The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA 2/TRIGONOMETRY

Tuesday, June 19, 2012 — 1:15 to 4:15 p.m., only

Student Name:_____

School Name: _____

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 39 questions. You must answer all questions in this examination. Write your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in Parts II, III, and IV directly in this booklet. All work should be written in pen, except graphs and drawings, which should be done in pencil. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc.

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

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

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

Notice…

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

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

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

Part I

Answer all 27 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the separate answer sheet the numeral preceding the word or expression that best completes the statement or answers the question. [54]

Use this space for computations.

1 What is the product of $\left(\frac{2}{5}x - \frac{3}{4}y^2\right)$ and $\left(\frac{2}{5}x + \frac{3}{4}y^2\right)$?

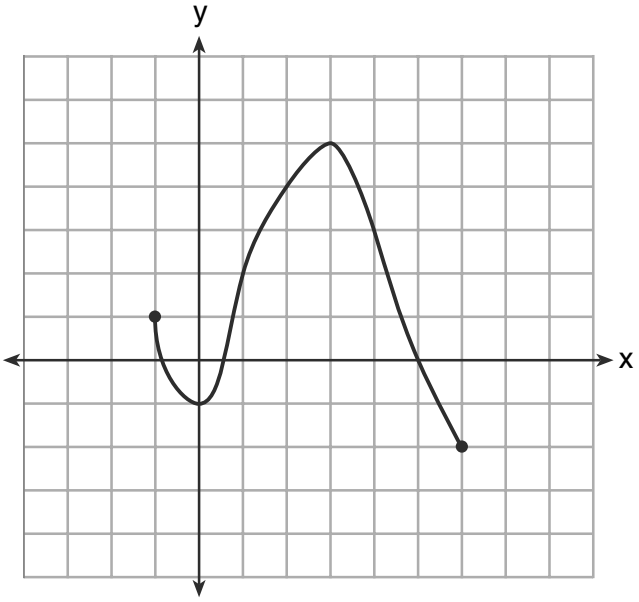
(1) $\frac{4}{25}x^2 - \frac{9}{16}y^4$

(2) $\frac{4}{25}x - \frac{9}{16}y^2$

(3) $\frac{2}{5}x^2 - \frac{3}{4}y^4$

(4) $\frac{4}{5}x$

2 What is the domain of the function shown below?



(1) $-1 \leq x \leq 6$

(2) $-1 \leq y \leq 6$

(3) $-2 \leq x \leq 5$

(4) $-2 \leq y \leq 5$

Use this space for computations.

3 What is the solution set for $2\cos\theta - 1 = 0$ in the interval $0° \leq \theta < 360°$?

(1) $\{30°, 150°\}$

(2) $\{60°, 120°\}$

(3) $\{30°, 330°\}$

(4) $\{60°, 300°\}$

4 The expression $\sqrt[3]{64a^{16}}$ is equivalent to

(1) $8a^4$

(2) $8a^8$

(3) $4a^5\sqrt[3]{a}$

(4) $4a\sqrt[3]{a^5}$

5 Which summation represents $5 + 7 + 9 + 11 + \ldots + 43$?

(1) $\sum_{n=5}^{43} n$

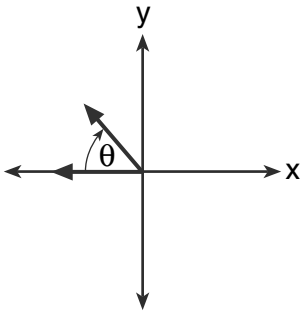
(2) $\sum_{n=1}^{20} (2n + 3)$

(3) $\sum_{n=4}^{24} (2n - 3)$

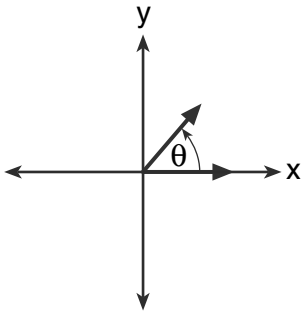
(4) $\sum_{n=3}^{23} (3n - 4)$

Use this space for computations.

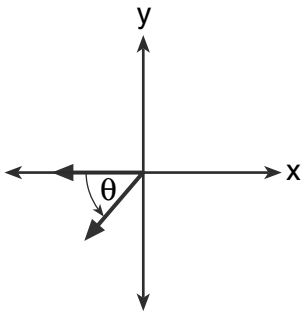
6 If $m\angle\theta = -50$, which diagram represents θ drawn in standard position?



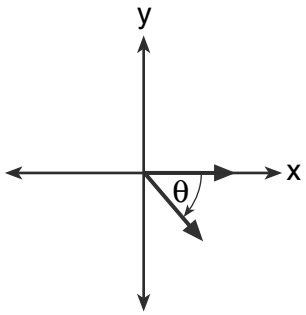
(1)



(3)



(2)



(4)

7 If $\log_b x = 3\log_b p - \left(2\log_b t + \frac{1}{2}\log_b r\right)$, then the value of x is

(1) $\frac{p^3}{\sqrt{t^2 r}}$

(2) $p^3 t^2 r^{\frac{1}{2}}$

(3) $\frac{p^3 t^2}{\sqrt{r}}$

(4) $\frac{p^3}{t^2\sqrt{r}}$

8 Which equation has roots with the sum equal to $\frac{9}{4}$ and the product equal to $\frac{3}{4}$?

(1) $4x^2 + 9x + 3 = 0$

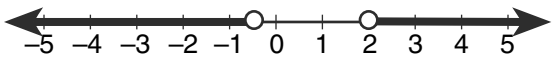
(2) $4x^2 + 9x - 3 = 0$

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

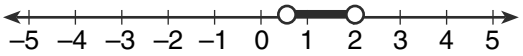
(4) $4x^2 - 9x - 3 = 0$

Use this space for computations.

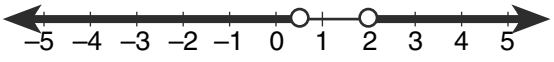
9 Which graph represents the solution set of $\left|\frac{4x-5}{3}\right| > 1$?



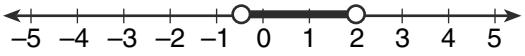
(1)



(2)



(3)



(4)

10 Which expression is equivalent to $\frac{x^{-1}y^4}{3x^{-5}y^{-1}}$?

(1) $\frac{x^4y^5}{3}$

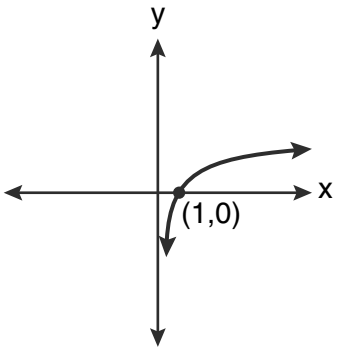
(2) $\frac{x^5y^4}{3}$

(3) $3x^4y^5$

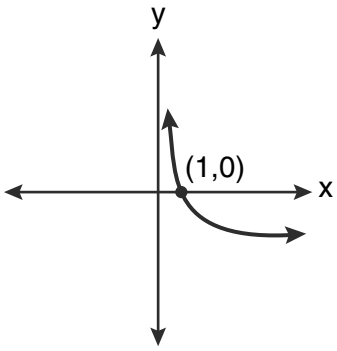
(4) $\frac{y^4}{3x^5}$

Use this space for computations.

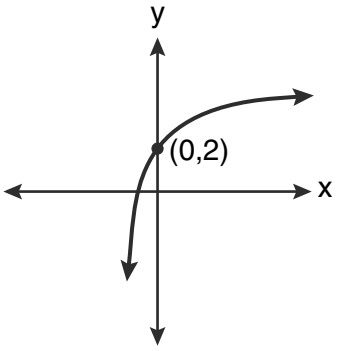
11 Which graph represents the function $\log_2 x = y$?



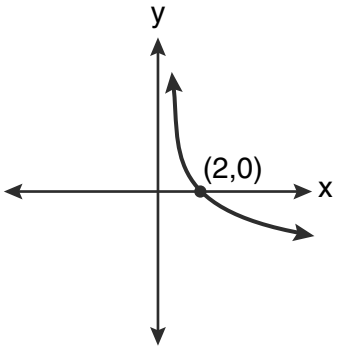
(1)



(3)



(2)



(4)

12 A circle is drawn to represent a pizza with a 12 inch diameter. The circle is cut into eight congruent pieces. What is the length of the outer edge of any one piece of this circle?

(1) $\frac{3\pi}{4}$

(2) π

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

(4) 3π

Use this space for computations.

13 What is the solution set for the equation $\sqrt{5x + 29} = x + 3$?

(1) $\{4\}$

(2) $\{-5\}$

(3) $\{4, 5\}$

(4) $\{-5, 4\}$

14 When factored completely, $x^3 + 3x^2 - 4x - 12$ equals

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

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

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

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

15 What is the middle term in the expansion of $\left(\frac{x}{2} - 2y\right)^6$?

(1) $20x^3y^3$

(2) $-\frac{15}{4}x^4y^2$

(3) $-20x^3y^3$

(4) $\frac{15}{4}x^4y^2$

Use this space for computations.

16 Which expression is equivalent to $(n \circ m \circ p)(x)$, given $m(x) = \sin x$, $n(x) = 3x$, and $p(x) = x^2$?

(1) $\sin(3x)^2$
(2) $3\sin x^2$
(3) $\sin^2(3x)$
(4) $3\sin^2 x$

17 The value of csc 138°23′ rounded to four decimal places is

(1) −1.3376
(2) −1.3408
(3) 1.5012
(4) 1.5057

18 Which function is one-to-one?

(1) $k(x) = x^2 + 2$
(2) $g(x) = x^3 + 2$
(3) $f(x) = |x| + 2$
(4) $j(x) = x^4 + 2$

19 The conjugate of the complex expression $-5x + 4i$ is

(1) $5x - 4i$
(2) $5x + 4i$
(3) $-5x - 4i$
(4) $-5x + 4i$

20 What is a positive value of $\tan \frac{1}{2}x$, when $\sin x = 0.8$?

(1) 0.5
(2) 0.4
(3) 0.33
(4) 0.25

Use this space for computations.

21 The table below displays the results of a survey regarding the number of pets each student in a class has. The average number of pets per student in this class is 2.

Number of Pets	0	1	2	3	4	5
Number of Students	4	6	10	0	k	2

What is the value of k for this table?

(1) 9
(2) 2
(3) 8
(4) 4

22 How many negative solutions to the equation $2x^3 - 4x^2 + 3x - 1 = 0$ exist?

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

23 A study finds that 80% of the local high school students text while doing homework. Ten students are selected at random from the local high school. Which expression would be part of the process used to determine the probability that, *at most*, 7 of the 10 students text while doing homework?

(1) ${}_{10}C_6\left(\frac{4}{5}\right)^6\left(\frac{1}{5}\right)^4$
(2) ${}_{10}C_7\left(\frac{4}{5}\right)^{10}\left(\frac{1}{5}\right)^7$
(3) ${}_{10}C_8\left(\frac{7}{10}\right)^{10}\left(\frac{3}{10}\right)^2$
(4) ${}_{10}C_9\left(\frac{7}{10}\right)^9\left(\frac{3}{10}\right)^1$

Use this space for computations.

24 In which interval of $f(x) = \cos(x)$ is the inverse also a function?

(1) $-\frac{\pi}{2} < x < \frac{\pi}{2}$

(2) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

(3) $0 \leq x \leq \pi$

(4) $\frac{\pi}{2} \leq x \leq \frac{3\pi}{2}$

25 As shown in the table below, a person's target heart rate during exercise changes as the person gets older.

Age (years)	**Target Heart Rate** (beats per minute)
20	135
25	132
30	129
35	125
40	122
45	119
50	115

Which value represents the linear correlation coefficient, rounded to the *nearest thousandth*, between a person's age, in years, and that person's target heart rate, in beats per minute?

(1) -0.999

(2) -0.664

(3) 0.998

(4) 1.503

Use this space for computations.

26 In $\triangle MNP$, $m = 6$ and $n = 10$. Two distinct triangles can be constructed if the measure of angle M is

(1) 35
(2) 40
(3) 45
(4) 50

27 If order does *not* matter, which selection of students would produce the most possible committees?

(1) 5 out of 15
(2) 5 out of 25
(3) 20 out of 25
(4) 15 out of 25

Part II

Answer all 8 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

28 Determine the value of n in simplest form:

$$i^{13} + i^{18} + i^{31} + n = 0$$

29 The formula for continuously compounded interest is $A = Pe^{rt}$, where A is the amount of money in the account, P is the initial investment, r is the interest rate, and t is the time in years.

Using the formula, determine, to the *nearest dollar*, the amount in the account after 8 years if \$750 is invested at an annual rate of 3%.

30 Express $\cos\theta(\sec\theta - \cos\theta)$, in terms of $\sin\theta$.

31 A cup of soup is left on a countertop to cool. The table below gives the temperatures, in degrees Fahrenheit, of the soup recorded over a 10-minute period.

Time in Minutes (x)	0	2	4	6	8	10
Temperature in °F (y)	180.2	165.8	146.3	135.4	127.7	110.5

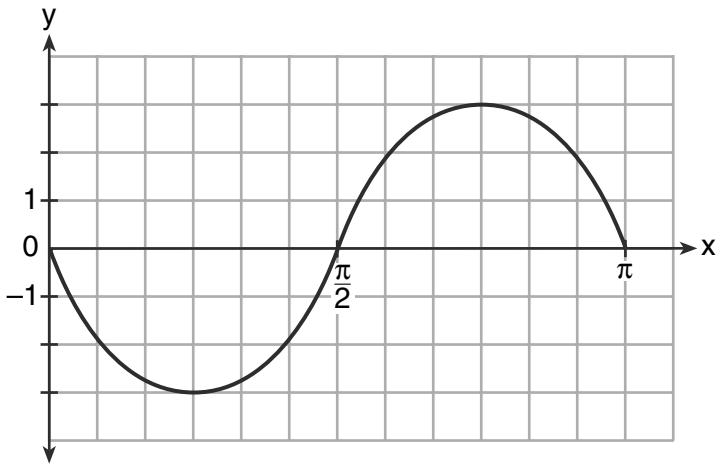
Write an exponential regression equation for the data, rounding all values to the *nearest thousandth.*

32 Find, to the *nearest tenth,* the radian measure of 216°.

33 Find the third term in the recursive sequence $a_{k+1} = 2a_k - 1$, where $a_1 = 3$.

34 The two sides and included angle of a parallelogram are 18, 22, and 60°. Find its exact area in simplest form.

35 Write an equation for the graph of the trigonometric function shown below.



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. 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]

36 Express in simplest form: $\dfrac{\dfrac{4 - x^2}{x^2 + 7x + 12}}{\dfrac{2x - 4}{x + 3}}$

37 During a particular month, a local company surveyed all its employees to determine their travel times to work, in minutes. The data for all 15 employees are shown below.

25	55	40	65	29
45	59	35	25	37
52	30	8	40	55

Determine the number of employees whose travel time is within one standard deviation of the mean.

38 The measures of the angles between the resultant and two applied forces are 60° and 45°, and the magnitude of the resultant is 27 pounds. Find, to the *nearest pound*, the magnitude of each applied force.

Part IV

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. A correct numerical answer with no work shown will receive only 1 credit. The answer should be written in pen. [6]

39 Solve algebraically for all values of x:

$$81^{x^3+2x^2} = 27^{\frac{5x}{3}}$$

Tear Here

Reference Sheet

Area of a Triangle

$$K = \frac{1}{2}ab \sin C$$

Functions of the Sum of Two Angles

$$\sin (A + B) = \sin A \cos B + \cos A \sin B$$
$$\cos (A + B) = \cos A \cos B - \sin A \sin B$$
$$\tan (A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

Functions of the Difference of Two Angles

$$\sin (A - B) = \sin A \cos B - \cos A \sin B$$
$$\cos (A - B) = \cos A \cos B + \sin A \sin B$$
$$\tan (A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

Law of Sines

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Sum of a Finite Arithmetic Series

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

Binomial Theorem

$$(a + b)^n = {}_nC_0a^nb^0 + {}_nC_1a^{n-1}b^1 + {}_nC_2a^{n-2}b^2 + \ldots + {}_nC_na^0b^n$$
$$(a + b)^n = \sum_{r=0}^{n} {}_nC_r a^{n-r}b^r$$

Law of Cosines

$$a^2 = b^2 + c^2 - 2bc \cos A$$

Functions of the Double Angle

$$\sin 2A = 2 \sin A \cos A$$
$$\cos 2A = \cos^2 A - \sin^2 A$$
$$\cos 2A = 2 \cos^2 A - 1$$
$$\cos 2A = 1 - 2 \sin^2 A$$
$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

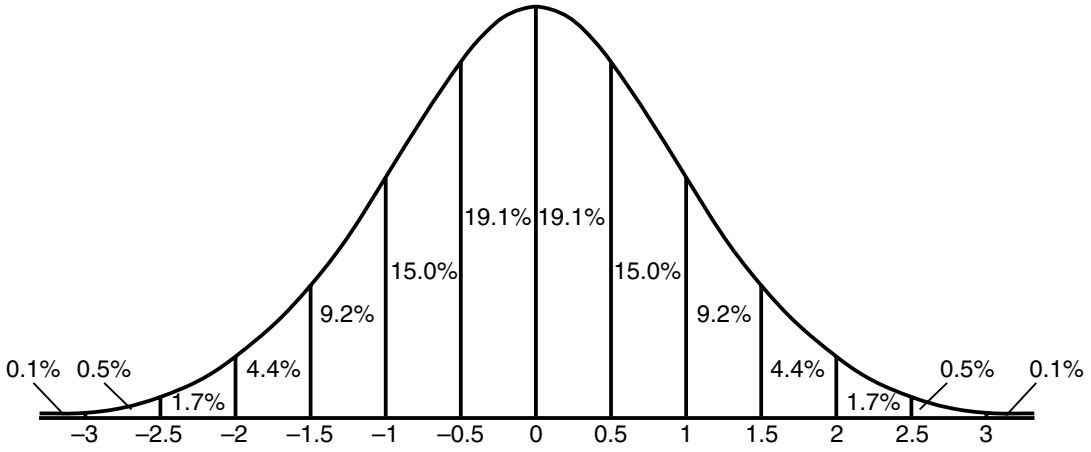
Functions of the Half Angle

$$\sin \frac{1}{2}A = \pm\sqrt{\frac{1 - \cos A}{2}}$$
$$\cos \frac{1}{2}A = \pm\sqrt{\frac{1 + \cos A}{2}}$$
$$\tan \frac{1}{2}A = \pm\sqrt{\frac{1 - \cos A}{1 + \cos A}}$$

Sum of a Finite Geometric Series

$$S_n = \frac{a_1(1 - r^n)}{1 - r}$$

Normal Curve
Standard Deviation



Tear Here

Tear Here

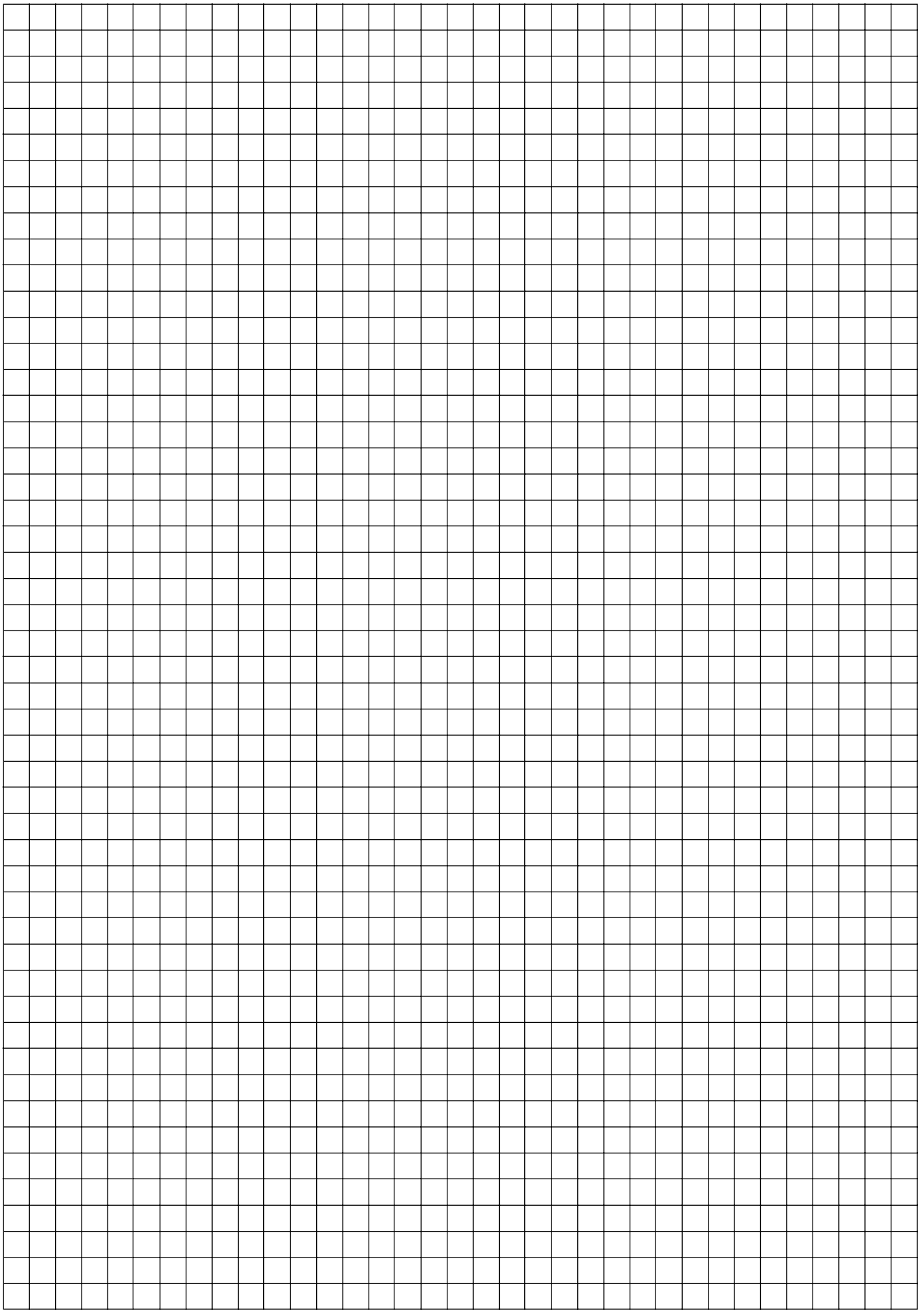
Tear Here

Tear Here

Tear Here

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

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



Tear Here

Tear Here

ALGEBRA 2/TRIGONOMETRY

FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA 2/TRIGONOMETRY

Tuesday, June 19, 2012 — 1:15 to 4:15 p.m., only

SCORING KEY AND RATING GUIDE

Mechanics of Rating

The following procedures are to be followed for scoring student answer papers for the Regents Examination in Algebra 2/Trigonometry. 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. 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 stray marks on the answer sheet that might later interfere with the accuracy of the scanning.

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. 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/apda/ on Tuesday, June 19, 2012. 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.

Part I

Allow a total of 54 credits, 2 credits for each of the following. Allow credit if the student has written the correct answer instead of the numeral 1, 2, 3, or 4.

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

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

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examination in Algebra 2/Trigonometry 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 otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(28) **[2]** 1, and appropriate work is shown.

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

or

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

or

[1] Appropriate work is shown, but the answer is not expressed in simplest form.

or

[1] 1, but no work is shown.

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

(29) **[2]** 953, and appropriate work is shown.

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

or

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

or

[1] 953, but no work is shown.

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

(30) **[2]** $\sin^2\theta$, and appropriate work is shown.

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

or

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

or

[1] $\cos\theta\sec\theta - \cos^2\theta$ or $\cos\theta\left(\frac{1}{\cos\theta} - \cos\theta\right)$ or $1 - \cos^2\theta$ is written, but no further correct work is shown.

or

[1] $\sin^2\theta$, but no work is shown.

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

(31) **[2]** $y = 180.377(0.954)^x$

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

or

[1] Appropriate work is shown, but one conceptual error is made, such as using the wrong regression equation.

or

[1] The expression $180.377(0.954)^x$ is written.

or

[1] An incorrect exponential regression equation is written.

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

(32) **[2]** 3.8, and appropriate work is shown.

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

or

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

or

[1] Appropriate work is shown to find 1.2π, but no further correct work is shown.

or

[1] 3.8, 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.

(33) **[2]** 9, and appropriate 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] 9, 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.

(34) **[2]** $198\sqrt{3}$, and appropriate work is shown.

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

or

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

or

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

or

[1] Appropriate work is shown to find 396 sin 60, but no further correct work is shown.

or

[1] $198\sqrt{3}$, but no work is shown.

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

(35) **[2]** $y = -3 \sin 2x$, or an equivalent equation is written.

[1] One computational error is made, but an appropriate equation is written.

or

[1] One conceptual error is made, but an appropriate equation is written.

or

[1] Amplitude = 3 and frequency = 2 are found.

or

[1] The expression $-3 \sin 2x$ is written.

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

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.

(36) **[4]** $-\frac{(x+2)}{2(x+4)}$ or $\frac{-x-2}{2x+8}$ or an equivalent simplified answer, and appropriate work is shown.

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

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

or

[2] Appropriate work is shown, but one conceptual error is made, such as not factoring out the -1.

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

or

[1] $-\frac{(x+2)}{2(x+4)}$, but no work is shown.

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

(37) **[4]** 8, and appropriate work is shown.

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

or

[3] $25.1 < x < 54.9$ or an equivalent expression is written, but no further correct work is shown.

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

or

[2] Appropriate work is shown, but one conceptual error is made, such as using 15.4, the sample standard deviation.

or

[2] $\sigma = 14.9$, but no further correct work is shown.

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

or

[1] 8, but no work is shown.

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

(38) **[4]** 24 and 20, and appropriate work is shown.

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

or

[3] Appropriate work is shown to find either 24 or 20, but no further correct work is shown.

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

or

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

or

[2] A correct substitution is made into the Law of Sines, but no further correct work is shown.

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

or

[1] A correctly labeled diagram is drawn, but no further correct work is shown.

or

[1] 24 and 20, but no work is shown.

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

Part IV

For 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.

(39) **[6]** $-\frac{5}{2}$, 0, and $\frac{1}{2}$, and appropriate algebraic work is shown.

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

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

or

[4] Appropriate work is shown to find $x(2x + 5)(2x - 1) = 0$, but no further correct work is shown.

or

[4] Appropriate work is shown to find $x = 0$, and a correct substitution is made into the quadratic formula, but no further correct work is shown.

[3] Appropriate work is shown, but three or more computational or factoring errors are made.

or

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

or

[3] Appropriate work is shown to find $x\left(4x^2 + 8x - 5\right) = 0$, but no further correct work is shown.

or

[3] $-\frac{5}{2}$, 0, and $\frac{1}{2}$, but a method other than algebraic is used.

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

or

[2] Appropriate work is shown to find $4x^3 + 8x^2 = 5x$ or an equivalent equation, but no further correct work is shown.

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

or

[1] $3^{4(x^3 + 2x^2)} = 3^{3\left(\frac{5x}{3}\right)}$ is written, but no further correct work is shown.

or

[1] $-\frac{5}{2}$, 0, and $\frac{1}{2}$, 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	1, 19, 28
Algebra	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 13, 14, 15, 16, 17, 18, 20, 22, 24, 26, 29, 30, 33, 34, 35, 36, 38, 39
Measurement	32
Statistics and Probability	21, 23, 25, 27, 31, 37

Regents Examination in Algebra 2/Trigonometry
June 2012
Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the June 2012 Regents Examination in Algebra 2/Trigonometry* will be posted on the Department's web site at: http://www.p12.nysed.gov/apda/ on Tuesday, June 19, 2012. Conversion charts provided for previous administrations of the Algebra 2/Trigonometry examination 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.