INTEGRATED ALGEBRA

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

ÁLGEBRA INTEGRADA

Jueves, 18 de junio de 2015 — 9:15 a.m. a 12:15 p.m., solamente

Nombre del estudiante: _____

Nombre de la escuela: _____

La posesión o el uso de cualquier aparato destinado a la comunicación están estrictamente prohibidos mientras esté realizando el examen. Si usted tiene o utiliza cualquier aparato destinado a la comunicación, aunque sea brevemente, su examen será invalidado y no se calculará su calificación.

Escriba en letra de molde su nombre y el nombre de su escuela en las líneas de arriba.

Se le ha proporcionado una hoja de respuestas separada para la Parte I. Siga las instrucciones del supervisor para completar la información del estudiante en su hoja de respuestas.

Este examen tiene cuatro partes, con un total de 39 preguntas. Usted debe responder todas las preguntas de este examen. Escriba sus respuestas a las preguntas de selección múltiple de la Parte I en la hoja de respuestas separada. Escriba sus respuestas a las preguntas de las Partes II, III y IV directamente en este folleto. Todo el trabajo debe ser realizado con bolígrafo de tinta permanente, con excepción de los gráficos y los dibujos, que deben hacerse con lápiz grafito. Indique claramente los pasos necesarios, incluyendo apropiadamente las sustituciones de fórmulas, diagramas, gráficos, tablas, etc. Las fórmulas que podría necesitar para responder a ciertas preguntas se encuentran al final del examen. Esta hoja está perforada para que pueda desprenderla de este folleto.

No se permite el uso de papel de borrador para ninguna parte de este examen, pero puede usar los espacios en blanco en este folleto como papel de borrador. Una hoja perforada de papel cuadriculado de borrador está provista al final de este folleto para cualquier pregunta para la cual sea útil un gráfico, aunque no se requiere. Puede desprender esta hoja del folleto. Todo trabajo realizado en esta hoja de papel cuadriculado de borrador *no* será calificado.

Cuando haya terminado el examen, deberá firmar la declaración impresa al final de la hoja de respuestas, indicando que no tenía conocimiento ilegal previo de las preguntas o respuestas del examen y que no ha dado ni recibido asistencia alguna para responder a las preguntas durante el examen. Su hoja de respuestas no será aceptada si no firma dicha declaración.

Aviso...

Se le debe proporcionar una calculadora para hacer gráficos y una regla para que utilice mientras realiza el examen.

NO ABRA ESTE FOLLETO DE EXAMEN HASTA QUE SE LE INDIQUE.

Parte I

Responda las 30 preguntas de esta parte. Cada respuesta correcta recibirá 2 créditos. No se dará ningún crédito parcial. Para cada pregunta, escriba en la hoja de respuestas separada el número que precede a la palabra o expresión que mejor complete el enunciado o que mejor responda a la pregunta. [60]

Utilice este espacio para sus cálculos.

1 Si $A = \{1,2,3,4,5,6,7,8\}$ y $B = \{2,4,6,8,10,12\}$, entonces la intersección de estos dos conjuntos es

(1) $\{10,12\}$ (3) $\{2,4,6,8\}$

(2) $\{1,3,5,7\}$ (4) $\{1,2,3,4,5,6,7,8,10,12\}$

2 Hay 4 estudiantes postulados para Presidente del Gobierno Estudiantil. Se realizó una encuesta en la que se preguntó a 100 estudiantes por cuál candidato votarían en la elección. Los resultados se muestran en la siguiente tabla:

Nombre del candidato	Cantidad de seguidores
Ashley	30
Britney	28
Lyshon	14
Walker	28

Según la tabla, ¿cuál es la probabilidad de que un estudiante elegido al azar vote por Lyshon?

(1) $\dfrac{3}{10}$ (3) $\dfrac{7}{50}$

(2) $\dfrac{7}{25}$ (4) $\dfrac{43}{50}$

3 A continuación se muestra el gráfico de $y = x^2$.
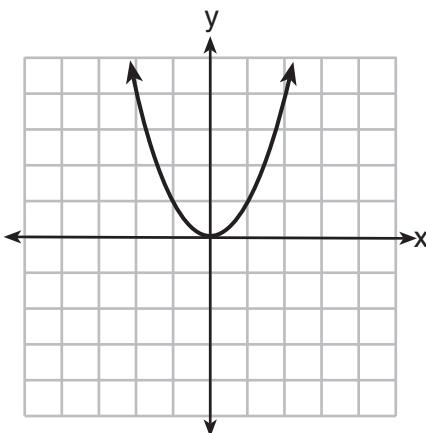
¿Qué gráfico representa $y = 2x^2$?

(1)

(3)

(2)

(4)

4 La tienda de delicatessen local cobra un cargo por hacer envíos a domicilio. El lunes, enviaron a una oficina dos docenas de bagels por un costo total de $8. El martes, enviaron tres docenas de bagels por un costo total de $11. ¿Qué sistema de ecuaciones se podría utilizar para calcular el costo de una docena de bagels, b, si el costo de envío es f?

(1) $b + 2f = 8$
    $b + 3f = 11$

(3) $b + 2f = 8$
    $3b + f = 11$

(2) $2b + f = 8$
    $b + 3f = 11$

(4) $2b + f = 8$
    $3b + f = 11$

5 ¿Qué desigualdad se muestra en el siguiente gráfico?
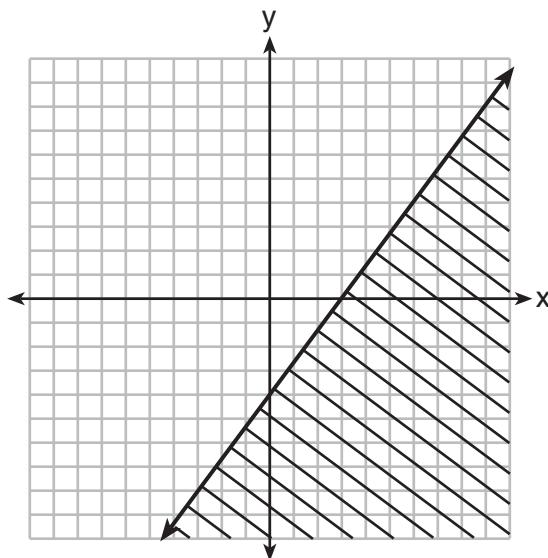
(1) $y \leq \frac{4}{3}x + 3$

(3) $y \leq \frac{4}{3}x - 4$

(2) $y \geq \frac{4}{3}x + 3$

(4) $y \geq \frac{4}{3}x - 4$

6 ¿Qué expresión es equivalente a $81 - 16x^2$?

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

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

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

(4) $(9 - 4x)(9 - 4x)$

7 ¿Qué valor de x es la solución de $\frac{1}{5} + \frac{2}{x} = \frac{1}{3}$?

(1) $-2\frac{3}{4}$ (3) $2\frac{3}{4}$

(2) -15 (4) 15

8 El producto de un número y 3, aumentado en 5, es igual a 7 menos que el doble del número. ¿Qué ecuación puede utilizarse para calcular este número, n?

(1) $3n + 5 = 2n - 7$ (3) $3(n + 5) = 2n - 7$

(2) $3n + 5 = 7 - 2n$ (4) $3(n + 5) = 7 - 2n$

9 ¿Qué ecuación linear representa una línea que tiene una pendiente de $\frac{2}{3}$?

(1) $-2y = -3x + 6$ (3) $3y = -2x + 6$

(2) $-3y = 2x + 6$ (4) $3y = 2x + 6$

10 ¿Qué situación es un ejemplo de datos bivariados?

(1) las tallas de calzado de un equipo de tenis

(2) los goles que anotaron en juegos de fútbol

(3) las calorías consumidas en un día

(4) las horas de estudio comparadas con los resultados del examen

11 ¿Cuál es la solución del siguiente sistema de ecuaciones?

$$2a + 3b = 12$$

$$a = \frac{1}{2}b - 6$$

(1) $a = -6$ y $b = 0$ (3) $a = -3$ y $b = 6$

(2) $a = -4.5$ y $b = 3$ (4) $a = 24$ y $b = 6$

12 ¿Qué enunciado es verdadero acerca de los datos que se muestran en el siguiente diagrama de dispersión?
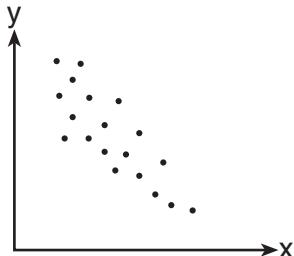
(1) No hay correlación entre los dos conjuntos de datos.

(2) Hay una correlación positiva entre los dos conjuntos de datos.

(3) Hay una correlación negativa entre los dos conjuntos de datos.

(4) La correlación entre los datos es tanto positiva como negativa.

13 El gráfico de la ecuación $y = -2$ es una línea

(1) paralela al eje x

(2) paralela al eje y

(3) que pasa a través del origen

(4) que pasa a través del punto $(-2,0)$

14 La base de un cilindro circular recto cerrado tiene un diámetro de 5 cm. Si la altura del cilindro es de 8 cm, ¿cuál es el área de la superficie del cilindro, al *centímetro cuadrado más cercano*?

(1) 157   (3) 408

(2) 165   (4) 628

15 ¿Qué ecuación representa la línea que pasa a través de los puntos $(-1,-2)$ y $(3,10)$?

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

(2) $y = 3x - 1$ (4) $y = 4x - 2$

16 Como se muestra en el siguiente diagrama, un edificio proyecta una sombra de 72 pies en el piso cuando el ángulo de elevación del Sol es de 40°.
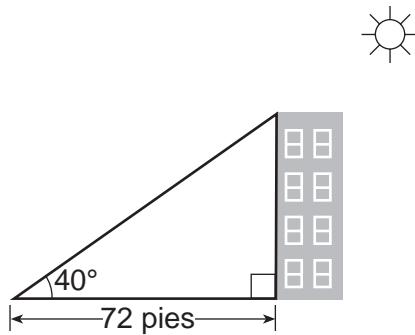
¿Qué tan alto es el edificio, al *pie más cercano*?

(1) 46   (3) 86

(2) 60   (4) 94

17 ¿Qué valor de x es una solución a la desigualdad $25x - 100 < 250$?

(1) 13   (3) 15

(2) 14   (4) 16

18 El cuadrado de un número positivo es 24 más que 5 veces el número. ¿Cuál es el valor del número?

(1) 6   (3) 3

(2) 8   (4) 4

19 Owino recibe un pago de $280 por semana más un 5% de comisión por todas las ventas de equipos electrónicos que hace. Si vende n dólares en equipos electrónicos en una semana, ¿qué expresión algebraica representa la cantidad de dinero que ganará esa semana?

(1) $280n + 5$ (3) $280 + 0.05n$

(2) $280n + 0.05$ (4) $280 + 5n$

20 ¿Qué valor de x hace que la expresión $\dfrac{x+9}{3x-6}$ sea indefinida?

(1) -9 (3) -3

(2) 2 (4) 0

21 Se debe empaquetar un total de 1680 onzas de alimento para mascotas en bolsas de 5 libras. ¿Cuántas bolsas de 5 libras de alimento para mascotas podrán empaquetarse?

> 1 libra = 16 onzas

(1) 21 (3) 105

(2) 28 (4) 336

22 Para una clase de estudiantes, ¿qué conjunto de datos podría clasificarse como cualitativo?

(1) opiniones políticas   (3) pesos

(2) estaturas   (4) edades

23 En el triángulo rectángulo *EFD*, *ED* = 11, *EF* = 6 y m∠*F* = 90. ¿Cuál es la medida del ángulo *E*, al *grado más cercano*?

(1) 61 (3) 33

(2) 57 (4) 29

24 Si $z + y = x + xy^2$, ¿qué es x expresado en términos de y y z?

(1) $\dfrac{z}{y}$ (3) $\dfrac{z+1}{y}$

(2) $\dfrac{z}{1+y}$ (4) $\dfrac{z+y}{1+y^2}$

25 La Sra. Porter registró las calificaciones de sus estudiantes en la siguiente tabla de frecuencias.

Calificación	Frecuencia
96	2
92	5
88	3
84	2
78	4
60	1

¿Qué enunciado es verdadero para los datos?

(1) media > mediana > modo   (3) modo > mediana > media

(2) media > modo > mediana   (4) mediana > media > modo

26 ¿El uso de qué propiedad ilustra la ecuación $(x - 6)(8 + x) = (x - 6) \cdot (8) + (x - 6) \cdot (x)$?

(1) propiedad distributiva

(2) propiedad asociativa de la suma

(3) propiedad asociativa de la multiplicación

(4) propiedad conmutativa de la multiplicación

27 Si $(7.6 \times 10^n)(3.5 \times 10^3) = 2.66 \times 10^9$, ¿cuál es el valor de n?

(1) 6   (3) 3

(2) 5   (4) 7

28 ¿Qué valor es equivalente al producto de $4\sqrt{2}$ y $2\sqrt{6}$?

(1) $16\sqrt{3}$ (3) $6\sqrt{8}$

(2) $6\sqrt{12}$ (4) $24\sqrt{2}$

29 El conjunto de números enteros [6,10) puede escribirse como

(1) {6, 7, 8, 9, 10}   (3) {6, 7, 8, 9}

(2) {7, 8, 9, 10}   (4) {7, 8, 9}

30 Un tanque rectangular mide 5 pies de largo, 4 pies de ancho y 3 pies de alto. Se vierte agua dentro del tanque hasta llegar a una profundidad de $2\frac{1}{2}$ pies. ¿Cuántos pies cúbicos de agua hay en el tanque?

(1) 60   (3) 15.5

(2) 50   (4) 11.5

**Responda las 3 preguntas de esta parte. Cada respuesta correcta recibirá 2 créditos. Indique claramente los pasos necesarios, incluyendo apropiadamente las sustituciones de fórmulas, diagramas, gráficos, tablas, etc. Para todas las preguntas en esta parte, una respuesta numérica correcta sin demostrar el trabajo recibirá solamente 1 crédito. Todas las respuestas deben escribirse con bolígrafo de tinta permanente, con excepción de los gráficos y los dibujos, que deben hacerse con lápiz grafito.** [6]

31 Jen viajó una distancia de 170 millas en 2 horas y 45 minutos. Exprese su velocidad, en millas por hora, a la *décima más cercana*.

32 Como se muestra a continuación, el polígono *ABCGFED* se compone de dos cuadrados, *ABCD* y *CGFE*, y de un triángulo equilátero *CED*. La longitud de $\overline{BC}$ es de $\sqrt{3}$ cm. Determine el perímetro del polígono *ABCGFED* en forma radical.
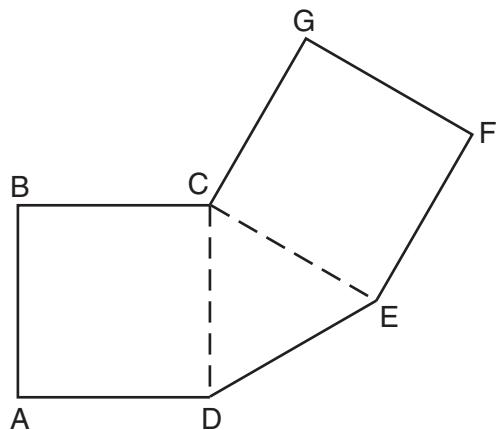
33 Escriba una ecuación cuadrática en forma estándar que tenga raíces de -12 y 2.

Parte III

Responda las 3 preguntas de esta parte. Cada respuesta correcta recibirá 3 créditos. Indique claramente los pasos necesarios, incluyendo apropiadamente las sustituciones de fórmulas, diagramas, gráficos, tablas, etc. Para todas las preguntas en esta parte, una respuesta numérica correcta sin demostrar el trabajo recibirá solamente 1 crédito. Todas las respuestas deben escribirse con bolígrafo de tinta permanente, con excepción de los gráficos y los dibujos, que deben hacerse con lápiz grafito. [9]

34 Encuentre algebraicamente la ecuación del eje de simetría y del vértice de la parábola representada por la ecuación $y = -x^2 - 2x + 1$.

35 Linda mide la ventana rectangular de su habitación para comprar una persiana nueva. Las medidas que tomó fueron 36 pulgadas por 42 pulgadas. Las medidas reales de la ventana son 36.5 pulgadas y 42.5 pulgadas. Determine el error relativo al calcular el área. Exprese su respuesta como un decimal a la *milésima más cercana*.

36 El siguiente conjunto de datos representa las estaturas, en pulgadas, de los 20 estudiantes de la clase de primer año de la Sra. Fitzgerald:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

Complete la siguiente tabla de frecuencias.

Estaturas de los estudiantes

Intervalo	Conteo	Frecuencia
55–59		
60–64		
65–69		
70–74		

En la siguiente cuadrícula, dibuje y rotule un histograma de frecuencias para estos datos.
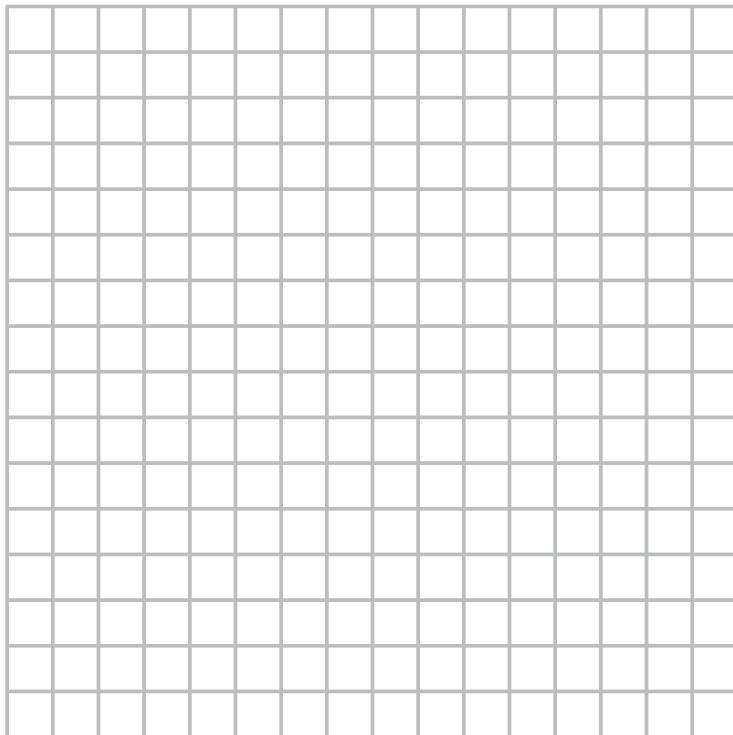
Parte IV

Responda las 3 preguntas de esta parte. Cada respuesta correcta recibirá 4 créditos. Indique claramente los pasos necesarios, incluyendo apropiadamente las sustituciones de fórmulas, diagramas, gráficos, tablas, etc. Para todas las preguntas en esta parte, una respuesta numérica correcta sin demostrar el trabajo recibirá solamente 1 crédito. Todas las respuestas deben escribirse con bolígrafo de tinta permanente, con excepción de los gráficos y los dibujos, que deben hacerse con lápiz grafito. [12]

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37 En el conjunto de ejes que se muestra a continuación, grafique $y = 2x^2 - 4x - 6$.

Indique las raíces de $0 = 2x^2 - 4x - 6$.

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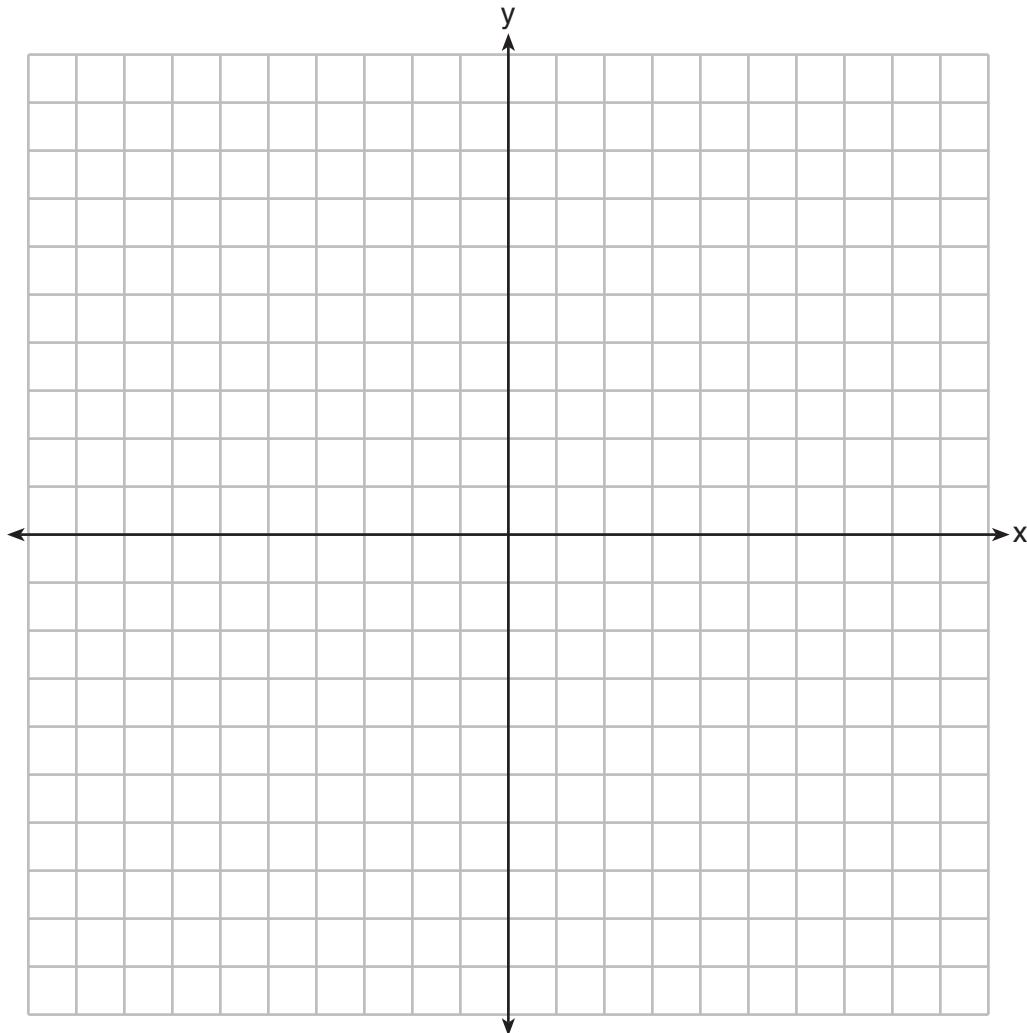
38 La longitud de un rectángulo está representada por $x^2 + 3x + 2$, y el ancho está representado por $4x$.

Exprese el perímetro del rectángulo como un trinomio.

Exprese el área del rectángulo como un trinomio.

39 Tony hace una llamada desde un teléfono público. El costo es de 25 centavos por los primeros cuatro minutos y 10 centavos por cada minuto adicional. Tony tiene $2.10 en suelto en su bolsillo. Escriba una desigualdad que pueda usarse para encontrar m, la cantidad máxima de minutos que Tony puede hablar por teléfono.

Resuelva algebraicamente esta desigualdad para encontrar el número máximo de minutos enteros que puede hablar por teléfono.
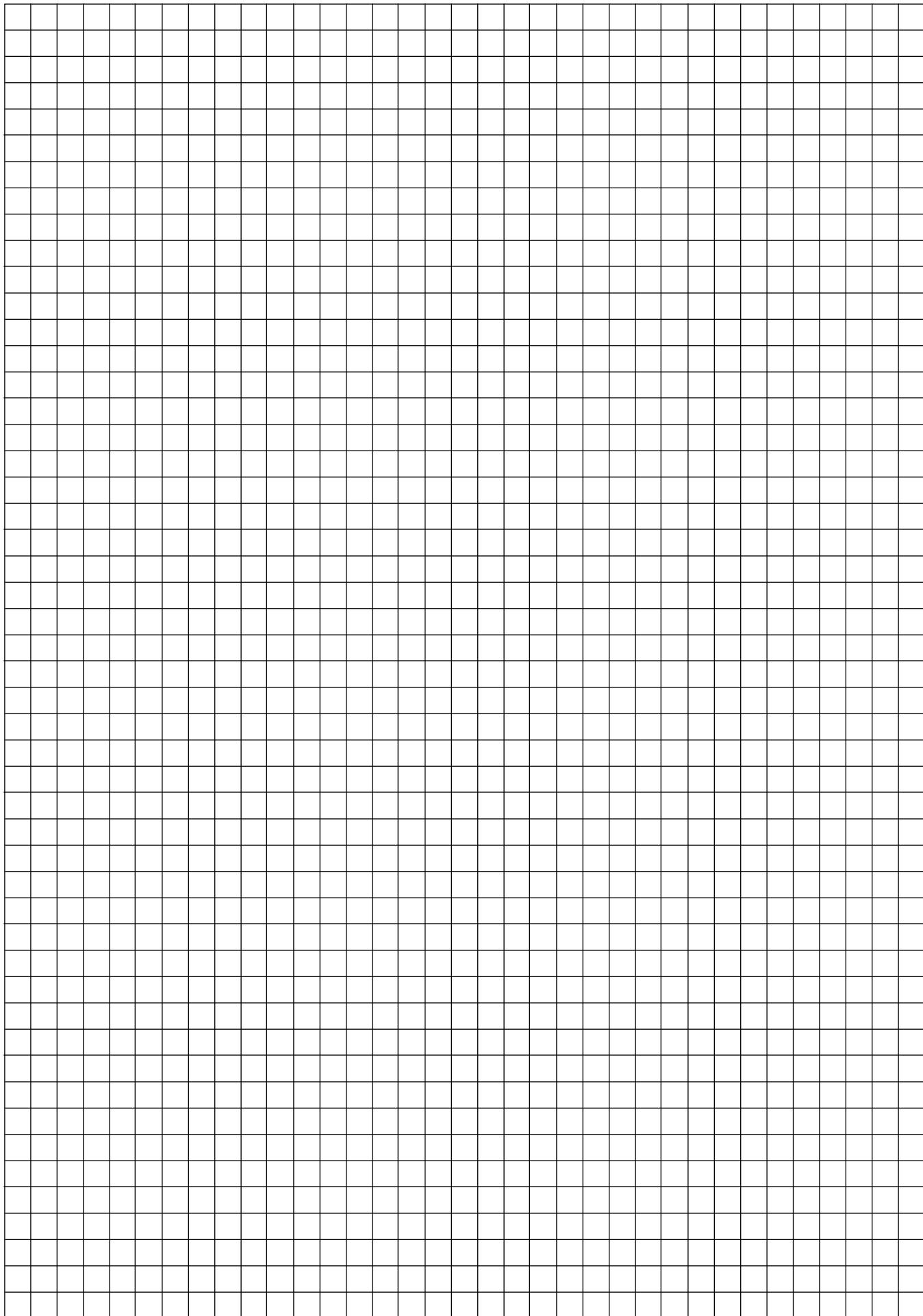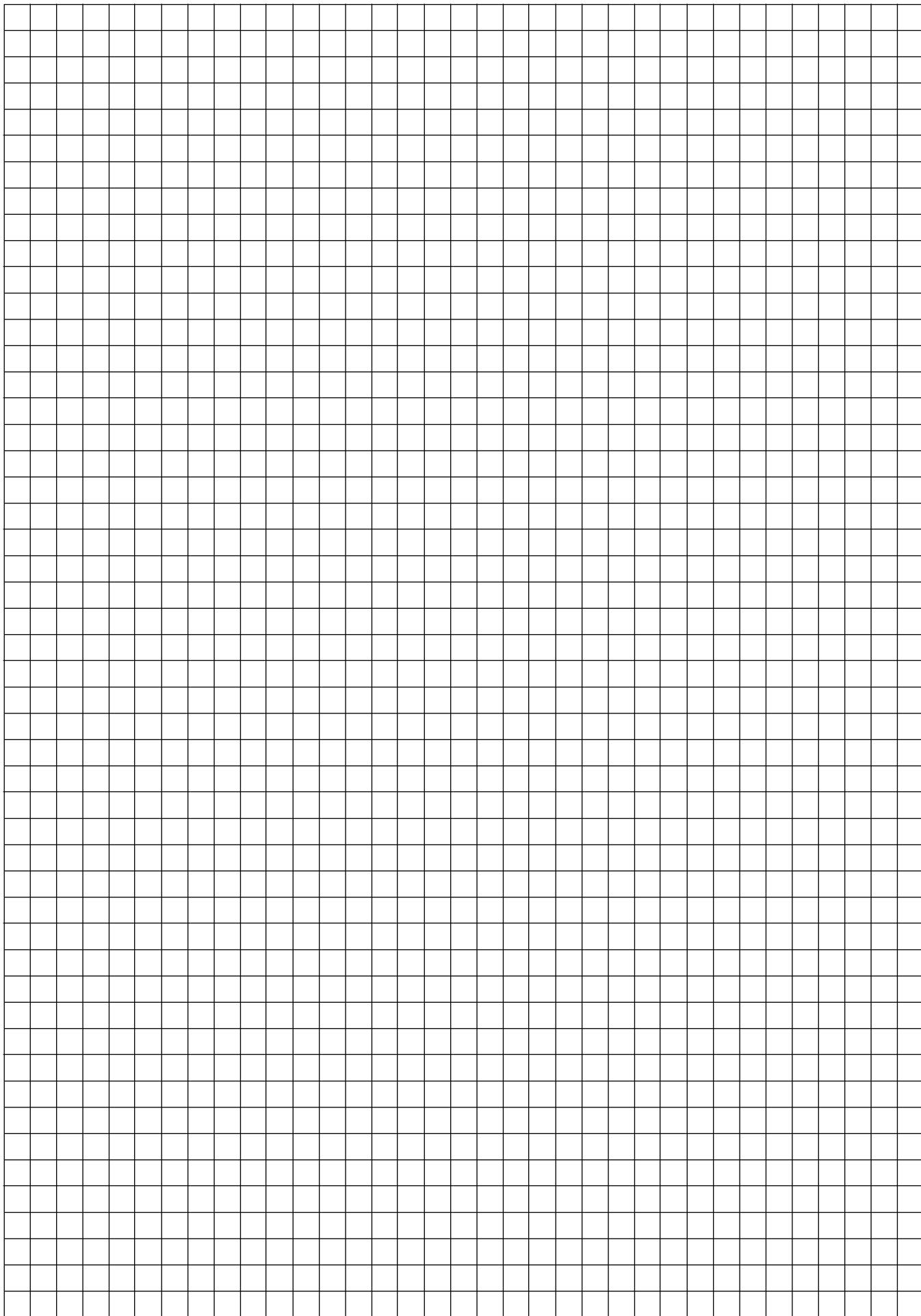
Hoja de referencia

Razones trigonométricas	$\text{sen } A = \dfrac{opuesto}{hipotenusa}$
	$\cos A = \dfrac{adyacente}{hipotenusa}$
	$\tan A = \dfrac{opuesto}{adyacente}$

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

Volumen	cilindro	$V = \pi r^2 h$

Área de superficie	prisma rectangular	$SA = 2lw + 2hw + 2lh$
	cilindro	$SA = 2\pi r^2 + 2\pi rh$

Geometría analítica	$m = \dfrac{\Delta y}{\Delta x} = \dfrac{y_2 - y_1}{x_2 - x_1}$

INTEGRATED ALGEBRA SPANISH EDITION

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FOR TEACHERS ONLY

INTEGRATED ALGEBRA

Thursday, June 18, 2015 — 9:15 a.m. to 12:15 p.m., only

SCORING KEY AND RATING GUIDE

Mechanics of Rating

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

Do *not* attempt to correct the student's work by making insertions or changes of any kind. In scoring the open-ended 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 open-ended questions on a student's paper. Teachers may not score their own students' answer papers. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

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

Raters should record the student's scores for all questions and the total raw score on the student's separate answer sheet. Then the student's total raw score should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Thursday, June 18, 2015. Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score. The student's scale score should be entered in the box provided on the student's separate answer sheet. The scale score is the student's final examination score.

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

Part I

Allow a total of 60 credits, 2 credits for each of the following.

(1) 3	(11) 3	(21) . . . . . 1 . . . . .
(2) 3	(12) 3	(22) . . . . . 1 . . . . .
(3) 4	(13) 1	(23) . . . . . 2 . . . . .
(4) 4	(14) 2	(24) . . . . . 4 . . . . .
(5) 3	(15) 1	(25) . . . . . 3 . . . . .
(6) 3	(16) 2	(26) . . . . . 1 . . . . .
(7) 4	(17) 1	(27) . . . . . 2 . . . . .
(8) 1	(18) 2	(28) . . . . . 1 . . . . .
(9) 4	(19) 3	(29) . . . . . 3 . . . . .
(10) 4	(20) 2	(30) . . . . . 2 . . . . .

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

Beginning in January 2013, the Department is providing supplemental scoring guidance, the "Sample Response Set," for the Regents Examination in Integrated Algebra. This guidance is not required as part of the scorer training. It is at the school's discretion to incorporate it into the scorer training or to use it as supplemental information during scoring. While not reflective of all scenarios, the sample student responses selected for the Sample Response Set illustrate how less common student responses to open-ended questions may be scored. The Sample Response Set will be available on the Department's web site at http://www.nysedregents.org/IntegratedAlgebra/.

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examination in Integrated Algebra are designed to provide a systematic, consistent method for awarding credit. The rubrics are not to be considered all-inclusive; it is impossible to anticipate all the different methods that students might use to solve a given problem. Each response must be rated carefully using the teacher's professional judgment and knowledge of mathematics; all calculations must be checked. The specific rubrics for each question must be applied consistently to all responses. In cases that are not specifically addressed in the rubrics, raters must follow the general rating guidelines in the publication *Information Booklet for Scoring the Regents Examinations in Mathematics*, 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 any response. 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. A response with one conceptual error can receive no more than half credit.

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.

If a response shows two (or more) different major conceptual errors, it should be considered completely incorrect and receive no credit.

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; i.e., awarding half credit for the conceptual error and deducting 1 credit for each mechanical error (maximum of two deductions for mechanical errors).

Part II

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

(31)   **[2]** 61.8, and correct work is shown.

[1] An appropriate expression is shown, but one computational or rounding error is made.

or

[1] An appropriate expression is shown, but one conceptual error is made.

or

[1] $\dfrac{170}{2\frac{3}{4}}$ or an equivalent expression, but no further correct work is shown.

or

[1] 61.8, but no work is shown.

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

(32)   **[2]** $7\sqrt{3}$ and correct work is shown, such as a labeled diagram.

[1] Appropriate work is shown, but one computational error is made. An appropriate perimeter is found.

or

[1] Appropriate work is shown, but one conceptual error is made. An appropriate perimeter is found.

or

[1] Appropriate work is shown, but the perimeter is expressed as a decimal.

or

[1] $7\sqrt{3}$, but not work is shown.

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

(33)   **[2]** $x^2 + 10x - 24 = 0$, and correct work is shown.

[1] Appropriate work is shown, but one computational error is made. An appropriate quadratic equation is written.

or

[1] Appropriate work is shown, but one conceptual error is made, such as writing the expression $x^2 + 10x - 24$.

or

[1] $(x + 12)(x - 2) = 0$, but no further correct work is shown.

or

[1] $x^2 + 10x - 24 = 0$, but no work is shown.

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

Part III

For each question, use the specific criteria to award a maximum of 3 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(34)   **[3]** $x = -1$ and $(-1,2)$ or equivalent, and correct algebraic work is shown.

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

or

[2] Appropriate work is shown to find $(-1,2)$, but the axis of symmetry is not stated or is stated incorrectly.

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

or

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

or

[1] Appropriate work is shown to find $x = -1$, but no further correct work is shown.

or

[1] $x = -1$ and $(-1,2)$, but a method other than algebraic is used.

or

[1] $x = -1$ and $(-1,2)$, but no work is shown.

[0] $x = -1$ or $(-1,2)$, but no work is shown.

or

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

(35)　　**[3]** 0.025 and correct work is shown.

　　　　[2] Appropriate work is shown, but one computational or rounding error is made.
　　　　　　An appropriate answer is found.

<div align="center">***or***</div>

　　　　[2] $\dfrac{39.25}{1551.25}$ is written, but no further correct work is shown.

　　　　[1] Appropriate work is shown, but two or more computational errors are made.
　　　　　　An appropriate answer is found.

<div align="center">***or***</div>

　　　　[1] Appropriate work is shown, but one conceptual error is made. An appropriate
　　　　　　answer is found.

<div align="center">***or***</div>

　　　　[1] $\dfrac{1551.25 - 1512}{1551.25}$ is written, but no further correct work is shown.

<div align="center">***or***</div>

　　　　[1] 0.025, but no work is shown.

　　　　[0] Appropriate work is shown to find 1512 and 1551.25, but no further correct
　　　　　　work is shown.

<div align="center">***or***</div>

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

(36) **[3]** The frequency table is completed correctly, and a correct frequency histogram is drawn and labeled.

[2] The frequency table is completed correctly, but one graphing or labeling error is made.

or

[2] An incorrect frequency table is shown, but an appropriate frequency histogram is drawn and labeled.

[1] The frequency table is completed correctly, but two or more graphing or labeling errors are made.

or

[1] Appropriate work is shown, but one conceptual error is made, such as drawing a bar graph.

or

[1] The frequency table is completed correctly, but no further correct work is shown.

or

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

Part IV

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.

(37)   **[4]** A correct graph is drawn and -1 and 3 are stated.

[3] One graphing error is made. Appropriate roots are stated.

or

[3] A correct graph is drawn, but only -1 or 3 is stated.

or

[3] A correct graph is drawn, but the roots are expressed as the coordinates $(-1,0)$ and $(3,0)$.

[2] Two or more graphing errors are made. Appropriate roots are stated.

or

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

or

[2] Appropriate work is shown to find -1 and 3, but no graph is drawn.

or

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

[1] Two or more graphing errors are made and roots are stated incorrectly or not stated.

or

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

or

[1] -1 and 3 are stated, but no graph or work is shown.

[0] $(-1,0)$ and $(3,0)$ are stated, but no graph is drawn.

or

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

(38) **[4]** Perimeter $2x^2 + 14x + 4$ and area $4x^3 + 12x^2 + 8x$, and correct work is shown.

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

or

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

or

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

or

[2] Appropriate work is shown to find either perimeter $2x^2 + 14x + 4$ or area $4x^3 + 12x^2 + 8x$.

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

or

[1] Perimeter $2x^2 + 14x + 4$ and area $4x^3 + 12x^2 + 8x$, but no work is shown.

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

(39)　　**[4]** $0.25 + 0.10(m - 4) \leq 2.10$ or an equivalent is written, and 22, and correct work is shown.

[3] A correct inequality is written, but one computational error is made. An appropriate number of minutes is stated.

or

[3] A correct inequality is written and solved to find $m \leq 22.5$, but no further correct work is shown.

[2] A correct inequality is written, but two or more computational errors are made.

or

[2] Appropriate work is shown, but one conceptual error is made. An appropriate number of minutes is stated.

or

[2] $0.25 + 0.10m \leq 2.10$ is written, and 18, and appropriate work is shown.

or

[2] A correct inequality is written, but no further correct work is shown.

or

[2] 22, but a method other than algebraic is used.

[1] Appropriate work is shown, but one conceptual error and one computational error are made. An appropriate number of minutes is stated.

or

[1] $0.25 + 0.10m \leq 2.10$ is written and solved to find $m \leq 18.5$, but no further correct work is shown.

or

[1] 22, but no work is shown.

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

Map to Core Curriculum

Content Strands	Item Numbers
Number Sense and Operations	26, 27, 28
Algebra	1, 4, 5, 6, 7, 8, 9, 11, 13, 15, 16, 17, 18, 19, 20, 23, 24, 29, 33, 34, 38, 39
Geometry	3, 14, 30, 32, 37
Measurement	21, 31, 35
Statistics and Probability	2, 10, 12, 22, 25, 36

Regents Examination in Integrated Algebra

June 2015

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

The *Chart for Determining the Final Examination Score for the June 2015 Regents Examination in Integrated Algebra* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Thursday, June 18, 2015. Conversion charts provided for previous administrations of the Regents Examination in Integrated Algebra must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

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

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

2. Select the test title.

3. Complete the required demographic fields.

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

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

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

INTEGRATED ALGEBRA

Thursday, June 18, 2015 — 9:15 a.m. to 12:15 p.m., only

SAMPLE RESPONSE SET

Table of Contents

31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the *nearest tenth*.

$$\frac{170 \text{ miles}}{2\text{hr } 45\text{mins}} \longrightarrow 61.81$$

$$61.8$$

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

31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the *nearest tenth*.

$$\frac{170}{165} \rightarrow 1.030\overline{303} \quad (60) \Rightarrow 61.81$$

$$61.8$$

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

31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the *nearest tenth*.

$$2:45$$
$$= 2.75$$

$$\frac{170}{2.75} = 61.818$$
$$= 61.82$$

Score 1: The student made one error by rounding to the wrong decimal place.

31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the *nearest tenth*.

$$\frac{170}{2 \cdot 45} \rightarrow 69.387551$$

Score 0: The student made one conceptual error and one rounding error.

31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the *nearest tenth*.

$$\frac{170}{165} = 1.0303$$

$$\approx 1.03$$

Score 0: The student made one conceptual error by finding miles per minutes and did not round correctly.

32 As shown below, polygon *ABCGFED* consists of two squares, *ABCD* and *CGFE*, and an equilateral triangle *CED*. The length of $\overline{BC}$ is $\sqrt{3}$ cm. Determine the perimeter of polygon *ABCGFED* in radical form.
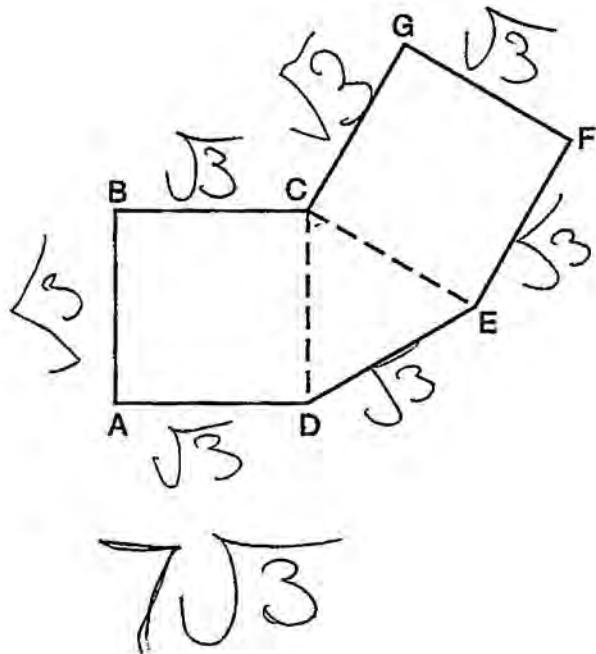
Score 2: The student has a complete and correct response.

32 As shown below, polygon *ABCGFED* consists of two squares, *ABCD* and *CGFE*, and an equilateral triangle *CED*. The length of $\overline{BC}$ is $\sqrt{3}$ cm. Determine the perimeter of polygon *ABCGFED* in radical form.
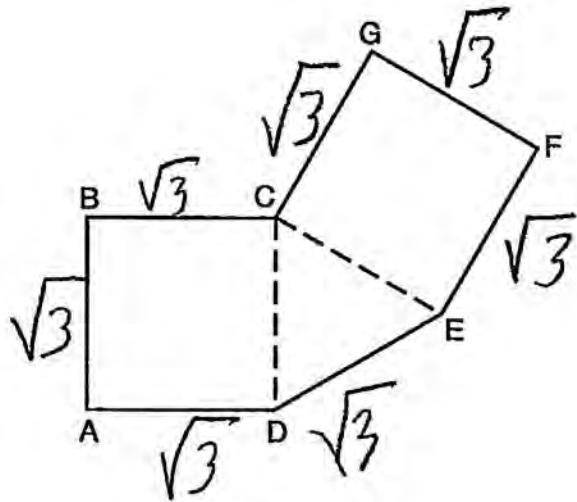
Score 2: The student expressed the perimeter as the product of the number of sides and the length of a side. The student then wrote a radical equivalent to $7\sqrt{3}$.

32 As shown below, polygon *ABCGFED* consists of two squares, *ABCD* and *CGFE*, and an equilateral triangle *CED*. The length of $\overline{BC}$ is $\sqrt{3}$ cm. Determine the perimeter of polygon *ABCGFED* in radical form.
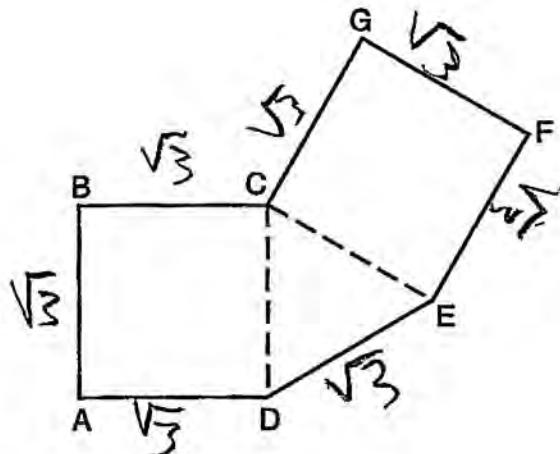
Score 1: The student showed correct work to find $\sqrt{3} \times 7$, but identified the decimal as the answer.

32 As shown below, polygon *ABCGFED* consists of two squares, *ABCD* and *CGFE*, and an equilateral triangle *CED*. The length of $\overline{BC}$ is $\sqrt{3}$ cm. Determine the perimeter of polygon *ABCGFED* in radical form.
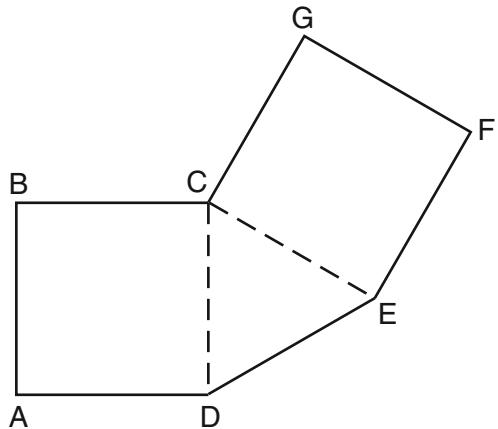
Score 1: The student has the correct response, but no work is shown.

32 As shown below, polygon *ABCGFED* consists of two squares, *ABCD* and *CGFE*, and an equilateral triangle *CED*. The length of $\overline{BC}$ is $\sqrt{3}$ cm. Determine the perimeter of polygon *ABCGFED* in radical form.
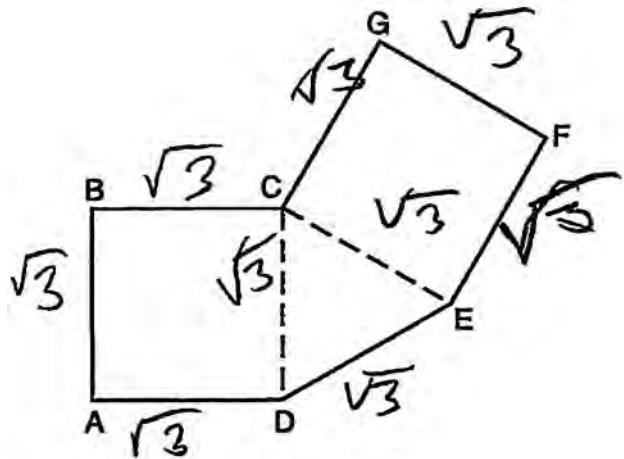
$$\sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} = \sqrt{21}$$

Perimiter of
figure ABCGfeD $\sqrt{21}$ cm.

Score 1: The student showed appropriate work to find the perimeter, but made a conceptual error when adding the radicals.

32 As shown below, polygon *ABCGFED* consists of two squares, *ABCD* and *CGFE*, and an equilateral triangle *CED*. The length of $\overline{BC}$ is $\sqrt{3}$ cm. Determine the perimeter of polygon *ABCGFED* in radical form.
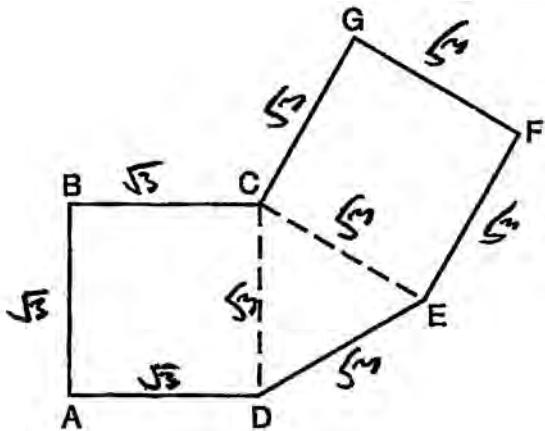
Perimeter= 9√3

Score 1: The student made a conceptual error by including all the sides of the equilateral triangle when calculating the perimeter of polygon ABCGFED.

32 As shown below, polygon *ABCGFED* consists of two squares, *ABCD* and *CGFE*, and an equilateral triangle *CED*. The length of $\overline{BC}$ is $\sqrt{3}$ cm. Determine the perimeter of polygon *ABCGFED* in radical form.
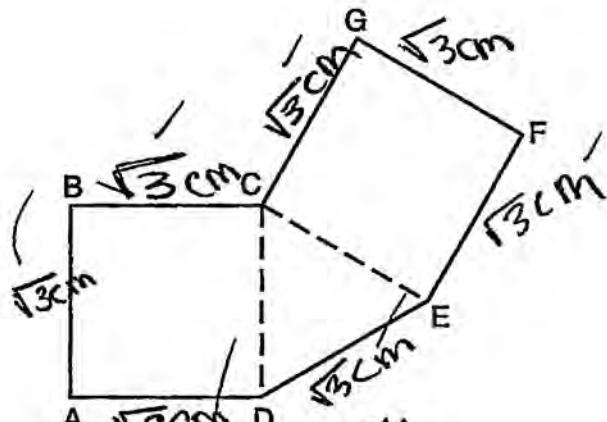
Score 0: The student made more than one error when finding the perimeter.

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$(x+12)(x-2)=0$$

$$x^2 + 12x - 2x - 24 = 0$$

$$x^2 + 10x - 24 = 0$$

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

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$x = -12 \qquad x = 2$$
$$\underline{+12 \quad +12} \quad \underline{-2 \quad 2}$$
$$x + 12 = 0 \qquad x - 2 = 0$$
$$(x + 12)(x - 2)$$
$$x^2$$
$$-2x + 12x$$
$$- 24$$
$$\boxed{x^2 + 10x - 24}$$
$$ans.$$

$$x^2 + 10x - 24$$
$$(x + 12)(x - 2)$$
$$0 = x + 12 \qquad x - 2 = 0$$
$$\underline{-12 \quad -12} \qquad \underline{+2 \quad +2}$$
$$-12 = x \qquad x = 2$$

Score 1: The student showed appropriate work, but wrote an expression instead of an equation.

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$(x+12)(x-2)=0$$

$$x^2+10-24=0$$

Score 1: The student wrote a correct equation in factored form but forgot "x" on the middle term when multiplying the factors.

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$x = -12 \qquad x = 2$$
$$\frac{+12 \quad +12}{x+12} \qquad \frac{+2 \quad +2}{x+2}$$

$$(x+12)(x+2) = 0$$

$$x^2 + 2x + 12x + 24 = 0$$

$$\boxed{x^2 + 14x + 24 = 0}$$

Score 1: The student made an error in writing the second factor of the equation, but wrote an appropriate quadratic equation.

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$X = -12$$
$$X = 2$$
$$=$$

$$0 = (X + 12)(X - 2)$$

$$X = -12$$
$$X = +2$$

Score 1: The student wrote a correct equation in factored form, but showed no further correct work.

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$x = -12 \qquad x = 2$$
$$x + 12 = 0 \qquad x - 2 = 0$$
$$(x + 12) \cdot (x - 2)$$
$$x^2 - 2x + 12x - 24$$
$$x^2 + 10x - 24$$
$$\boxed{y = x^2 + 10x - 24}$$

Score 1: The student showed appropriate work, but set the correct expression equal to y.

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$x^2 + 24 - 14 = 0$$
$$(x + 12)(x - 2)$$

$x + 12 = 0$	$x - 2 = 0$
$-12 - 12$	$+2 +2$
$x = -12$	$x = +2$

Score 0: The student wrote the expression $(x + 12)(x - 2)$, but showed no further correct work.

33 Write a quadratic equation in standard form that has roots of -12 and 2.

$$(x - 12)(x + 2)$$

$$x^2 + 2x - 24$$
$$\underline{-12x}$$
$$\boxed{x^2 - 10x - 24}$$

Score 0: The student wrote incorrect factors and did not write an equation.

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

$a = -1$

$b = -2$

$c = 1$

$$x = \frac{-b}{2a}$$

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

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

$$\boxed{x = -1}$$

$-(-1)^2 - 2(-1) + 1$

$-1 + 2 + 1$

$-1 + 3$

2

$\boxed{(-1, 2)}$

Score 3: The student has a complete and correct response.

Question 34

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

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

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

A of S: $x = 1$

$$y = -1 - 2 + 1$$
$$y = -2$$

$$(1, -2)$$

Score 2: The student made an error in finding the axis of symmetry, but found an appropriate vertex.

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

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

$$y = -(-1)^2 - 2(-1) + 1 = 2$$

$$(-1, 2)$$

Score 2: The student showed appropriate work to find the vertex, but did not state the axis of symmetry correctly.

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

$$\frac{-B}{2A} = \frac{-(-2)}{2(-1)} = \frac{2}{-2} = -1$$

$$y = -(-1)^2 - 2(-1) + 1$$
$$-1 + 2 + 1$$
$$1 + 1$$
$$2$$

$$\boxed{-1, 2}$$

Score 1: The student forgot to write "x" in the equation for the axis of symmetry and did not write parentheses around the coordinates of the vertex.

Question 34

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

$$x = -1$$

$$(-1, 2)$$

used a TI

Score 1: The student wrote a correct response, but showed no work.

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

$$\text{axis of symmetry}$$

$$-\frac{b}{2a} = \frac{2}{-2} = -1$$

$$x = -1$$

Score 1: The student showed appropriate work to find the axis of symmetry, but showed no further work.

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

$$-x^2 - 2x + 1 = 0$$

$$x^2 + 2x - 1 = 0$$

$$x^2 + 2x = 1$$

$$x(x+2) = 1$$

$$X = 1 \qquad \text{OR} \quad X = -2$$
$$\text{(AXIS)} \qquad\qquad \text{(VTX)}$$

Score 0: The work done by the student was completely incorrect.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

$$\frac{1551.25 - 1512}{1551.25}$$

$$\frac{39.25}{1551.25}$$

.025302\,1757

.025
relative error

Score 3: The student has a complete and correct response.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

$$RE = \frac{|measured - actual|}{actual}$$

$$RE = \frac{|1512 - 1551.5|}{1551.5}$$

$$RE = 0.025$$

$36 \cdot 42 = 1512$

$36.5 \cdot 42.5 = 1551.5$

Score 3: The student has a complete and correct response.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

$$\frac{|actual - observed|}{actual}$$

actual

36.5

L |2.5

L·W = A

12.5×36.5 = 1551.25

observed

36
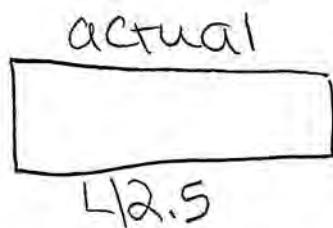
L·W = A

42× 36 = 1512

$$RE = \frac{1551.25 - 1512}{1551.25}$$

RE = .03 inches

Score 2: The student rounded to the nearest hundredth instead of thousandth.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

$$36 \cdot 42 = 1512$$
$$36.5 \cdot 42.5 = 1551.25$$

$$\frac{1551.25 - 1512}{1551.25} \cdot 100 = 2,530\ \%$$

Score 2: The student made an error by expressing the relative error as a percentage.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

measured – 63 · 42

$$\begin{array}{r} 63 \\ \times\ 42 \\ \hline 2646 \end{array}$$

actual – 36.5 · 42.5

$$\begin{array}{r} 36.5 \\ \times\ 42.5 \\ \hline 1551.25 \end{array}$$

Relative error = $\dfrac{|2646 - 1551.25|}{1551.25}$

Relative error = $\dfrac{1094.75}{1551.25}$

relative error = .7057211926

The relative error is .705

Score 1: The student made a transcription error when finding the measured area and made a rounding error when finding the relative error.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

36.5

42.5   42.5

36.5

(Not Drawn to Scale)

42
× 36
1512

42.5 × 36.5=1551.25
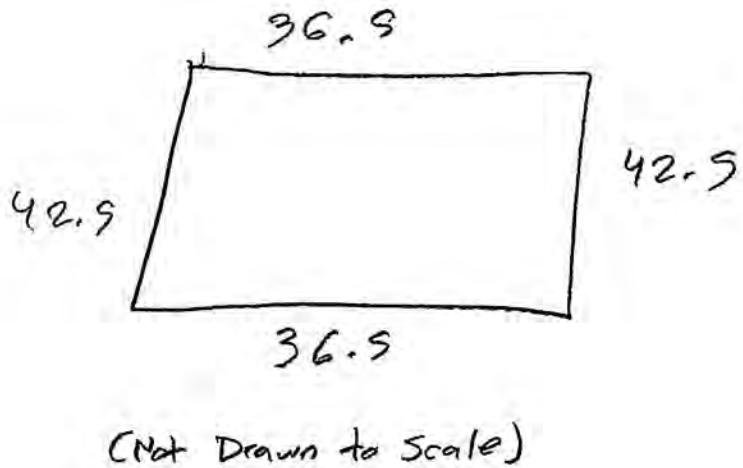
1551.25
− 1512.00
39.25 in error

Score 1: The student made a conceptual error by finding the amount of error instead of the relative error.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

Relative error = $\dfrac{H^{\#} - L^{\#}}{Actual^{\#}}$

Relative error =

$\dfrac{1551.25 - 1512}{1512} = \dfrac{39.25}{1512} = 38.52$

Relative error = 38.52

Score 0: The student used an incorrect formula, divided incorrectly, and did not round to the correct decimal place.

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

$$\frac{1551.25}{1512} = 1.025958995$$

36   36.5
· 42   · 42.5
‾‾‾‾   ‾‾‾‾‾‾
1512   1551.25
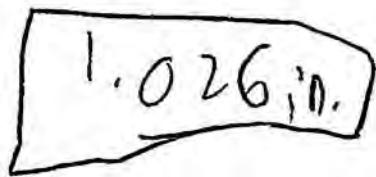
1.026 in.

Score 0: The student found both areas correctly, but showed no further correct work.

36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

Complete the frequency table below.

Heights of Students

Interval	Tally	Frequency
55–59	III	3
60–64	I I I I	4
65–69	HHT III	8
70–74	HHT	5

On the grid below, draw and label a frequency histogram for these data.

Score 3: The student has a complete and correct response.

36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

Complete the frequency table below.

Heights of Students

Interval	Tally	Frequency
55–59	|||	3
60–64	||||	4
65–69	|||| |||	8
70–74	||||	5

On the grid below, draw and label a frequency histogram for these data.
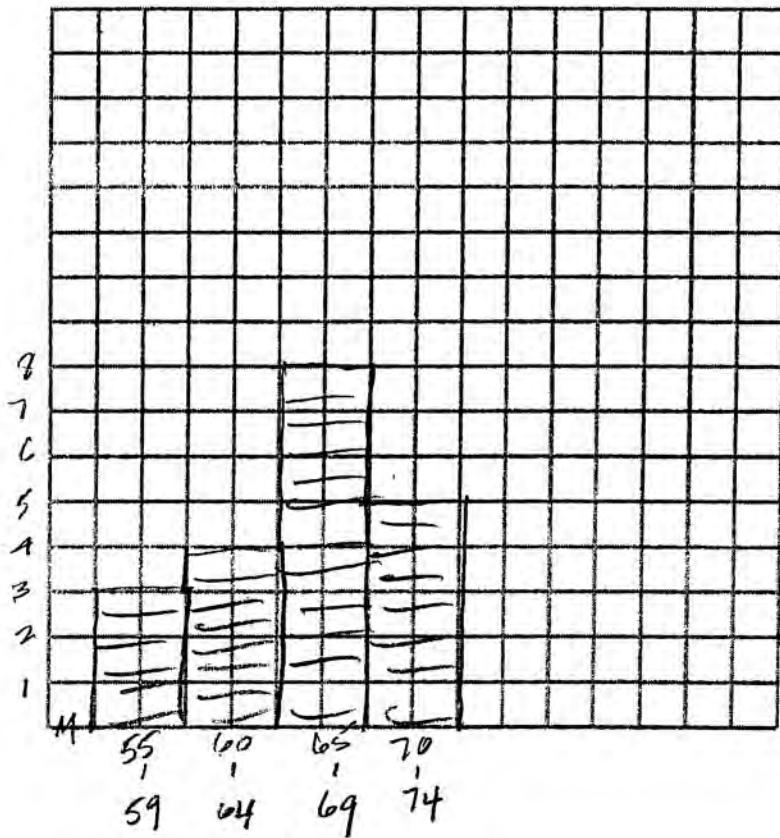
Score 2: The student completed the frequency table correctly and made an appropriate histogram, but did not label it.

36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

$$63, 56, 67, 59, 70, 69, 62, 74, 66, 72$$
$$67, 60, 70, 66, 67, 58, 68, 72, 63, 67$$

Complete the frequency table below.

Heights of Students

Interval	Tally	Frequency
55–59	|||	3
60–64	||||	4
65–69	⊬ ||	7
70–74	⊬ |	6

On the grid below, draw and label a frequency histogram for these data.
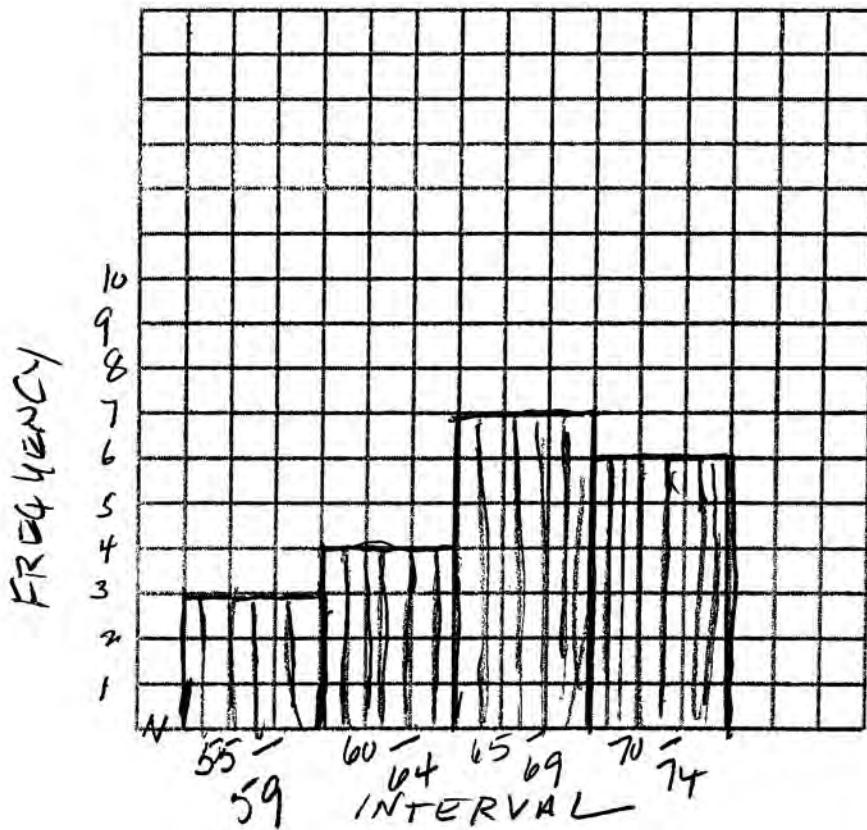
Score 2:   The student made an error in completing the frequency table. The student drew and labeled an appropriate histogram.

36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

$$63, 56, 67, 59, 70, 69, 62, 74, 66, 72$$
$$67, 60, 70, 66, 67, 58, 68, 72, 63, 67$$

Complete the frequency table below.

Heights of Students

Interval	Tally	Frequency
55–59	I I I	3
60–64	I I I I	4
65–69	I I I I I I I I	8
70–74	I I I I I	5

On the grid below, draw and label a frequency histogram for these data.
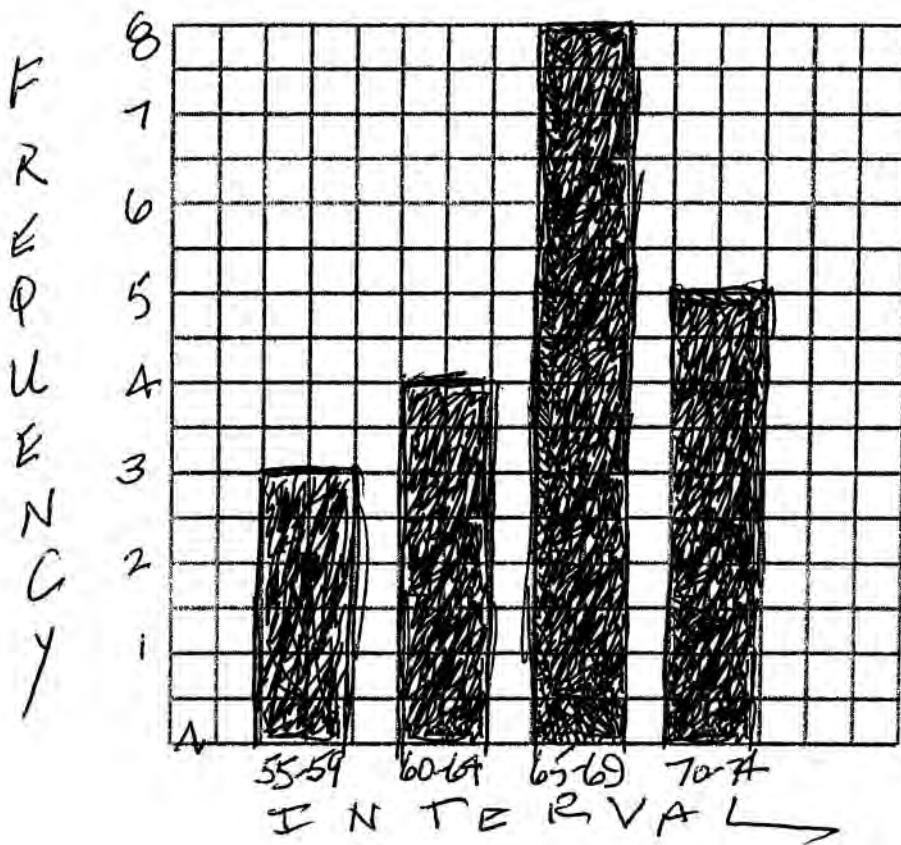
Score 1: The student completed the frequency table correctly, but made a conceptual error by drawing a bar graph.

36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

$$63, 56, 67, 59, 70, 69, 62, 74, 66, 72$$
$$67, 60, 70, 66, 67, 58, 68, 72, 63, 67$$

Complete the frequency table below.

Heights of Students

Interval	Tally	Frequency
55–59	///	3
60–64	////	4
65–69	HH ///	8
70–74	HH	5

On the grid below, draw and label a frequency histogram for these data.

Score 1: The student completed the frequency table correctly, but showed no further correct work.

36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

Complete the frequency table below.

Heights of Students

Interval	Tally	Frequency
55–59	|||	3
60–64	||||	4
65–69	||||||||	8
70–74	|||||	5

On the grid below, draw and label a frequency histogram for these data.

Score 1: The student completed the frequency table correctly. The student made both graphing and labeling errors when drawing the histogram.

36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

$$63, 56, 67, 59, 70, 69, 62, 74, 66, 72$$
$$67, 60, 70, 66, 67, 58, 68, 72, 63, 67$$

Complete the frequency table below.

Heights of Students

Interval	Tally	Frequency
55–59	⑴ ⑴	3
60–64	⑴⑴⑴	4
65–69	⑴⑴⑴⑴⑴ ⑴⑴⑴	7
70–74	⑴⑴⑴⑴⑴	5

On the grid below, draw and label a frequency histogram for these data.
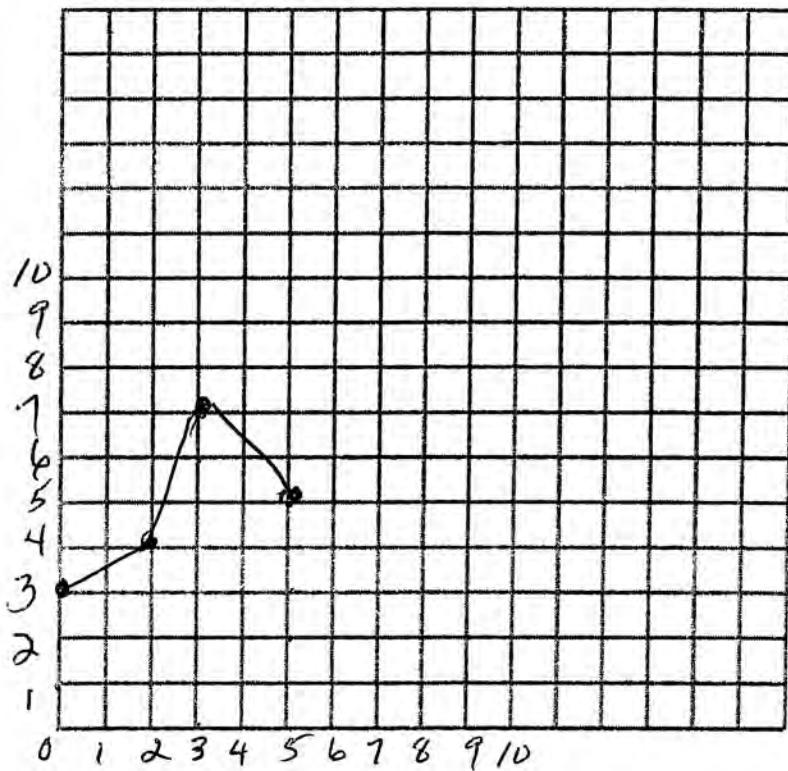
Score 0: The student made an error in completing the frequency table. The student drew a completely incorrect graph.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

$2(x^2 - 2x - 3) \to 2(x+1)(x-3)$

$2(x+1) = 0$ $2(x-3) = 0$ roots $= -1, 3$
$2x + 2 = 0$ $2x - 6 = 0$
$\quad -2 \ -2$ $\quad +6 \ +6$
$2x = -2$ $2x = 6$
$x = -1$ $x = 3$

1 box = 1 unit
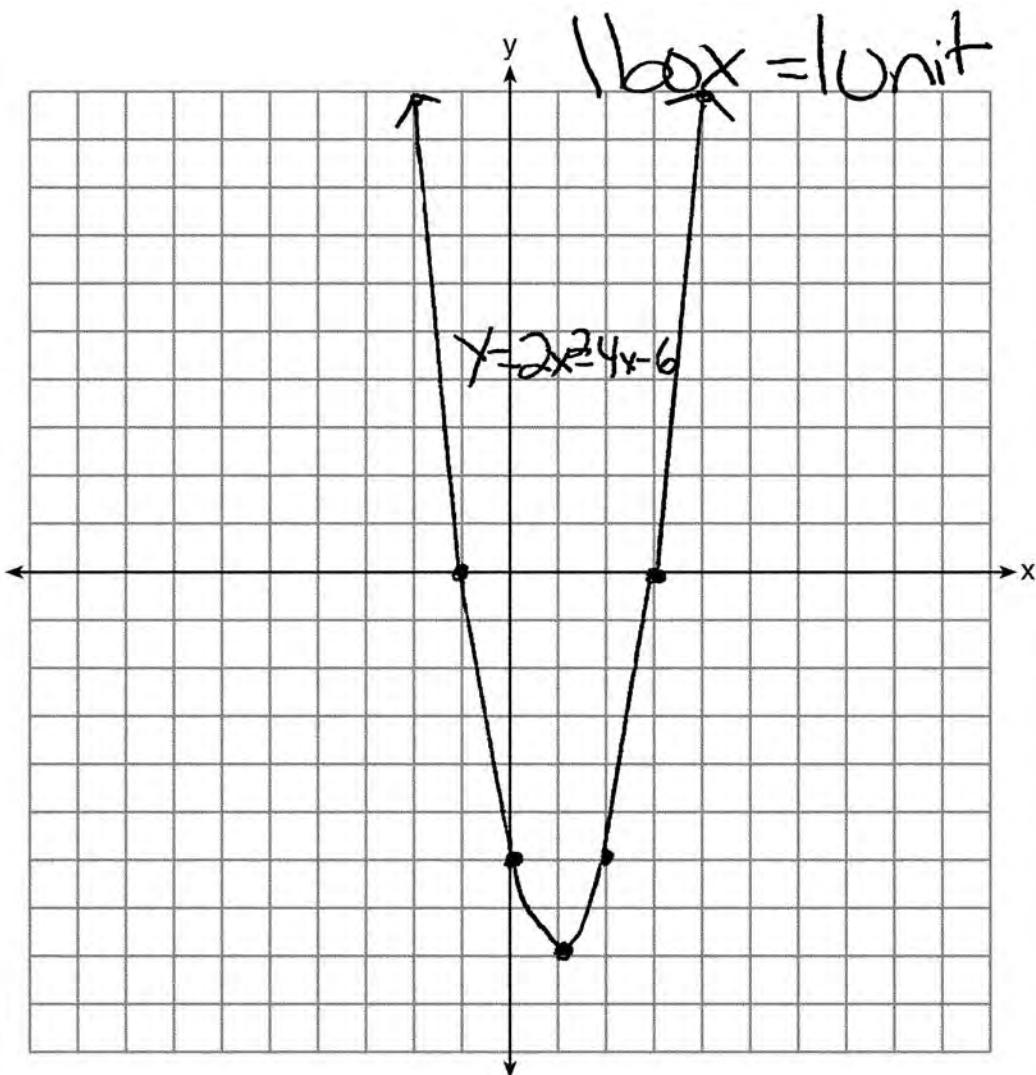
$y = 2x^2 - 4x - 6$

Score 4:   The student has complete and correct work.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

Score 4: The student showed complete and correct work.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

$$\left(x = -1 \quad x = 3 \right)$$

$$y = 2\left(x^2 - \overset{S}{2}x - \overset{P}{3}\right) \quad 3,1$$

$$(x+1)(x-3) \quad -3,1$$

$$x+1=0 \quad x-3=0$$
$$-1 \quad -1 \quad +3 \quad +3$$
$$x=-1 \quad x=3$$

$y = 2x^2 - 4x - 6$

**Score 4:** The student showed complete and correct work.

Question 37

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

Roots → $(-1,0)$ $(3,0)$
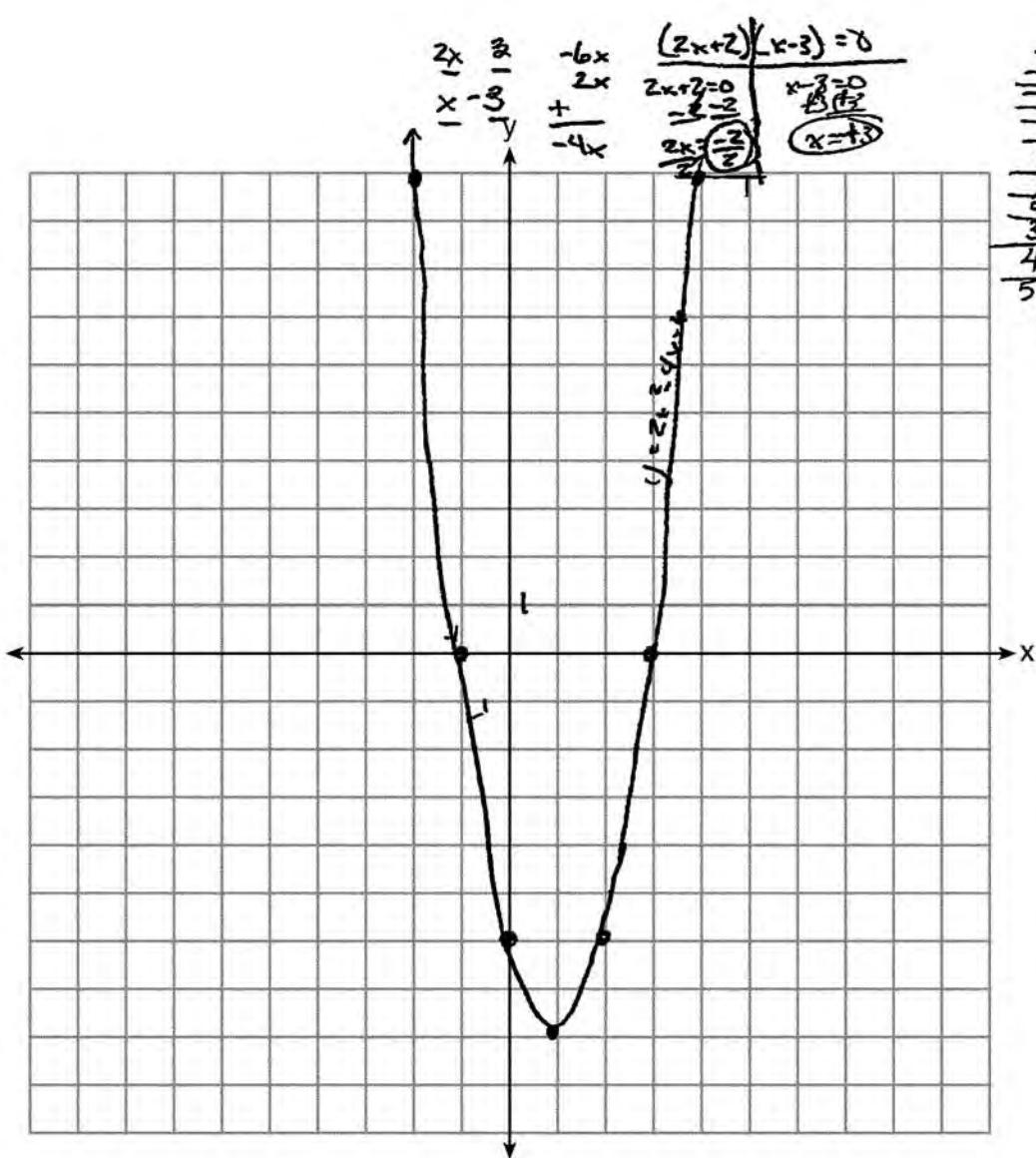
Score 3: The student drew a correct graph, but expressed the roots as coordinates.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

$$2(3)^2 - 4(3) - 6 = 0$$

$$\boxed{X = 3}$$
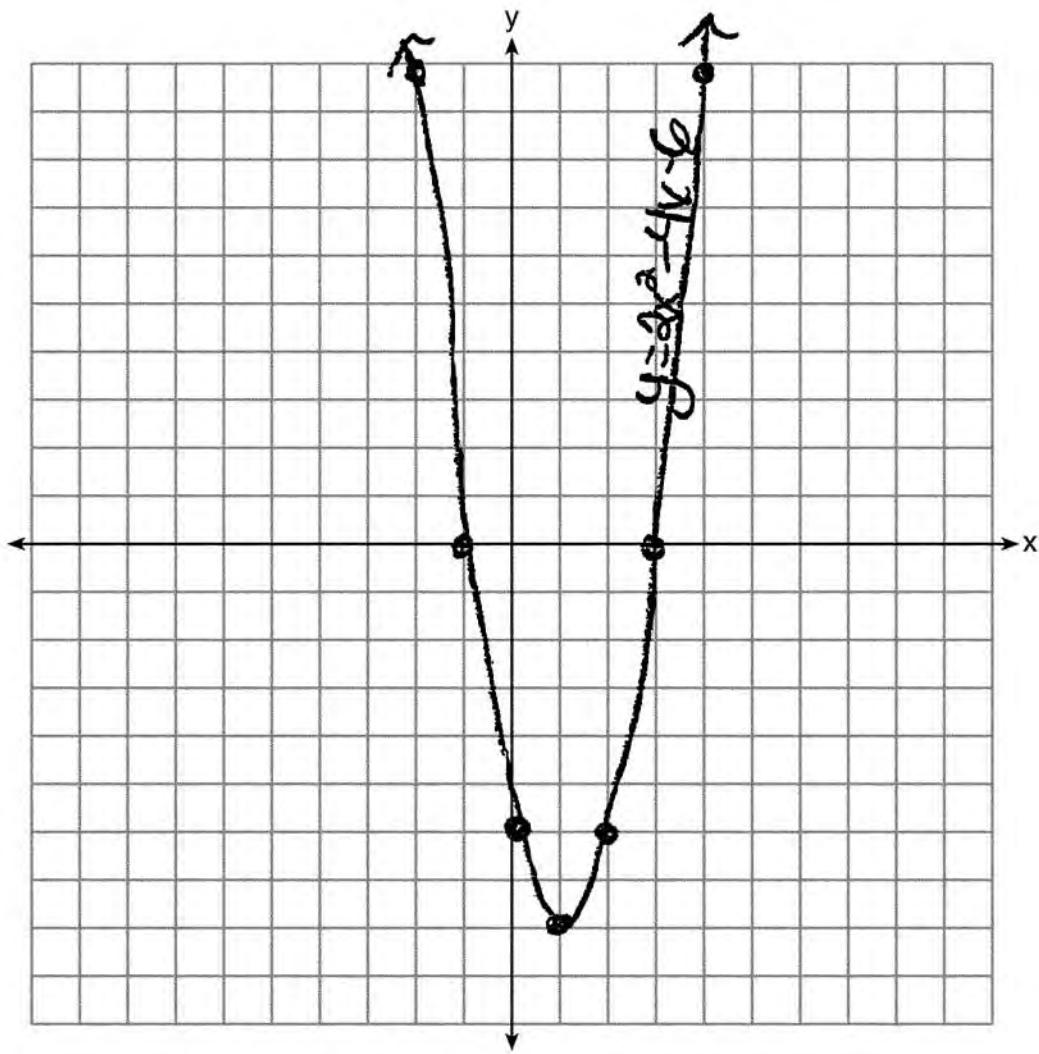
Score 3:   The student drew a correct graph, but stated only one root, 3.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

    State the roots of $0 = 2x^2 - 4x - 6$.

$$y = 2\frac{x^2}{x} - 4x - 6$$

-2	10
-1	0
0	-6
1	-8
2	-6
3	0
4	10

$X = -1 \qquad X = 3$
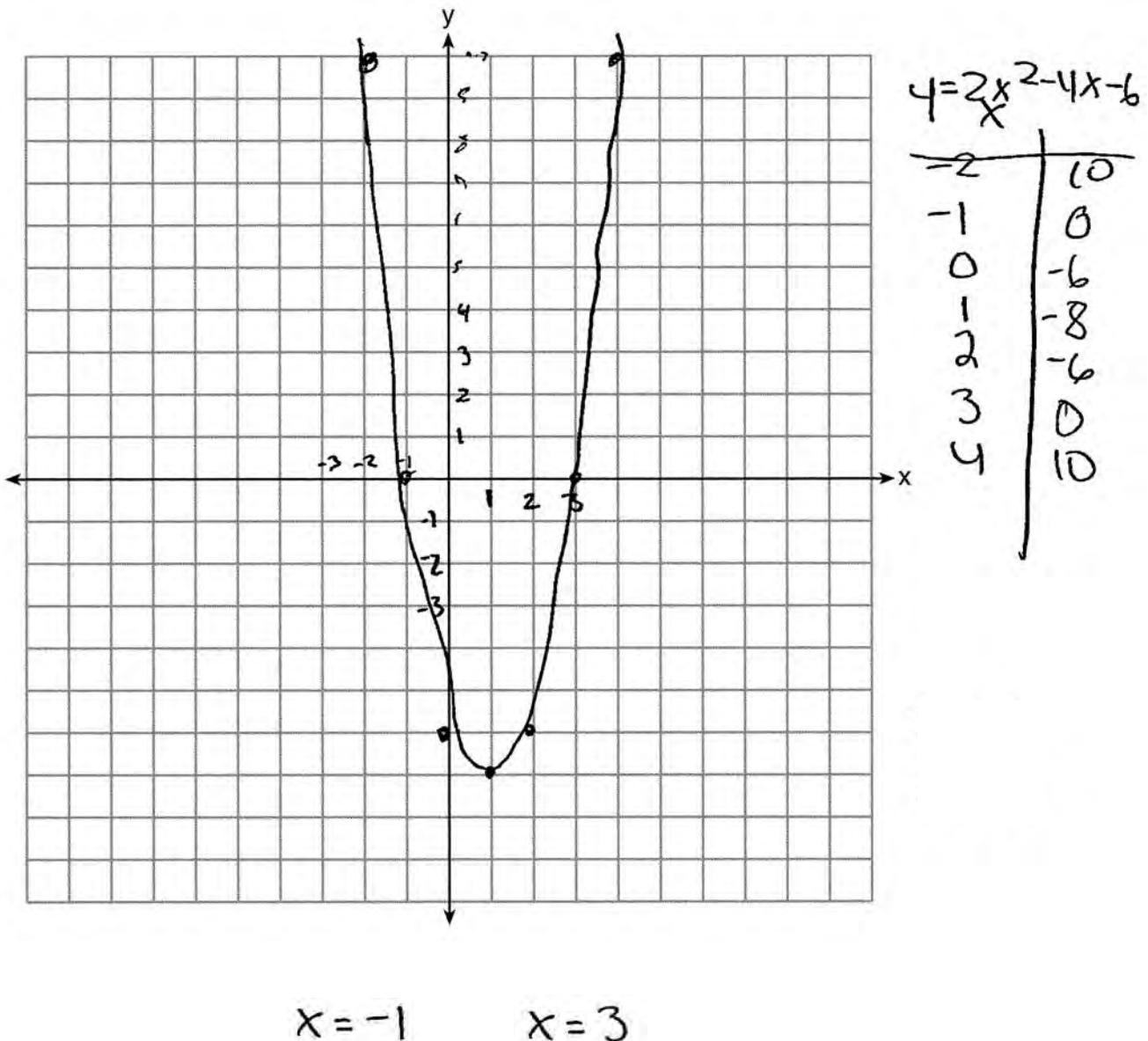
Score 3:   The student made one graphing error when plotting the vertex, but stated the correct roots.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

roots $(-1, 0)$

$(3, 0)$

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

$y = 2x^2 - 4x - 6$

$(-1, 0)$
$(0, -6)$

$(3, 0)$

$(1, -8)$
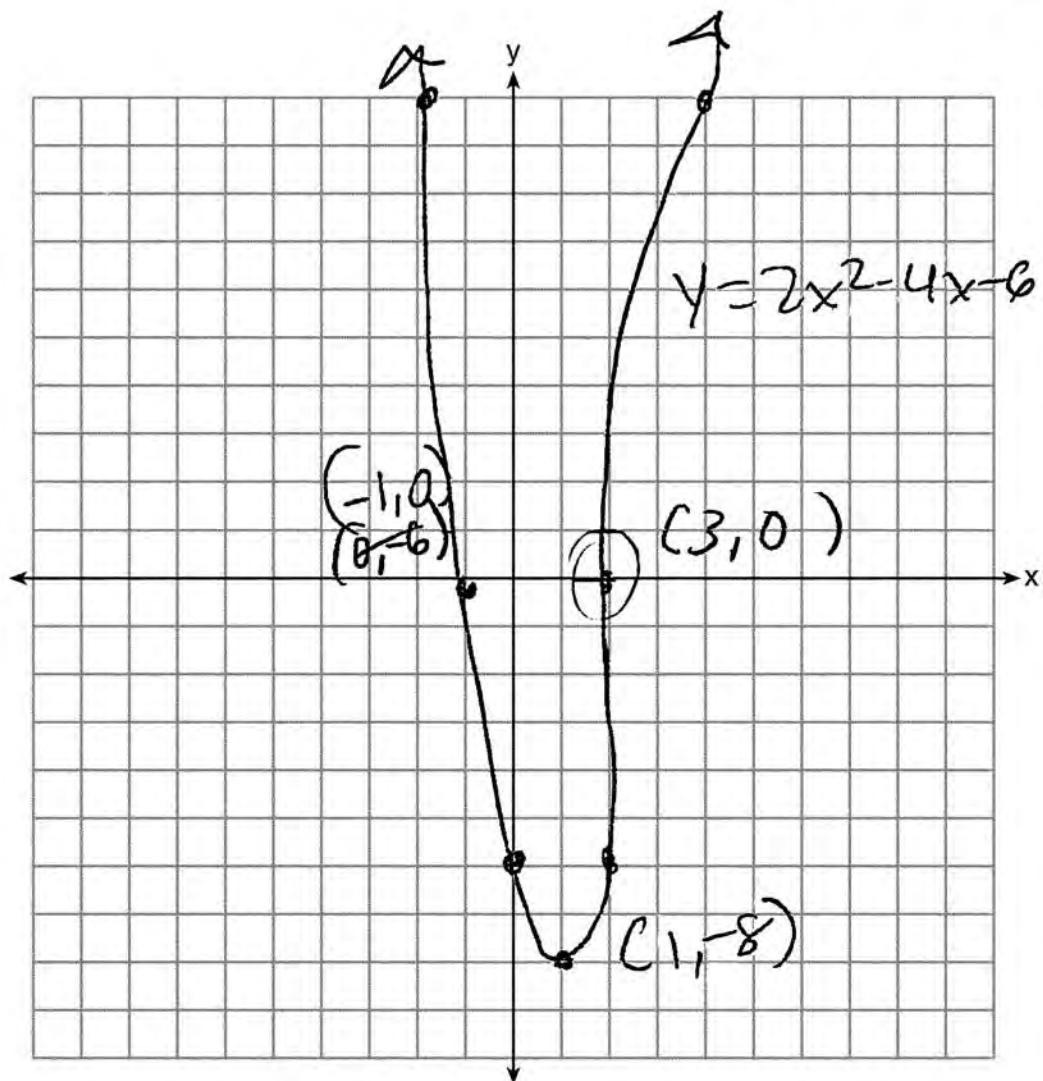
Score 2: The student made one graphing error and stated the roots as coordinates.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

$$X = -1 \text{ and } X = 3$$

$$2(x^2 - 2x - 3)$$
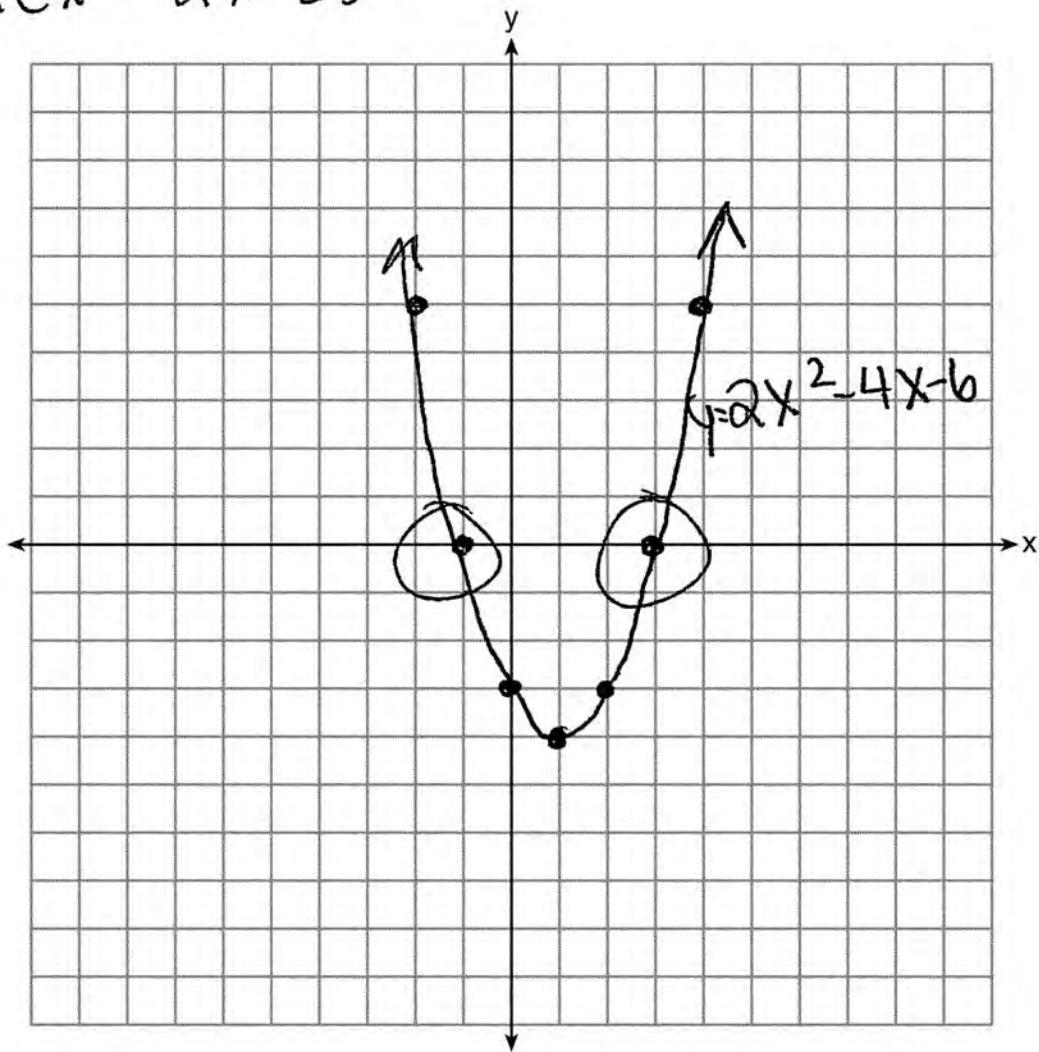
$y = 2x^2 - 4x - 6$

Score 2: The student made one conceptual error by factoring out a 2 and graphing $y = x^2 - 2x - 3$. The student stated the appropriate roots.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

$(-3, 1)$

$$2x^2 - 4x - 6 = 0$$
$$2(x^2 - 2x - 3) = 0$$
$$2(x - 3)(x + 1)$$

$y = 2x^2 - 4x - 6$

$y = 2 - 1, 8$

x	y
-2	10
-1	0
0	-6
1	-8
2	-6
3	0
4	10
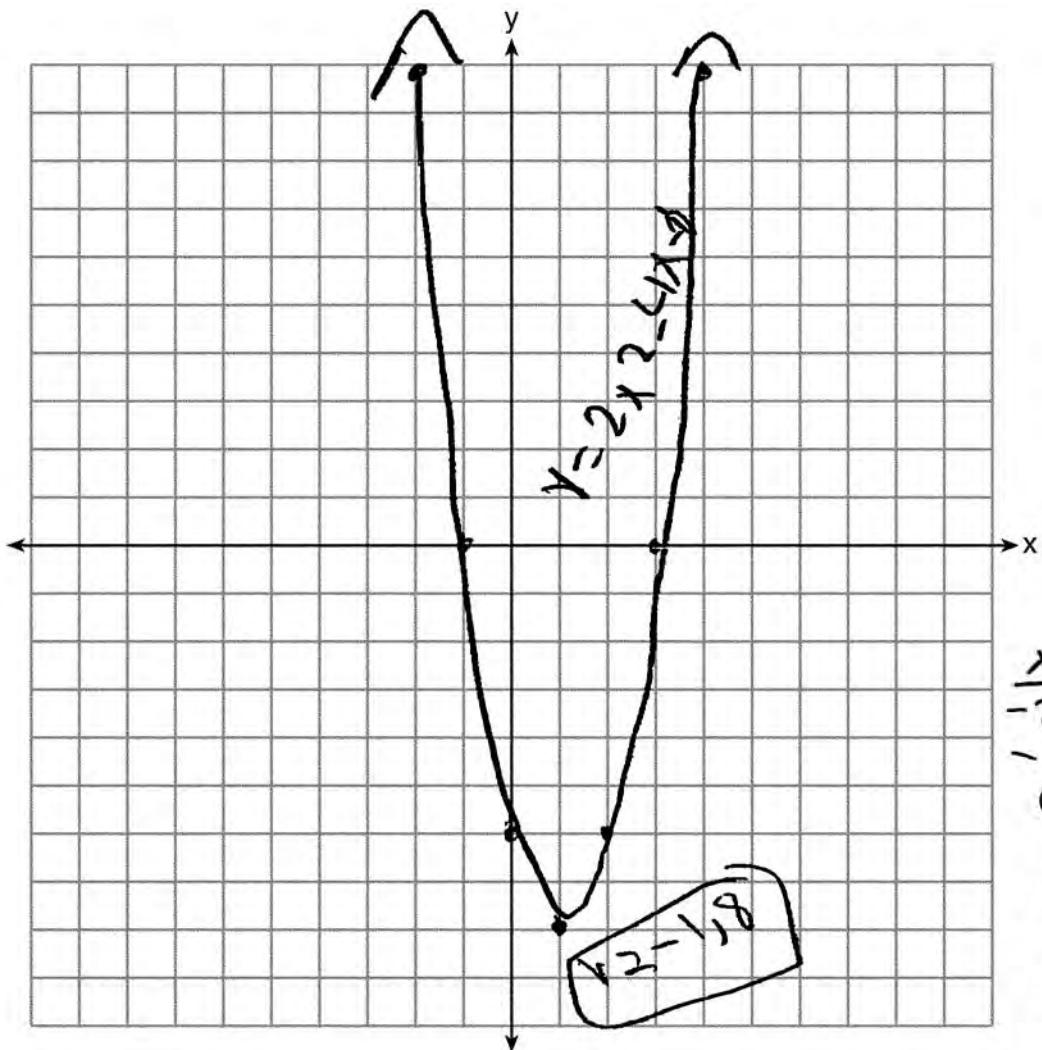
Score 2: The student drew a correct graph, but showed no further correct work.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

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

$x + 1 = 0$ $x - 3 = 0$
  -1 -1
   $x = -1$ $x = 3$

**Score 2:** The student showed appropriate work to find -1 and 3, but did not draw a graph.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

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

$x+1=0 \quad x-3=0$

$\quad -1 \;\; -1$

$\qquad x=-1 \quad x=3$

$\quad (-1,0) \quad (3,0)$

y

x

Score 1: The student showed appropriate work to find -1 and 3, but did not draw a graph and stated the roots as coordinates.

37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

$-1,0$

$3,0$
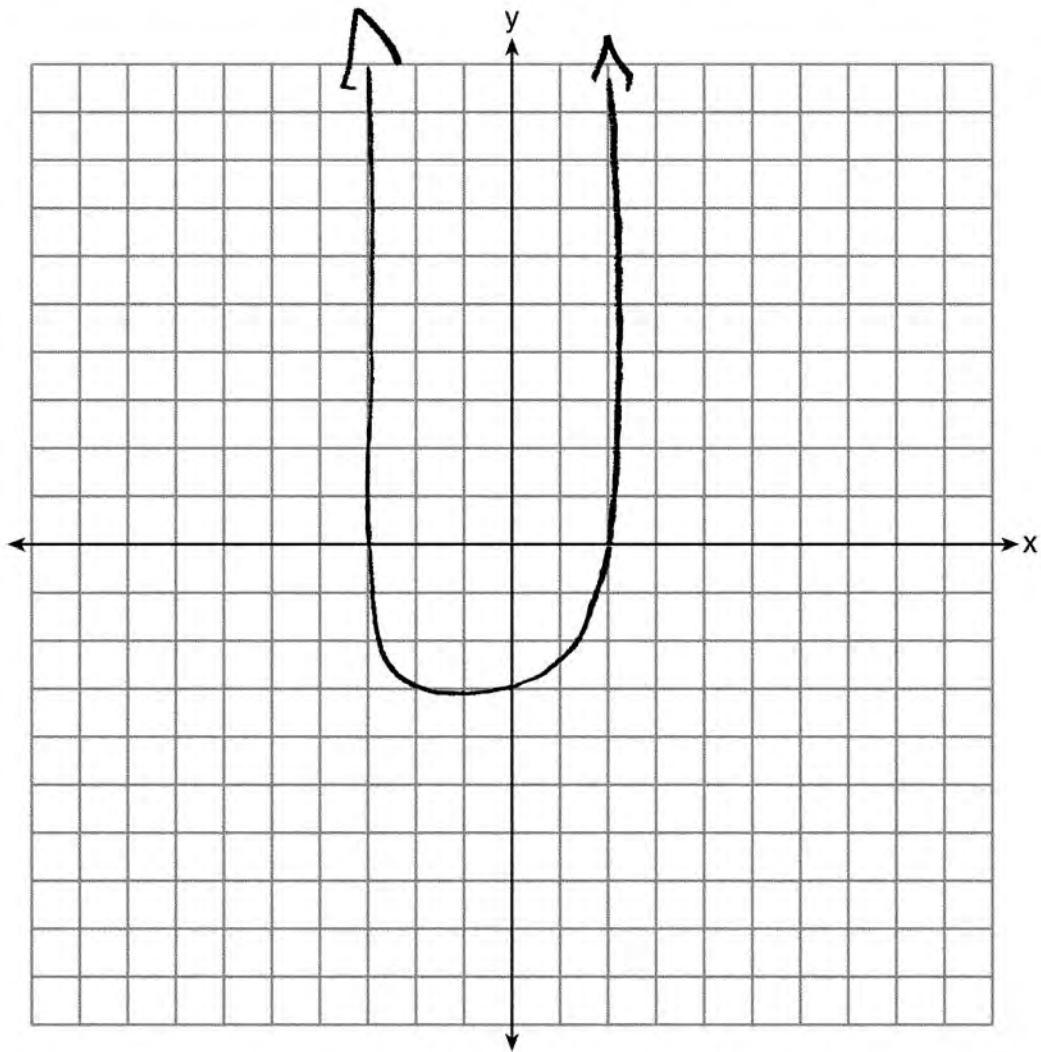
Score 0: The student stated $-1,0$ and $3,0$ and drew a completely incorrect graph.

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.
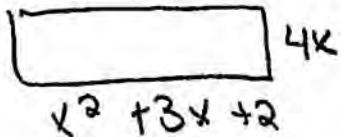
$P = S_1 + S_2 + S_3 + S_4$

$P = \underline{4x} + \underline{4x} \pm x^2 \not{+} 3x \pm 2 \pm x^2 + 3x + 2$

$P = 2x^2 + 14x + 4$

length $= x^2 + 3x + 2$

width $= 4x$

Express the area of the rectangle as a trinomial.

$a = l \cdot w$

$a = 4x(x^2 + 3x + 2)$

$a = 4x^3 + 12x^2 + 8x$

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

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.

$$x^2 + 3x + 2$$

$$4x \qquad\qquad 4x$$
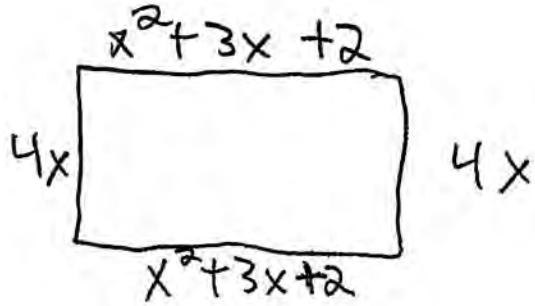
$$x^2 + 3x + 2$$

$$^2(x^2 + 3x + 2) \qquad 2(4x)$$

$$2x^2 + 3x + 4 + 8x = \boxed{2x^2 + 11x + 4} \quad \text{Perimeter}$$

Express the area of the rectangle as a trinomial.

$$4x \; (x^2 + 3x + 2) = 2$$

$$\boxed{4x^3 + 12x^2 + 8x}$$
$$\text{Area}$$

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

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.
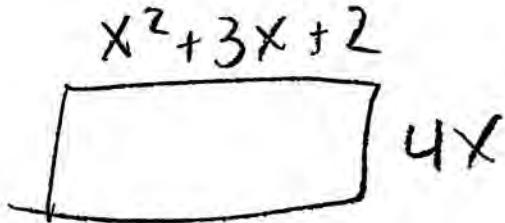
$$x^2 + 3x + 2$$

$$P = x^2 + 3x + 2 + 4x$$

$$P = x^2 + 7x + 2$$

Express the area of the rectangle as a trinomial.

$$A = b \cdot h$$

$$A = 4x(x^2 + 3x + 2)$$

$$A = 4x^3 + 12x^2 + 8x$$

Score 2: The student made a conceptual error when finding the perimeter.

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.
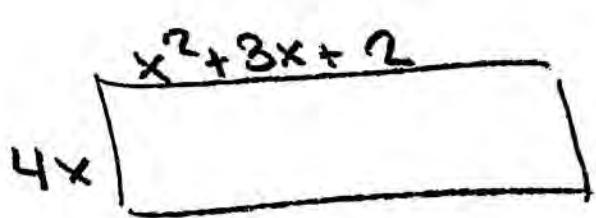
$$P = 2l + 2w$$
$$P = 2(x^2 + 3x + 2) + 2(4x)$$
$$P = 2x^2 + 6x + 4 + 8x$$
$$P = 2x^2 + 14x + 4$$

Express the area of the rectangle as a trinomial.

Score 2: The student only found the perimeter correctly.

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.

perimeter : $4x + x^2 + 3x + 2 + 4x + x^2 + 3x + 2 =$

$\boxed{2x^2 + 14x + 4}$

$4x$
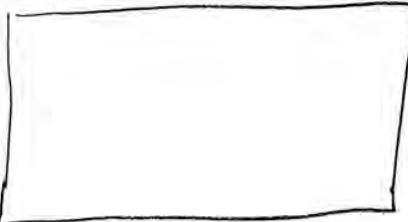
$x^2 + 3x + 2$

Express the area of the rectangle as a trinomial.

$4x \cdot x^2 + 3x + 2$

$4x^3 + 3x + 2$

Score 2: The student correctly found the perimeter, but made a conceptual error in finding the area.

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.

$$\boxed{2x^2 + 14 + 4}$$

$x^2 + 3x + 2$ $\quad \cancel{x^2}$ $\boxed{1x^4 + 9x + 4}$

$4x$ [rectangle] $4x$
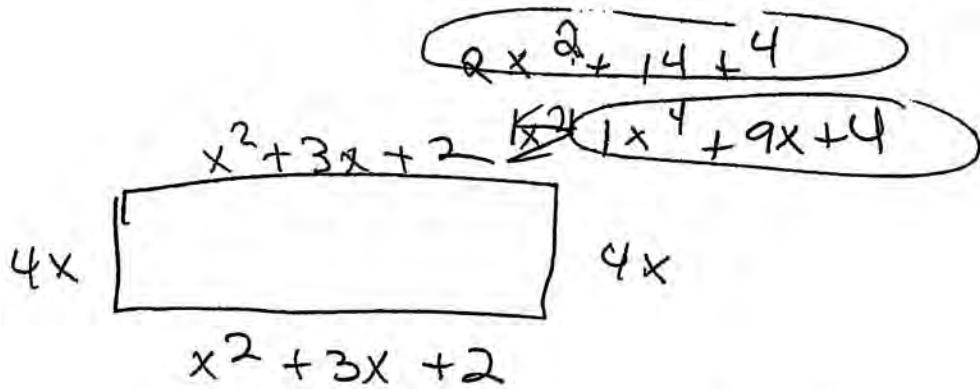
$x^2 + 3x + 2$

$(16x)$

$1x^2 + 3x + 2$

$1x^2 + 3x + 2$

$\overline{1x^4 + 9x + 4}$

$x^2 + 3x + 2$
$x^2 + 3x + 2$
$+ 4x$
$+ 4x$

$\overline{2x^2 + 14x + 4}$

Express the area of the rectangle as a trinomial.

Score 1: The student correctly calculated the perimeter, but transcribed the circled answer incorrectly (the x has been left out). The student calculated the area incorrectly.

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.
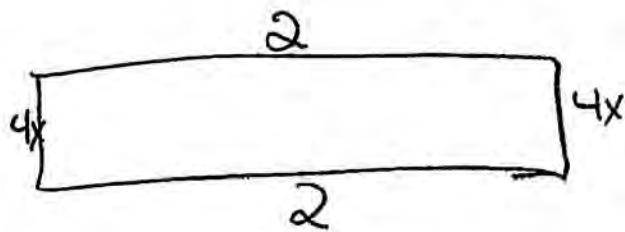
$$x^2 + 3x + 2 = 2$$

Perimeter $= 2 \cdot 2$

Express the area of the rectangle as a trinomial.

area $= 4x - 4x$

Score 0: The student showed no correct work.

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

$$\begin{array}{r} 2.10 \\ -.25 \\ \hline 1.85 \end{array}$$

$$.10(m-4) \le 1.85$$

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$m - 4 \le 18.5$$

$$m \le 22.5$$

$$\boxed{22}$$

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

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

$$.25 + .10(m-4) = 2.10$$
$$.25 + .10m - .40 \leq 2.10$$
$$.10m - .15 \leq 2.10$$
$$.10m \leq 2.25$$
$$m \leq 22.5$$

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$m \leq 22.5$$
$$m = 22$$

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

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

$$.25 + .10(m-4) \leq 2.10$$

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$.25 + .10m - .4 \leq 2.10$$
$$.10m - .15 \leq 2.10$$
$$.10m \leq 2.25$$
$$m \leq 22.5$$

Score 3: The student wrote the correct inequality and solved it to find $m \leq 22.5$. The student did not find the maximum number of whole minutes.

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

$$.25 + .10(m-4) \le 2.10$$

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$.25 + .10(m-4) \le 2.10$$

$$\frac{.10(m-4)}{.10} \le \frac{2.35}{.10}$$

$$m - 4 \le 23.5$$

$$m \le 27.5$$

$$m = 27$$

Score 3: The student wrote a correct inequality, but made one computational error in solving it. The student found an appropriate maximum number of minutes.

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has \$2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

$$.25(4) + .10x \leq 2.10$$

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$.25(4) + .10x \leq 2.10$$

$$1 + .10x \leq 2.10$$

$$\frac{.10x}{.10} \leq \frac{1.10}{.10}$$

$$x \leq 11$$

$$\boxed{11 \text{ min}}$$

Score 2: The student made a conceptual error in writing the inequality, but solved it appropriately to find the maximum number of minutes.

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

$$.25 + .10x \leq 2.10$$

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$-\ .25 + .10x \leq 2.10$$
$$.25 \qquad -\ .25$$
$$\frac{.10x}{.10} \leq \frac{1.85}{.10}$$
$$x \leq 18.5$$

$$\boxed{18 \text{ minutes}}$$

Score 2: The student made a conceptual error in writing the inequality, but solved it appropriately to find the maximum number of minutes.

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

$$.25m + .10 \le 2.10$$

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

.35 = 5 min   1.85 = 20
.45 = 6 min   1.95 = 21
.55 = 7 min   2.05 = 22
.65 = 8 min
.75 = 9 min | 22 minutes |
.85 = 10 min
.95 = 11 min
1.05 = 12 min
1.15 = 13 min
1.25 = 14 min
1.35 = 15 min
1.45 = 16 min
1.55 = 17 min
1.65 = 18 min
1.75 = 19 min

Score 2: The student used a method other than algebraic to find the 22 minutes.

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$\frac{2.10 - .25}{.10} + 4$$

$$m = 22.5 \, min$$

Score 1: The student did not write a correct inequality, but found $m = 22.5$, arithmatically. The student did not find the maximum number of whole minutes.

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find m, the maximum number of minutes that Tony can talk on the phone.

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

$$25 + 10x \geq 2.10$$
$$-25 \qquad\qquad -25$$
$$\frac{10x}{10} \geq \frac{1.85}{10}$$
$$x > 18$$

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

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

Regents Examination in Integrated Algebra – June 2015

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

Raw Score	Scale Score	Raw Score	Scale Score	Raw Score	Scale Score	Raw Score	Scale Score
87	100	65	84	43	75	21	52
86	99	64	84	42	75	20	50
85	98	63	84	41	74	19	49
84	97	62	83	40	73	18	47
83	96	61	83	39	73	17	45
82	95	60	83	38	72	16	43
81	94	59	82	37	71	15	41
80	93	58	82	36	70	14	39
79	92	57	81	35	69	13	37
78	92	56	81	34	68	12	35
77	91	55	81	33	67	11	32
76	90	54	80	32	66	10	30
75	90	53	80	31	65	9	27
74	89	52	80	30	64	8	25
73	88	51	79	29	63	7	22
72	88	50	79	28	62	6	19
71	87	49	78	27	61	5	17
70	87	48	78	26	59	4	14
69	86	47	77	25	58	3	10
68	86	46	77	24	57	2	7
67	86	45	76	23	55	1	4
66	85	44	76	22	54	0	0

To determine the student's final examination 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 Integrated Algebra.