and correct response.

Question 34

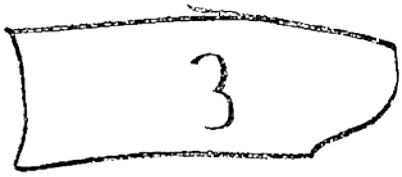
34 The sinusoidal function f is graphed below.



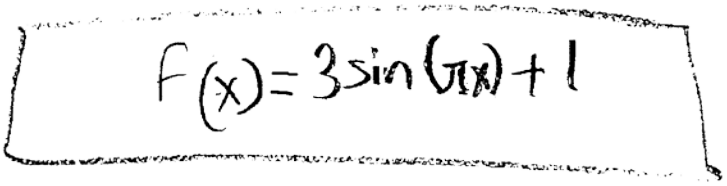
State the period of the function f.



State the amplitude of the function f.



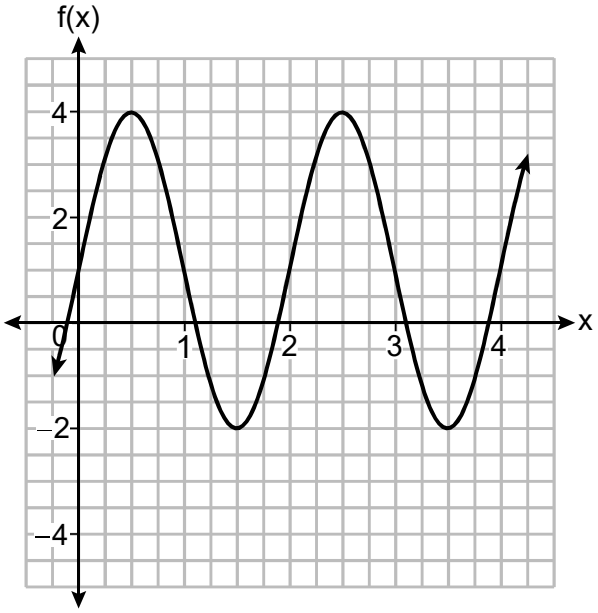
Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.



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

Question 34

34 The sinusoidal function f is graphed below.



State the period of the function f.

P = 2.5

State the amplitude of the function f.

A = 3

$A = \frac{max - min}{2}$

$A = \frac{4 - -2}{2} = 3$

Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.

$f(x) = 3\sin(0.8\pi x) + 1$

$A = 3$

$D = \frac{max + min}{2} = \frac{4 + -2}{2} = 1$

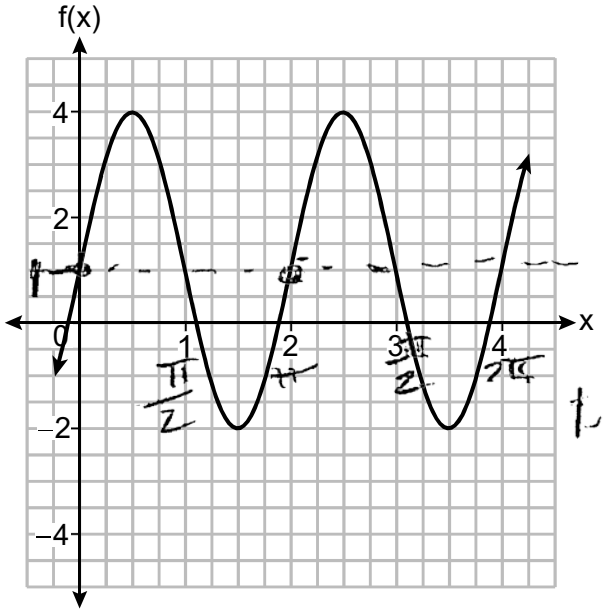
$D = 1$

$B = \frac{2\pi}{2.5} = 0.8\pi$

Score 3: The student made an error calculating the period.

Question 34

34 The sinusoidal function f is graphed below.



up 6 down 6

1 is the midline

State the period of the function f.

2 is the period

State the amplitude of the function f.

3...something idk the specific units

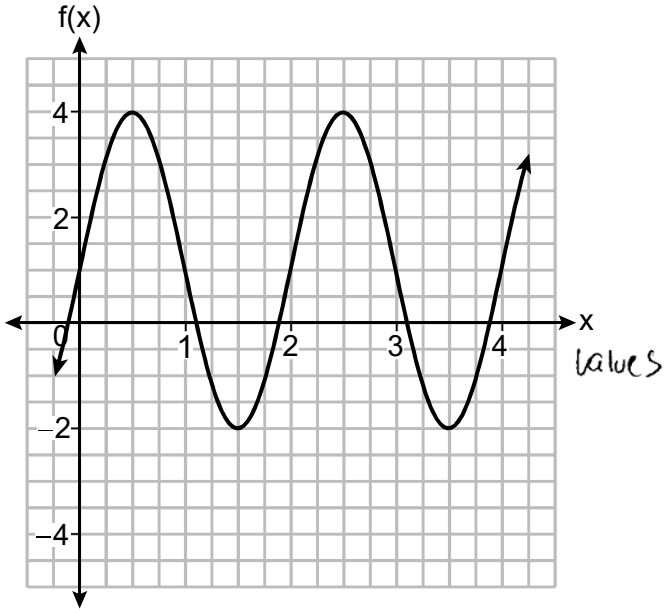
Write the equation in the form $f(x) = A\sin(Bx) + D$ to represent the sinusoidal function.

$f(x)=3\sin(x)+1$

Score 3: The student wrote an incorrect B value.

Question 34

34 The sinusoidal function f is graphed below.



State the period of the function f.

Period $= \frac{2\pi}{B}$

Period $= 2$

$\frac{2}{1} = \frac{2\pi}{B}$

$\frac{2x}{2} = \frac{2\pi}{2}$

$x = \pi$

B

State the amplitude of the function f.

4

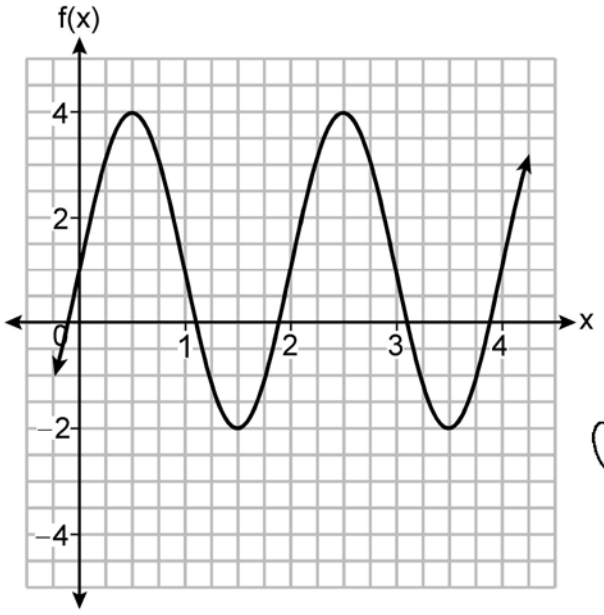
Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.

$f(x) = 4 \sin \pi x + 2$

Score 2: The student stated an incorrect amplitude and midline.

Question 34

34 The sinusoidal function f is graphed below.



2π

6π ÷ 3 / 3 ÷ 3

6 ÷ 360 (π(1) / 180)

6 ÷

State the period of the function f.

2π

State the amplitude of the function f.

The amplitude = 3

a
b
P
d

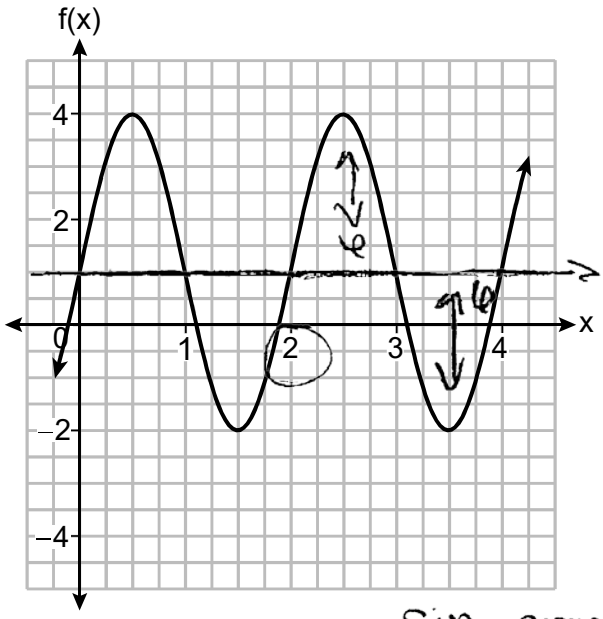
Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.

$f(x) = 3\sin(2x) + 1$

Score 2: The student incorrectly determined the period and B.

Question 34

34 The sinusoidal function f is graphed below.



midline 1

amplitude

|A| = 6

B · P = 2π

P = 2

B · P = 2π

$\frac{2}{2} \cdot P = \frac{2\pi}{2}$

π

$\frac{\pi}{4}$ — count on x-axis

sin grap

State the period of the function f.

P = 2

State the amplitude of the function f.

Amplitude is 6

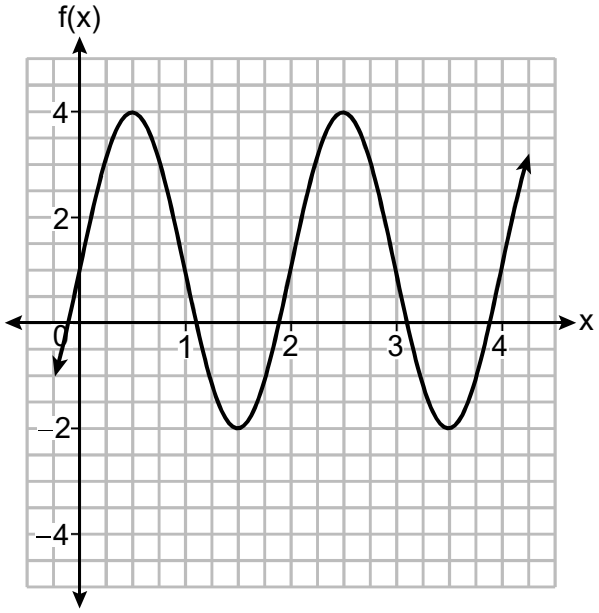
Write the equation in the form $f(x) = A\sin(Bx) + D$ to represent the sinusoidal function.

y = 6sin(1x)+2

Score 1: The student correctly determined the period.

Question 34

34 The sinusoidal function f is graphed below.



State the period of the function f.

Per: $\frac{2\pi}{b} = \frac{2\pi}{3} = \frac{2\pi}{3}$ $a = 6$ $6 \div 2$ 3

State the amplitude of the function f.

$a = 6$

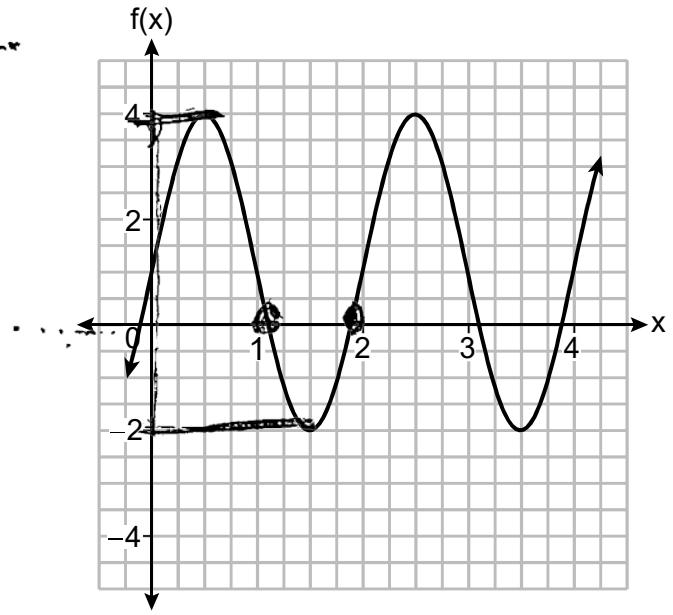
Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.

$f(x) = 6 \sin\left(\frac{2\pi}{3}(x)\right) + 1$

Score 1: The student earned one credit for the equation.

Question 34

34 The sinusoidal function f is graphed below.



State the period of the function f.

2π

State the amplitude of the function f.

4

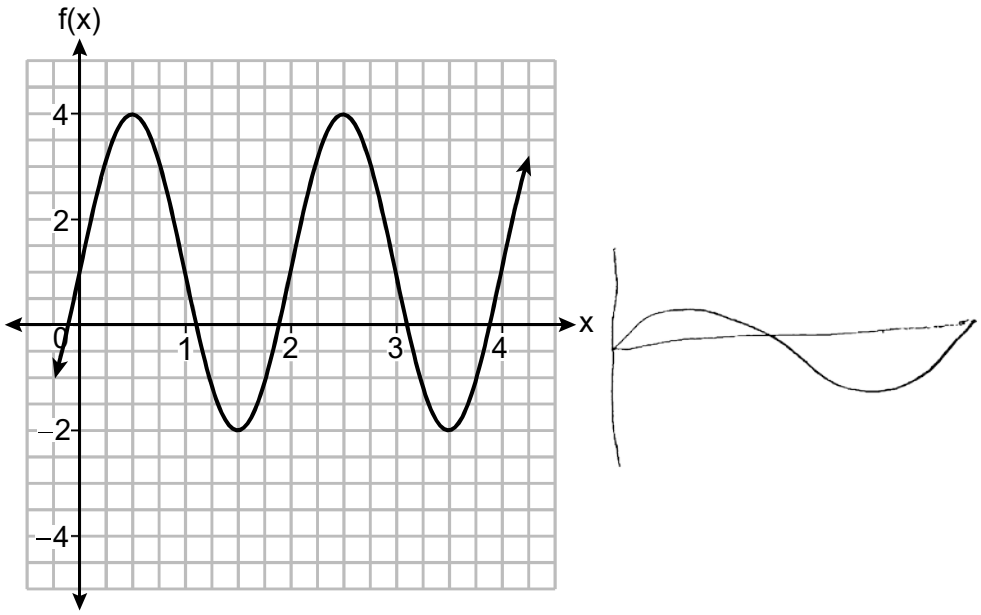
Write the equation in the form $f(x) = A\sin(Bx) + D$ to represent the sinusoidal function.

$4\sin\left(\frac{\pi}{2}x\right) + 6$

Score 0: The student did not satisfy the criteria for one or more credits.

Question 34

34 The sinusoidal function f is graphed below.



State the period of the function f.

The period of the function is 4.

State the amplitude of the function f.

Amp = 6

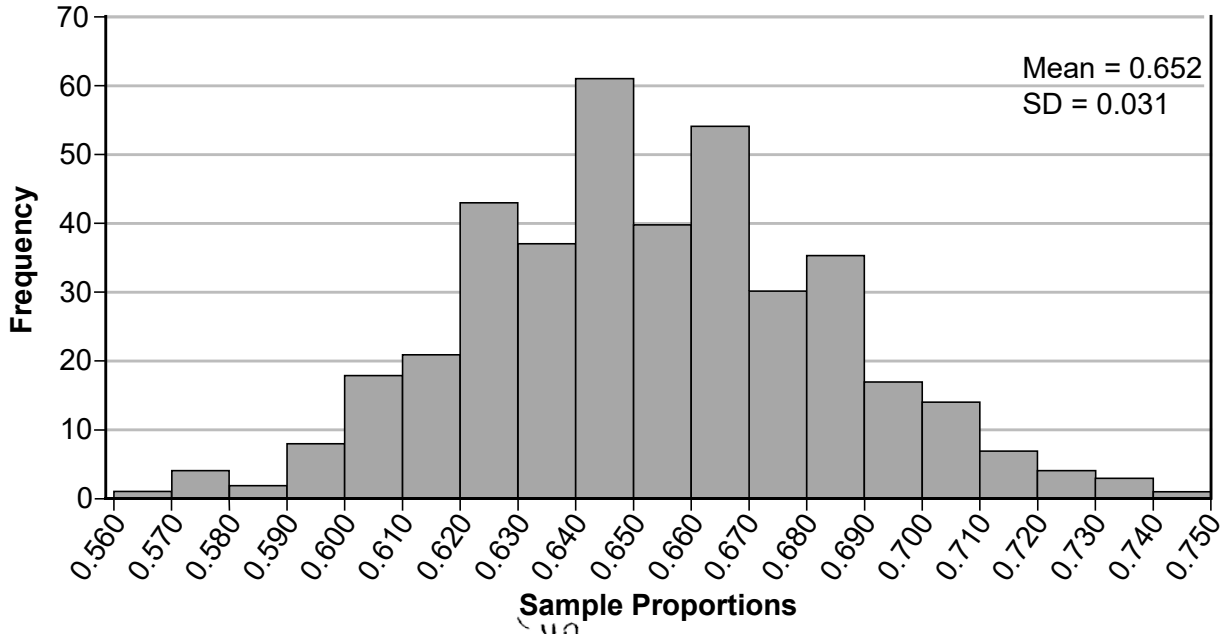
Write the equation in the form $f(x) = A \sin(Bx) + D$ to represent the sinusoidal function.

$f(x) = 6\cos(\pi x) - 2$

Score 0: The student did not satisfy the criteria for one or more credits.

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

0.031 · 2 = 0.062
0.652 − 0.062 = 0.59
0.652 + 0.062 = 0.714
0.59 − 0.71

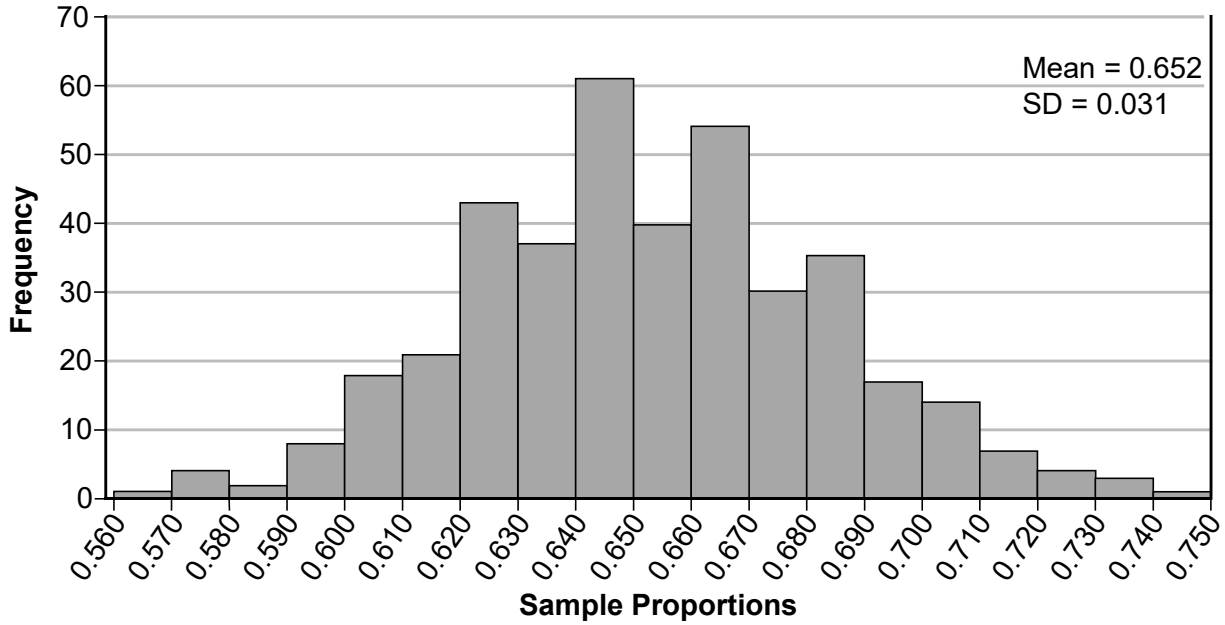
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

No because the lowest the sample proportions go is 0.560 which is still more than half so anything less than 0.5 would be miniscule.

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

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

$0.652 \pm 2(0.031)$

$(.59, .714)$ $(.59, .71)$

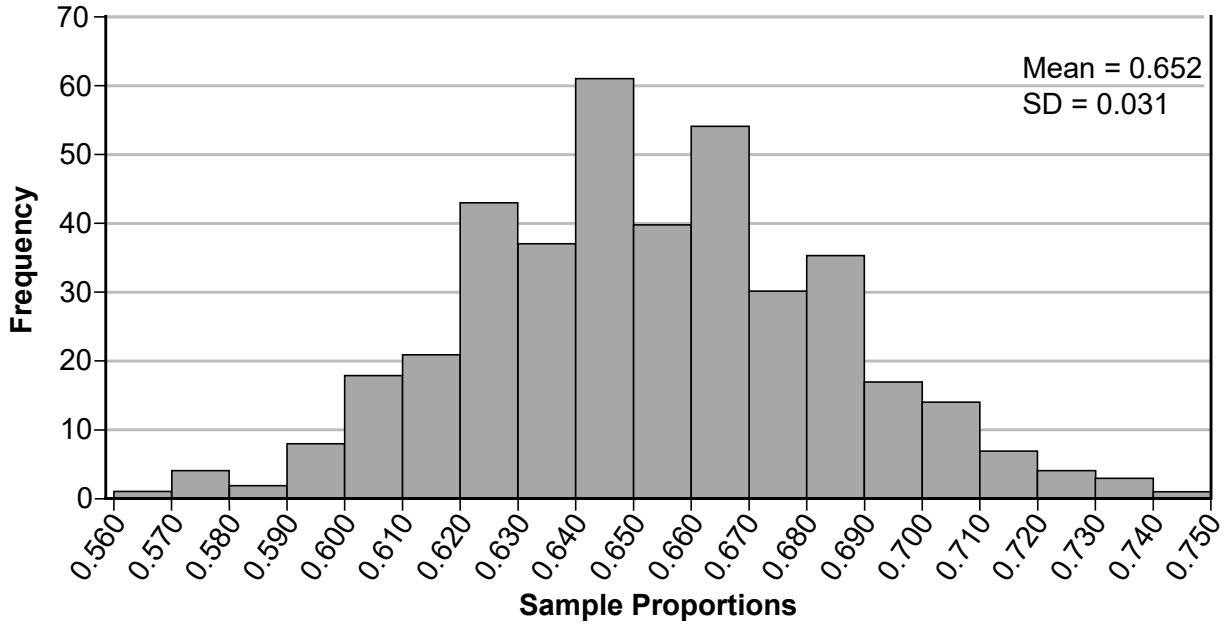
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

no because 50% falls below the 59%–71% interval.

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

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

.59 to .71

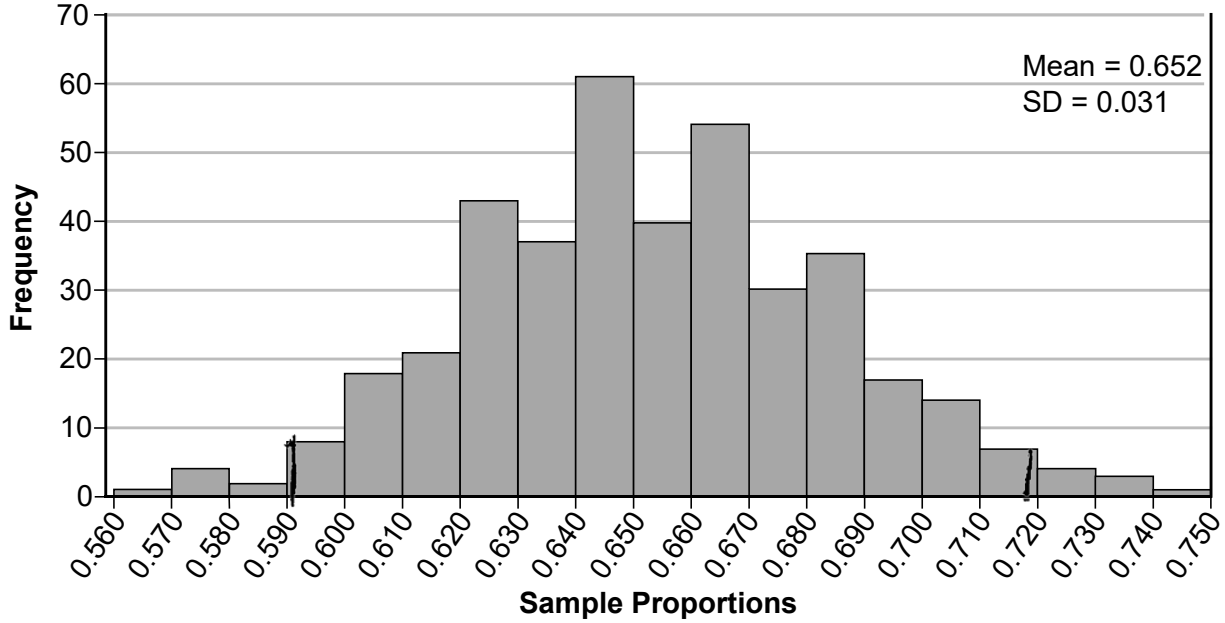
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

No.
The plausible outcomes are all more than 50%, so it would be statistically significant for less than ½ to restrict.

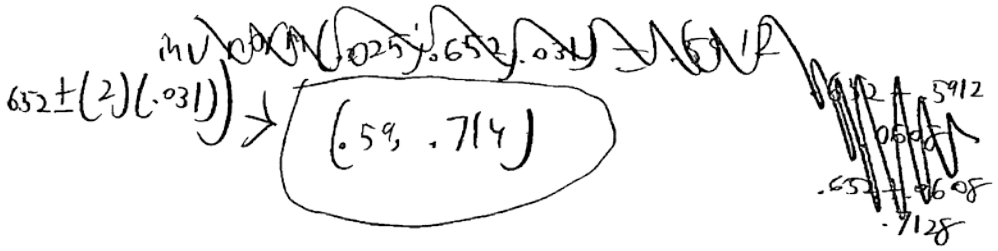
Score 3: The student did not show work to determine the interval.

Question 35

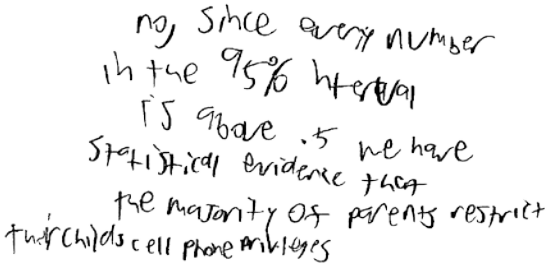
35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.



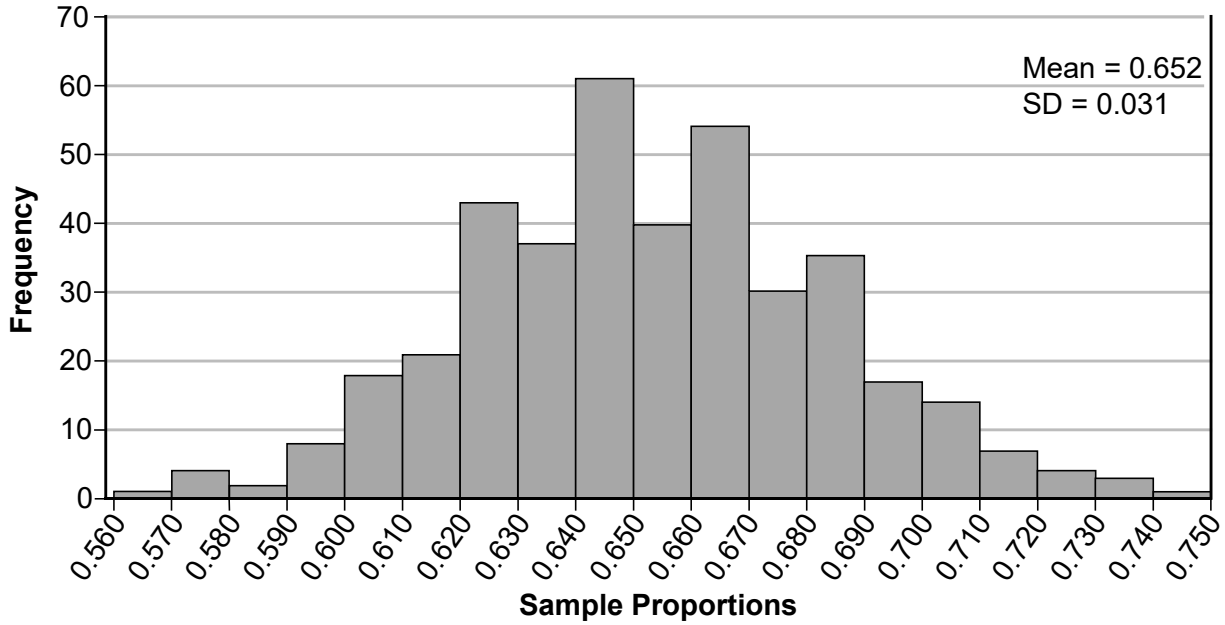
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.



Score 3: The student did not round to the nearest hundredth.

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

(.59, .71)

$0.652 \pm 2(0.031)$

$0.652 \pm .062$

$0.652 + .062$ $0.652 - .062$

$.714$ $.59$

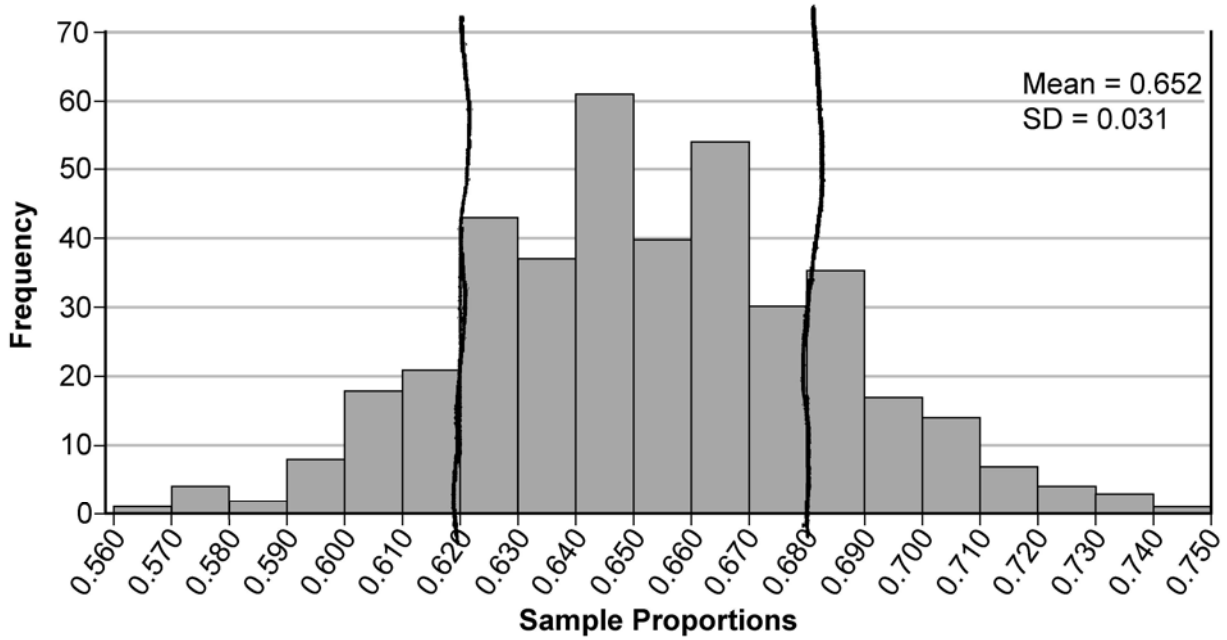
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

Yes because the interval of 95% is less than half.

Score 2: The student's explanation is incorrect.

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

$1.95 = 250(t - 250)$ (0.62, 0.68)

$0.652 + 0.031 = 0.683$

$0.652 - 0.031 = 0.621$

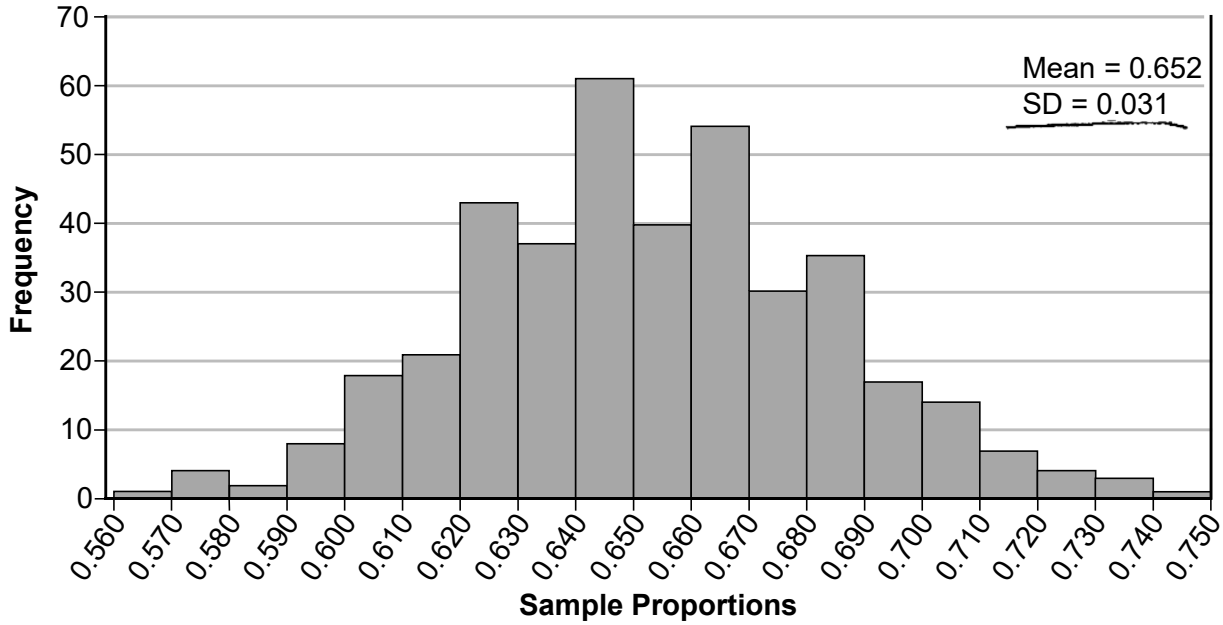
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

The simulation results does not support the superintedent concern because I compared 50% to the interval.

Score 2: The student calculated an incorrect interval and their explanation was incomplete.

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

$\bar{x} \pm 2\sigma_{\bar{x}}$

$0.652 + 2(0.031) = 0.714 = 71.4\%$

$0.652 - 2(0.031) = 0.59 = 59\%$

0.59 – 0.714

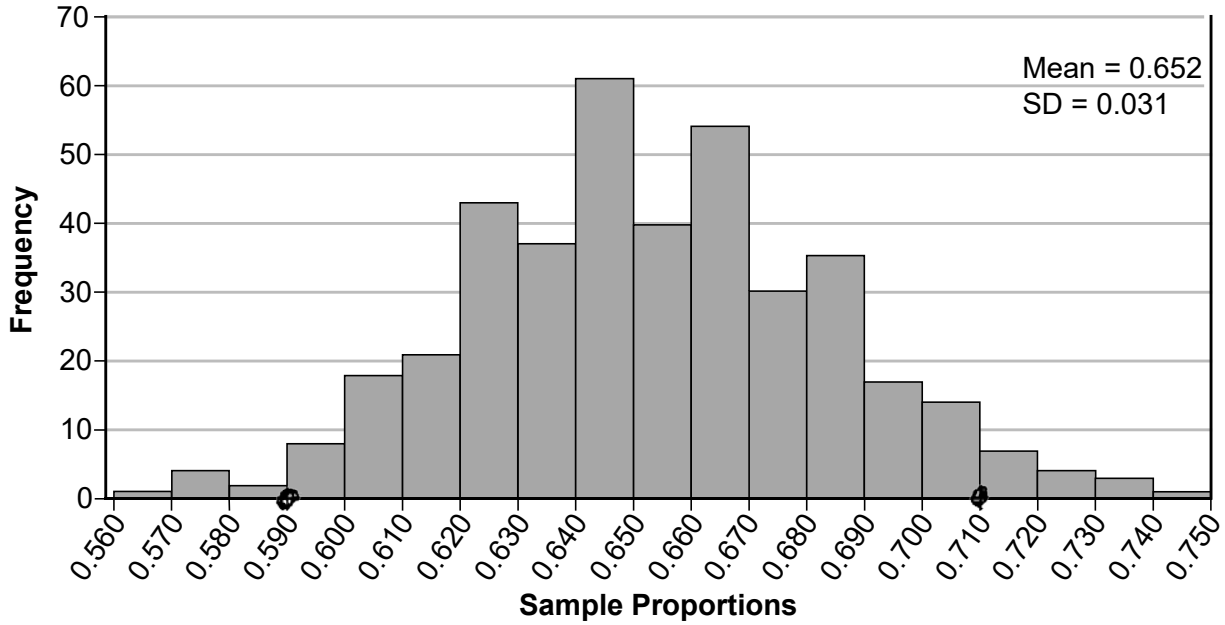
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

The simulation results do not support the superintendents concerns because it is within the middle 95%.

Score 1: The student earned one credit for the interval.

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

Mean ± 2(SD)
.65 ± 2(.031)
.588 to .712 ≈ .59 to .71

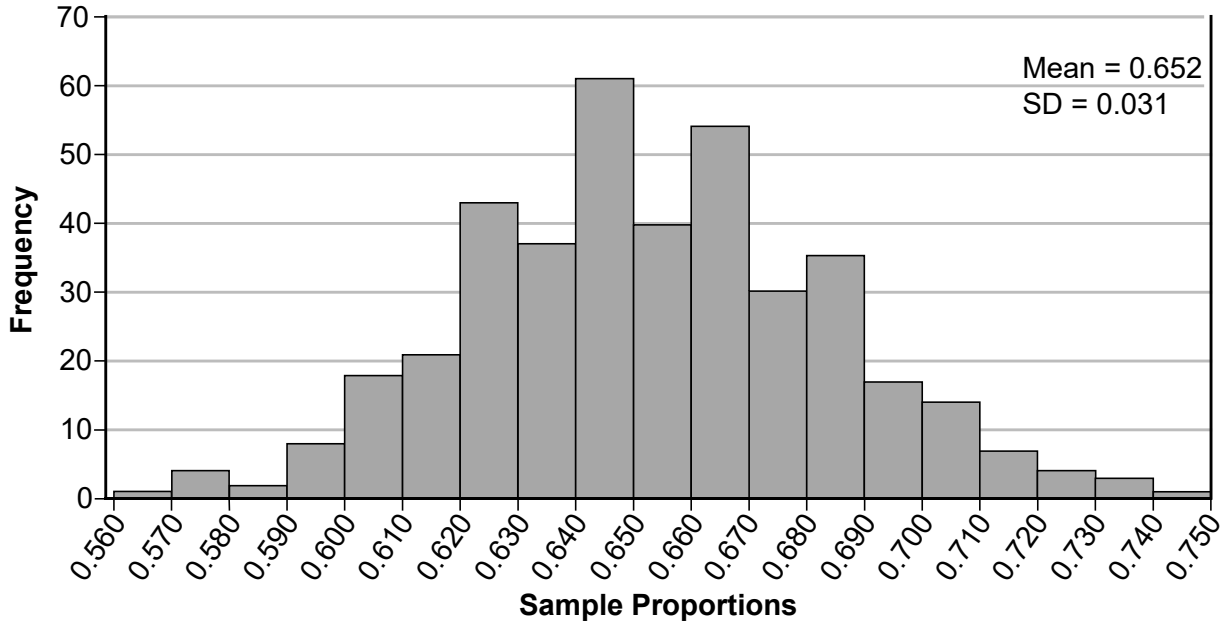
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

65% falls within the middle 95%.

Score 1: The student used an incorrect mean when calculating the interval, did not state yes or no, and the explanation is irrelevant.

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

0

Lower: 250
Upper: 400
$\mu = 0.652$
$\sigma = 0.031$

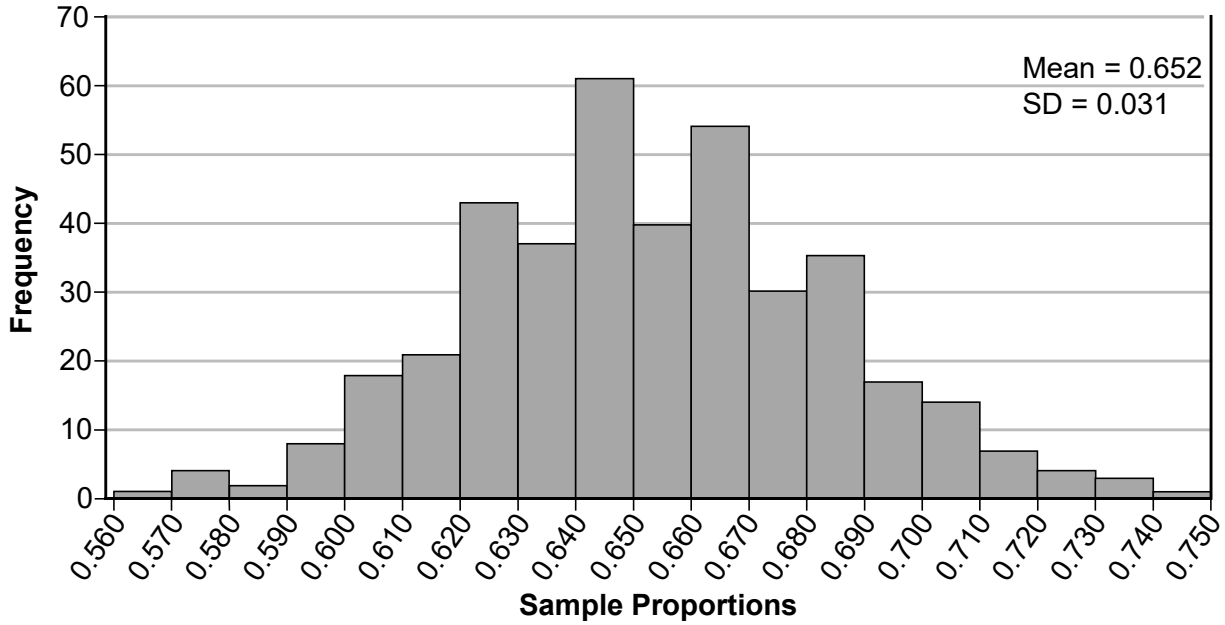
The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

The Simulation Results Does not support the Superintendents Concern because, more than half do not Restrict their children.

Score 0: The student did not satisfy the criteria for one or more credits.

Question 35

35 A principal wonders what percentage of parents at her large high school restrict their child's cell phone privileges. The school surveys a random sample of 250 parents at the school and finds that 65% of them restrict their child's cell phone privileges. The school runs a simulation with 400 samples of 250 parents, assuming that 65% of them restrict cell phone privileges. The simulation results are shown below.



Use the simulation to determine an interval containing the middle 95% of simulated proportions. Justify your answer. Round all values to the *nearest hundredth*.

.652 + 2(0.031) = .714

.714

The school district's superintendent worries that less than half of parents restrict their child's cell phone privileges. Do the simulation results support the superintendent's concern? Explain.

Because 65% of them restrict Cell Phone Privileges that's more than half.

Score 0: The student did not satisfy the criteria for one or more credits.

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$T(0) = 110e^{0} + 74$
$T(0) = 110 + 74$
$T(0) = 184$

184°F

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$T(5) = 110e^{-0.0453(5)} + 74$
$T(5) = 161.705$

$m = \frac{184 - 161.705}{0 - 5}$
$m = -4.5$

Question 36 is continued on the next page.

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

Question 36 continued

Interpret the value of the average rate of change within the given context.

From the time the tea was poured to 5 minutes after, the tea cooled about 4.5°F every minute.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$120 = 110e^{-0.0453(t)} + 74$

$46 = 110e^{-0.0453(t)}$

$\frac{23}{55} = e^{-0.0453t}$

$-0.0453(t) = \ln\left(\frac{23}{55}\right)$

$t = \frac{\ln\left(\frac{23}{55}\right)}{-0.0453}$

$t = 19.2$

19.2 minutes

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$110e^{-0.0453 \cdot 0} + 74$
$= 110 + 74 = 184°F$

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$$\frac{T(5) - T(0)}{5} = -4.5$$

Question 36 is continued on the next page.

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

Question 36 continued

Interpret the value of the average rate of change within the given context.

The temp decreases a rate of 4.5°F per minute on average.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$110e^{-0.0453x} + 74 = 120$

$110e^{-0.0453x} = 46$

$e^{-0.0453x} = 0.41818$

$-0.0453x = -0.8718$

$x = 19.24589$

$x = 19.2$

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

~~74°F~~ 184°F

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$\frac{161.705 - 184}{5 - 0}$ $\frac{-22.295}{5}$

-4.5

Question 36 is continued on the next page.

Score 5: The student's interpretation is incorrect.

Question 36 continued

Interpret the value of the average rate of change within the given context.

$4.5^{\circ}F$ less every minute the cup is cooled

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$120 = 110e^{-.0453x} + 74$

$\ln \frac{46}{110} = -.0453x$

$\frac{\ln \frac{46}{110}}{-.0453}$

19.2 minutes

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$T(0) = 110e^{-0.0453(0)} + 74$

184°F

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$\frac{161.7051... - 184^\circ}{5 - 0} = -4.5^\circ$

$T(0) = 184^\circ F$

$T(5) = 110e^{-0.0453(5)} + 74$

$T(5) = 161.7051...^\circ F$

Question 36 is continued on the next page.

Score 5: The student had a transcription error with the exponent in the last part.

Question 36 continued

Interpret the value of the average rate of change within the given context.

On average the tea cooled by 4.5 °F each minute in the first five minutes.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$120^0 = 110e^{-0.0453x} + 74$
$-74 \qquad -74$

19.4 minutes = x

$\frac{46}{110} = \frac{110e^{-0.0453x}}{110}$

$\frac{23}{55} = e^{-0.045x}$

$\ln\frac{23}{55} = \ln e^{-0.045x}$

$\ln\frac{23}{55} = -0.045x(1)$

$\frac{\ln\frac{23}{55}}{-0.045} = \frac{-0.045x}{-0.045}$

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$T(0) = 110e^{-0.0453(0)} + 74$

$T(0) = 110e^{(0)} + 74$

$T(0) = 110(1) + 74$

$\boxed{T(0) = 184°}$

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$T(5) \approx 161.7$

$$\frac{184 - 161.7}{-5} = 4.5$$

Question 36 is continued on the next page.

Score 4: The student made a computational error calculating the average rate of change and gave an incomplete interpretation.

Question 36 continued

Interpret the value of the average rate of change within the given context.

The tea cooled by about 4.5°

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$120 = 110e^{-0.0453x} + 74$

$-74 \qquad -74$

$\frac{46}{110} = \frac{110e^{-0.0453x}}{110}$

$\ln\left(\frac{46}{110}\right) = \ln e^{-0.0453x}$

$\frac{\ln\left(\frac{46}{110}\right)}{-0.0453} = \frac{-0.0453x}{-0.0453}$

$19.2 \approx x$

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

184°

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

(0, 184)
(5, 161.71)

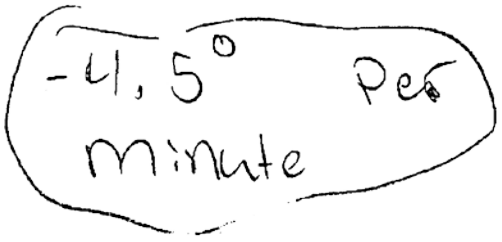
$\frac{184 - 161.71}{0 - 5} = -4.5^{\circ}$

Question 36 is continued on the next page.

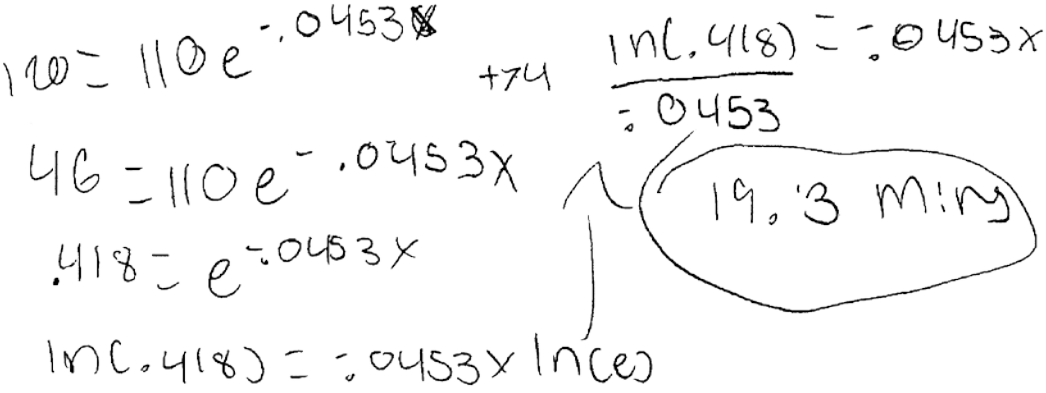
Score 4: The student gave an incomplete interpretation and rounded too early in the last part.

Question 36 continued

Interpret the value of the average rate of change within the given context.



To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.



Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$T(0) = 110e^{-0.0453(0)} + 74$

$T(0) = \boxed{184°F}$

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$\frac{162 - 184}{5 - 0}$ $\frac{-22}{5}$

-4.4

$T(5) = 110e^{-0.0453(5)} + 74 = 161.7$

$T(0) = 110e^{-0.0453(0)} + 74 = 184$

Question 36 is continued on the next page.

Score 3: The student rounded too early calculating the average rate of change, gave no interpretation, and did not express their final answer to the nearest tenth.

Question 36 continued

Interpret the value of the average rate of change within the given context.

Average rate of change = -4.4

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$T(x) = 110e^{-0.0453(x)} + 74$

plug in $y =$

19	120.52
20	118.46

19 minutes

120.52

120.5

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$T(0) = 100\,e^{-0.0453(0)} + 74$

$T(0) = 174\,°F$

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$\frac{\Delta y}{\Delta x}$ $\frac{153.73 - 174}{5 - 0} = -4.1$

Question 36 is continued on the next page.

Score 3: The student had a transcription error of 100 but calculated and interpreted the average rate of change appropriately.

Question 36 continued

Interpret the value of the average rate of change within the given context.

This means the temperature will decrease at an average rate of 4.1°F per minute.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$120 = 100e^{-0.0453x} + 74$

$-74 \quad -74$

$46 = 100e^{-0.0453x}$

$\log 46 = \log 100e^{-0.0453x}$

$\frac{\log 46}{-.453 \log 100e} = \frac{-.453x \log 100e}{-.453 \log 100e}$

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

0 minutes

$T(x) = 110e^{-0.0453x} + 74$

$T(0) = 110e^{-0.0453(0)} + 74$

$T(0) = 184°$

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$T(5) = 110e^{-0.0453(5)} + 74$

$T(5) = 161.7°$

Question 36 is continued on the next page.

Score 2: The student earned one credit on the first and last parts.

Question 36 continued

Interpret the value of the average rate of change within the given context.

Rate of change: 4.5° per minute

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

$T(19) = 110e^{-0.0453(19)} + 74 = 120.5°$

$T(20) = 118.5°$

19 minutes

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$110e^{-0.0453(0)} + 74 = 184$

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

(x_2, y_2) $(0, 184)$
(x_1, y_1) $(5, 161.71)$

$\frac{184 - 161.71}{0 - 5} = -5.5$

Question 36 is continued on the next page.

Score 2: The student earned one credit in the first and the second parts.

Question 36 continued

Interpret the value of the average rate of change within the given context.

this means that each minute the temperator decrease

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

184°

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

179.17
+ -161.7
17.473
5 = 3.5

Question 36 is continued on the next page.

Score 1: The student earned one credit for the first part.

Question 36 continued

Interpret the value of the average rate of change within the given context.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

19 minutes

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

110° degrees Fahrenheit

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

slope

$x_1 = 0$
$y_1 = 184$

$x_2 = 5$
$y_2 = 161.7051277$

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

average rate = 4.5

Question 36 is continued on the next page.

Score 1: The student earned one credit for the average rate of change.

Question 36 continued

Interpret the value of the average rate of change within the given context.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

around 19.3
or 19.2

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$T(x) = 110e^{-0.0453x} + 74$

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

184 161.7

$T(0) = 110e^{-0.0453(0)} + 74 = 184$

$T(5) = 110e^{-0.0453(5)} + 74 = 161.7$

Question 36 is continued on the next page.

Score 0: The student did not satisfy the criteria for one or more credits.

Question 36 continued

Interpret the value of the average rate of change within the given context.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

1 hour and 14 minutes

Question 36

36 Lubin pours green tea into a cup to cool. The function below can be used to model the temperature, in degrees Fahrenheit, of Lubin's tea x minutes after he pours it into the cup.

$$T(x) = 110e^{-0.0453x} + 74$$

State the temperature of the tea, in degrees Fahrenheit, when Lubin poured it into the cup.

$110e^{-0.0453(0)} + 74$

185

To the *nearest tenth*, use $T(x)$ to determine the average rate of change in degrees per minute, from $x = 0$ to $x = 5$.

$110e^{-0.0453(5)} + 74$

162.7051277

185
$-\ 162.7051277$
22.2948723

22.3

Question 36 is continued on the next page.

Score 0: The student did not satisfy the criteria for one or more credits.

Question 36 continued

Interpret the value of the average rate of change within the given context.

To the *nearest tenth of a minute*, determine how long Lubin must wait after pouring his tea into the cup before the tea's temperature reaches 120° Fahrenheit.

19.8 minutes

$110e^{-0.0453(19.8)} + 74$

119.8

120°

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

Regents Examination in Algebra II – AUGUST 2026

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

(Use for the August 2026 exam only.)

Raw Score	Scale Score	Performance Level
82	**100**	5
81	**98**	5
80	**97**	5
79	**96**	5
78	**94**	5
77	**93**	5
76	**92**	5
75	**91**	5
74	**90**	5
73	**89**	5
72	**89**	5
71	**88**	5
70	**87**	5
69	**87**	5
68	**86**	5
67	**86**	5
66	**85**	5
65	**84**	4
64	**84**	4
63	**83**	4
62	**83**	4
61	**82**	4
60	**82**	4
59	**81**	4
58	**80**	4
57	**80**	4
56	**79**	4
55	**79**	4

Raw Score	Scale Score	Performance Level
54	**78**	4
53	**78**	4
52	**77**	4
51	**77**	4
50	**76**	3
49	**76**	3
48	**75**	3
47	**74**	3
46	**74**	3
45	**73**	3
44	**73**	3
43	**72**	3
42	**72**	3
41	**71**	3
40	**71**	3
39	**70**	3
38	**70**	3
37	**69**	3
36	**68**	3
35	**68**	3
34	**67**	3
33	**67**	3
32	**66**	3
31	**66**	3
30	**65**	3
29	**64**	2
28	**63**	2
27	**63**	2

Raw Score	Scale Score	Performance Level
26	**62**	2
25	**62**	2
24	**61**	2
23	**60**	2
22	**59**	2
21	**58**	2
20	**57**	2
19	**56**	2
18	**55**	2
17	**53**	1
16	**52**	1
15	**50**	1
14	**49**	1
13	**47**	1
12	**45**	1
11	**42**	1
10	**40**	1
9	**37**	1
8	**34**	1
7	**31**	1
6	**27**	1
5	**24**	1
4	**20**	1
3	**15**	1
2	**11**	1
1	**5**	1
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 II.