The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Thursday, August 16, 2012 — 8:30 to 11:30 a.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 38 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 for 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, a straightedge (ruler), and a compass 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.

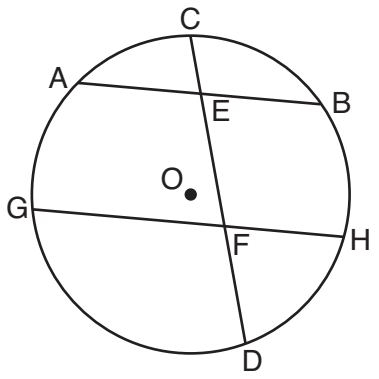
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer all 28 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Record your answers on your separate answer sheet. [56]

Use this space for computations.

1 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{GH}$. Chord $\overline{CD}$ intersects $\overline{AB}$ at E and $\overline{GH}$ at F.



Which statement must always be true?

(1) $\overset{\frown}{AC} \cong \overset{\frown}{CB}$

(2) $\overset{\frown}{DH} \cong \overset{\frown}{BH}$

(3) $\overset{\frown}{AB} \cong \overset{\frown}{GH}$

(4) $\overset{\frown}{AG} \cong \overset{\frown}{BH}$

2 The vertices of parallelogram $ABCD$ are $A(2,0)$, $B(0,-3)$, $C(3,-3)$, and $D(5,0)$. If $ABCD$ is reflected over the x-axis, how many vertices remain invariant?

(1) 1

(2) 2

(3) 3

(4) 0

3 Point M is the midpoint of $\overline{AB}$. If the coordinates of A are $(-3,6)$ and the coordinates of M are $(-5,2)$, what are the coordinates of B?

(1) $(1,2)$

(2) $(7,10)$

(3) $(-4,4)$

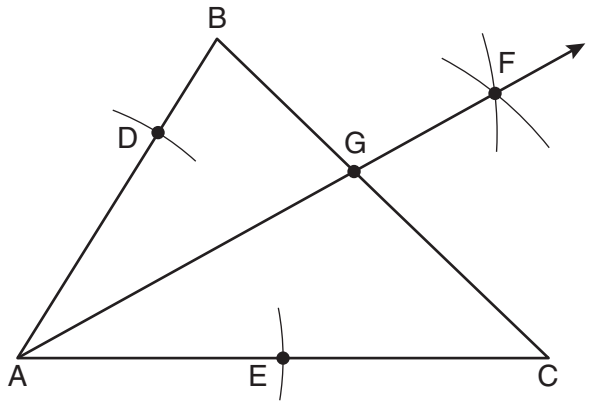
(4) $(-7,-2)$

Use this space for computations.

4 When a dilation is performed on a hexagon, which property of the hexagon will *not* be preserved in its image?

(1) parallelism
(2) orientation
(3) length of sides
(4) measure of angles

5 As shown in the diagram below of $\triangle ABC$, a compass is used to find points D and E, equidistant from point A. Next, the compass is used to find point F, equidistant from points D and E. Finally, a straightedge is used to draw $\overleftrightarrow{AF}$. Then, point G, the intersection of $\overleftrightarrow{AF}$ and side $\overline{BC}$ of $\triangle ABC$, is labeled.

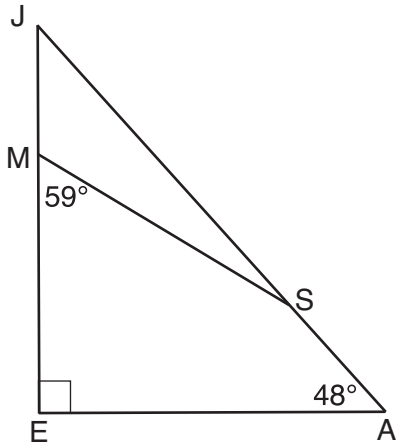


Which statement must be true?

(1) $\overleftrightarrow{AF}$ bisects side $\overline{BC}$
(2) $\overleftrightarrow{AF}$ bisects $\angle BAC$
(3) $\overleftrightarrow{AF} \perp \overline{BC}$
(4) $\triangle ABG \sim \triangle ACG$

Use this space for computations.

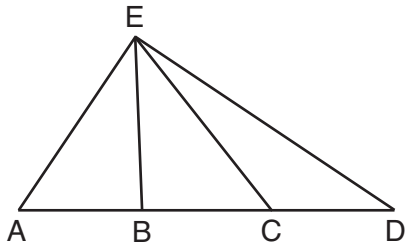
6 In the diagram of $\triangle JEA$ below, $m\angle JEA = 90$ and $m\angle EAJ = 48$. Line segment MS connects points M and S on the triangle, such that $m\angle EMS = 59$.



What is $m\angle JSM$?

(1) 163
(2) 121
(3) 42
(4) 17

7 In $\triangle AED$ with $\overline{ABCD}$ shown in the diagram below, $\overline{EB}$ and $\overline{EC}$ are drawn.

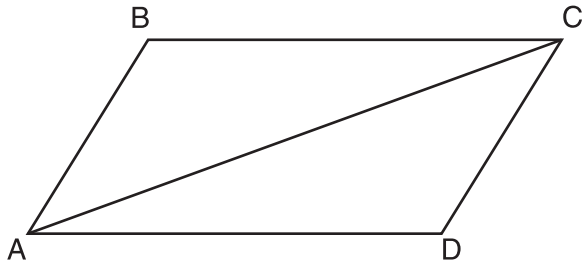


If $\overline{AB} \cong \overline{CD}$, which statement could always be proven?

(1) $\overline{AC} \cong \overline{DB}$
(2) $\overline{AE} \cong \overline{ED}$
(3) $\overline{AB} \cong \overline{BC}$
(4) $\overline{EC} \cong \overline{EA}$

Use this space for computations.

8 Given that $ABCD$ is a parallelogram, a student wrote the proof below to show that a pair of its opposite angles are congruent.



Statement	Reason
1. ABCD is a parallelogram.	1. Given
2. $\overline{BC} \cong \overline{AD}$ $\overline{AB} \cong \overline{DC}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Postulate of Congruency
4. $\triangle ABC \cong \triangle CDA$	4. Side-Side-Side
5. $\angle B \cong \angle D$	5. _____

What is the reason justifying that $\angle B \cong \angle D$?

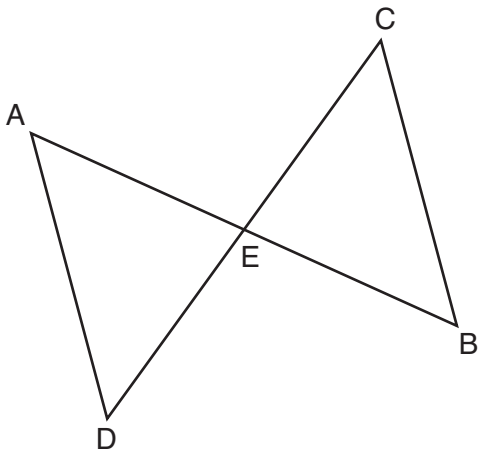
(1) Opposite angles in a quadrilateral are congruent.
(2) Parallel lines have congruent corresponding angles.
(3) Corresponding parts of congruent triangles are congruent.
(4) Alternate interior angles in congruent triangles are congruent.

9 The equation of a circle with its center at $(-3,5)$ and a radius of 4 is

(1) $(x + 3)^2 + (y - 5)^2 = 4$
(2) $(x - 3)^2 + (y + 5)^2 = 4$
(3) $(x + 3)^2 + (y - 5)^2 = 16$
(4) $(x - 3)^2 + (y + 5)^2 = 16$

Use this space for computations.

10 In the diagram below of $\triangle DAE$ and $\triangle BCE$, $\overline{AB}$ and $\overline{CD}$ intersect at E, such that $\overline{AE} \cong \overline{CE}$ and $\angle BCE \cong \angle DAE$.



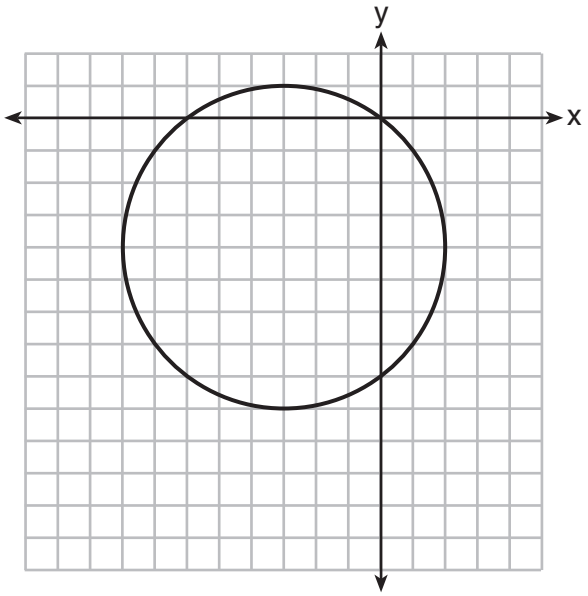
Triangle DAE can be proved congruent to triangle BCE by

(1) ASA
(2) SAS
(3) SSS
(4) HL

11 This question has been omitted.

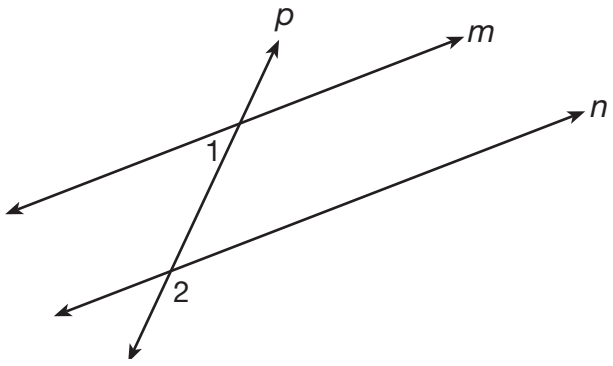
Use this space for computations.

12 What is an equation of the circle shown in the graph below?



(1) $(x - 3)^2 + (y - 4)^2 = 25$
(2) $(x + 3)^2 + (y + 4)^2 = 25$
(3) $(x - 3)^2 + (y - 4)^2 = 10$
(4) $(x + 3)^2 + (y + 4)^2 = 10$

13 As shown in the diagram below, lines m and n are cut by transversal p.



If $m\angle 1 = 4x + 14$ and $m\angle 2 = 8x + 10$, lines m and n are parallel when x equals

(1) 1
(2) 6
(3) 13
(4) 17

Use this space for computations.

14 The angle formed by the radius of a circle and a tangent to that circle has a measure of

(1) 45°
(2) 90°
(3) 135°
(4) 180°

15 A sphere is inscribed inside a cube with edges of 6 cm. In cubic centimeters, what is the volume of the sphere, in terms of π?

(1) 12π
(2) 36π
(3) 48π
(4) 288π

16 Scalene triangle ABC is similar to triangle DEF. Which statement is *false*?

(1) $AB : BC = DE : EF$
(2) $AC : DF = BC : EF$
(3) $\angle ACB \cong \angle DFE$
(4) $\angle ABC \cong \angle EDF$

17 Which equation represents a line that is parallel to the line whose equation is $y = \frac{3}{2}x - 3$ and passes through the point (1,2)?

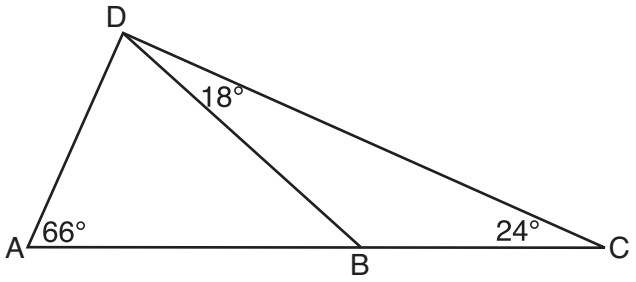
(1) $y = \frac{3}{2}x + \frac{1}{2}$
(2) $y = \frac{2}{3}x + \frac{4}{3}$
(3) $y = \frac{3}{2}x - 2$
(4) $y = -\frac{2}{3}x + \frac{8}{3}$

18 Lines a and b intersect at point P. Line c passes through P and is perpendicular to the plane containing lines a and b. Which statement must be true?

(1) Lines a, b, and c are coplanar.
(2) Line a is perpendicular to line b.
(3) Line c is perpendicular to both line a and line b.
(4) Line c is perpendicular to line a or line b, but not both.

Use this space for computations.

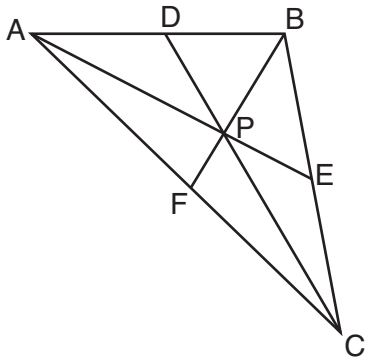
19 As shown in the diagram of $\triangle ACD$ below, B is a point on $\overline{AC}$ and $\overline{DB}$ is drawn.



If $m\angle A = 66$, $m\angle CDB = 18$, and $m\angle C = 24$, what is the longest side of $\triangle ABD$?

(1) $\overline{AB}$
(2) $\overline{DC}$
(3) $\overline{AD}$
(4) $\overline{BD}$

20 In $\triangle ABC$ shown below, P is the centroid and $BF = 18$.

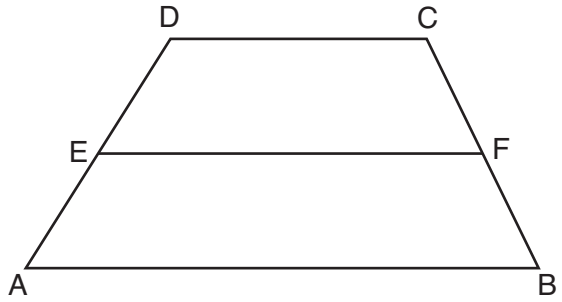


What is the length of $\overline{BP}$?

(1) 6
(2) 9
(3) 3
(4) 12

Use this space for computations.

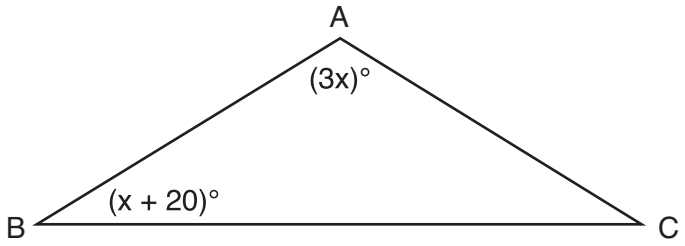
21 In the diagram below, $\overline{EF}$ is the median of trapezoid $ABCD$.



If $AB = 5x - 9$, $DC = x + 3$, and $EF = 2x + 2$, what is the value of x?

(1) 5
(2) 2
(3) 7
(4) 8

22 In the diagram below of $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $m\angle A = 3x$, and $m\angle B = x + 20$.



What is the value of x?

(1) 10
(2) 28
(3) 32
(4) 40

23 For which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?

(1) hexagon
(2) pentagon
(3) quadrilateral
(4) triangle

Use this space for computations.

24 For a triangle, which two points of concurrence could be located outside the triangle?

(1) incenter and centroid

(2) centroid and orthocenter

(3) incenter and circumcenter

(4) circumcenter and orthocenter

25 The slope of line ℓ is $-\frac{1}{3}$. What is an equation of a line that is perpendicular to line ℓ?

(1) $y + 2 = \frac{1}{3}x$

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

(3) $9x - 3y = 27$

(4) $3x + y = 0$

26 Which type of triangle can be drawn using the points $(-2,3)$, $(-2,-7)$, and $(4,-5)$?

(1) scalene

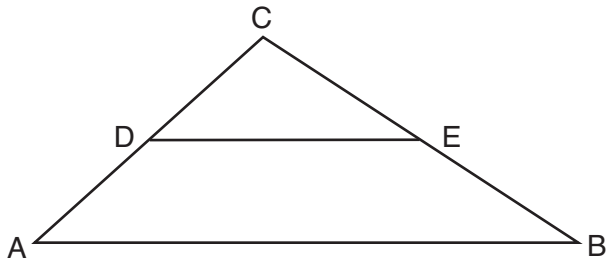
(2) isosceles

(3) equilateral

(4) no triangle can be drawn

Use this space for computations.

27 In the diagram below, $\overline{DE}$ joins the midpoints of two sides of $\triangle ABC$.



Which statement is *not* true?

(1) $CE = \frac{1}{2}CB$

(2) $DE = \frac{1}{2}AB$

(3) area of $\triangle CDE = \frac{1}{2}$ area of $\triangle CAB$

(4) perimeter of $\triangle CDE = \frac{1}{2}$ perimeter of $\triangle CAB$

28 Which equation represents the line that is perpendicular to $2y = x + 2$ and passes through the point (4,3)?

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

(2) $y = \frac{1}{2}x + 1$

(3) $y = -2x + 11$

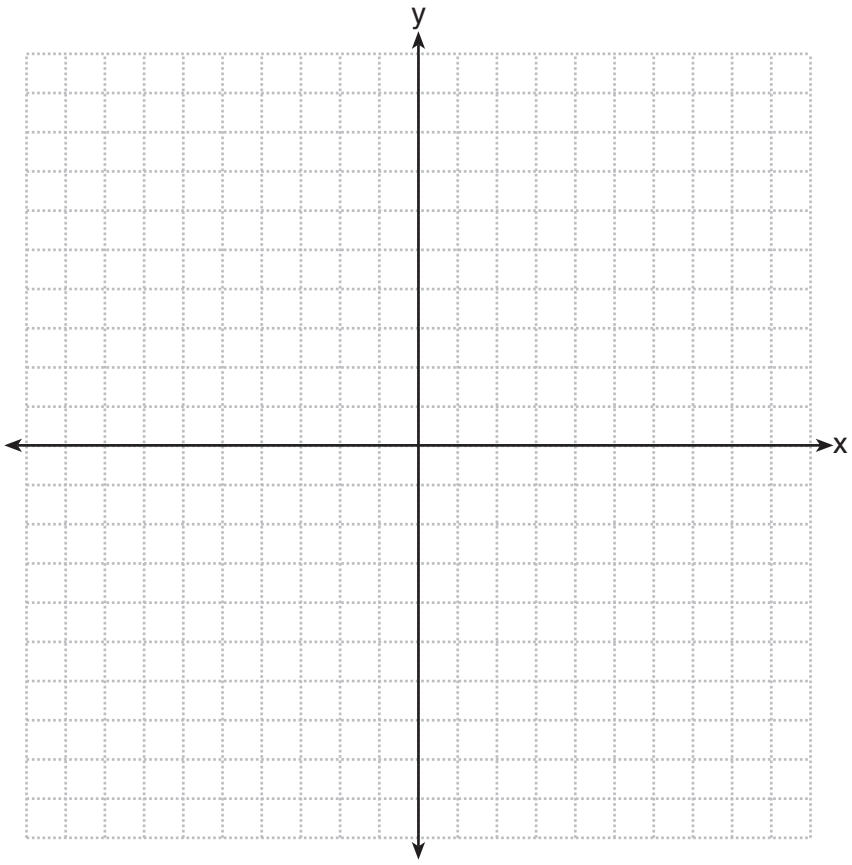
(4) $y = -2x - 5$

Part II

Answer all 6 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. [12]

29 Write the negation of the statement "2 is a prime number," and determine the truth value of the negation.

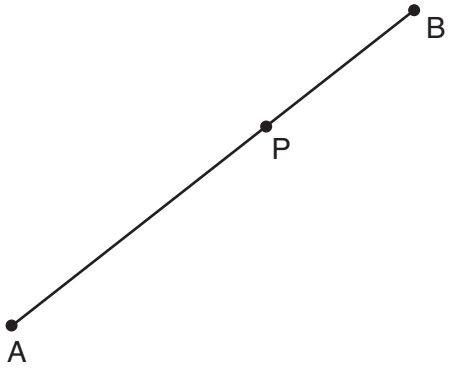
30 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-4,3)$, and $C(-3,-5)$. State the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a rotation of 90° about the origin.
[The use of the set of axes below is optional.]



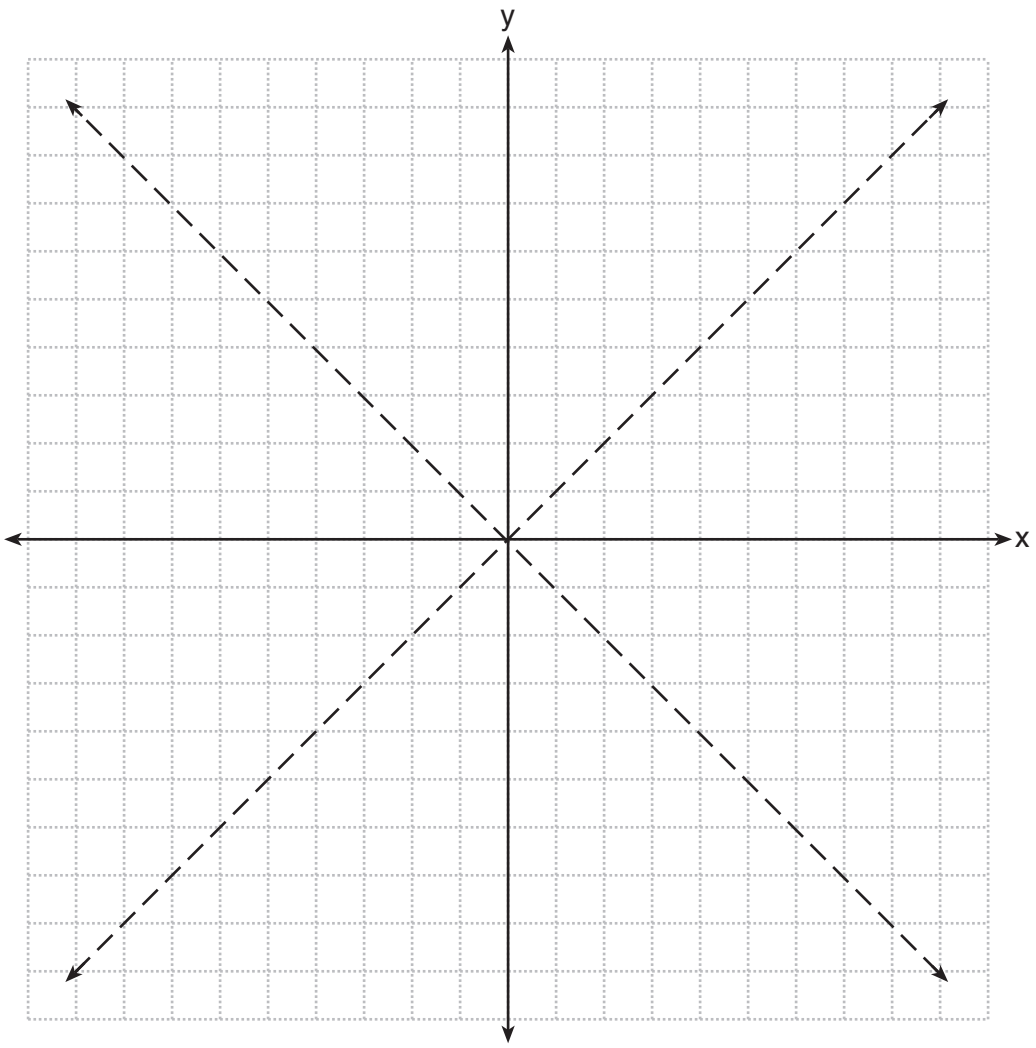
31 A cylinder has a height of 7 cm and a base with a diameter of 10 cm. Determine the volume, in cubic centimeters, of the cylinder in terms of π.

32 The coordinates of the endpoints of $\overline{FG}$ are $(-4,3)$ and $(2,5)$. Find the length of $\overline{FG}$ in simplest radical form.

33 Using a compass and straightedge, construct a line perpendicular to $\overline{AB}$ through point P. [Leave all construction marks.]



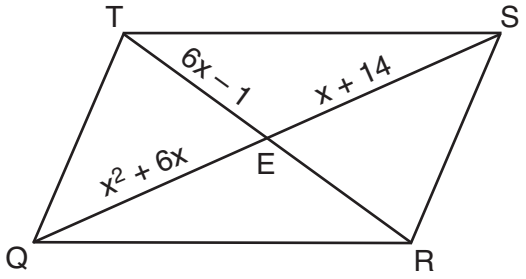
34 The graph below shows the locus of points equidistant from the x-axis and y-axis. On the same set of axes, graph the locus of points 3 units from the line $x = 0$. Label with an **X** *all* points that satisfy both conditions.



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]

35 As shown in the diagram below, the diagonals of parallelogram $QRST$ intersect at E. If $QE = x^2 + 6x$, $SE = x + 14$, and $TE = 6x - 1$, determine TE algebraically.

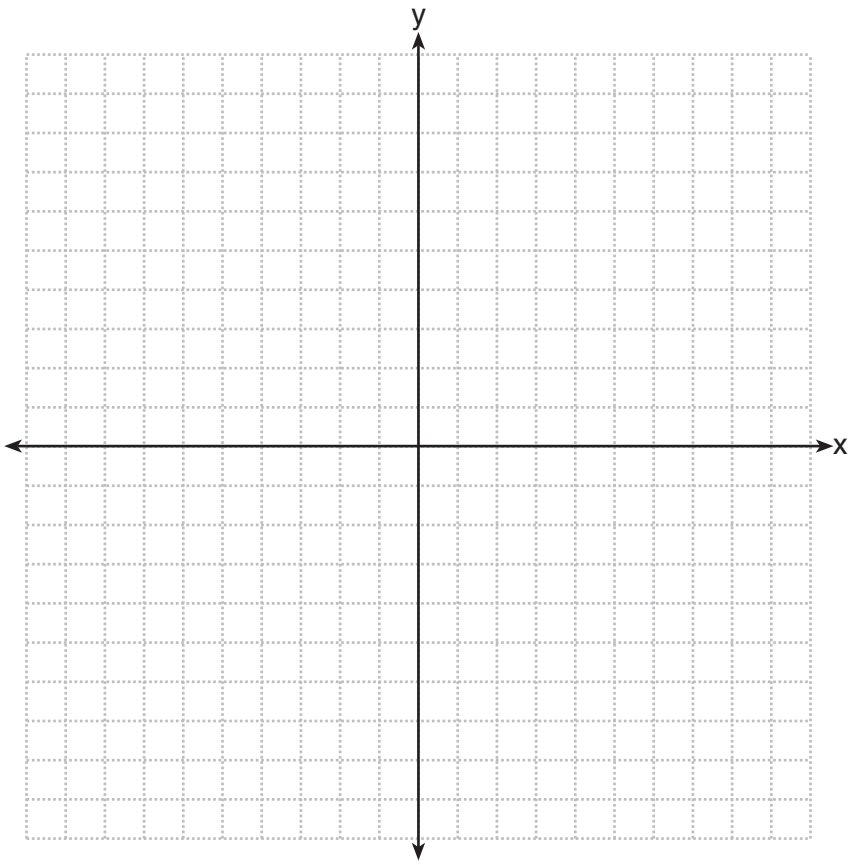


36 The vertices of $\triangle RST$ are $R(-6,5)$, $S(-7,-2)$, and $T(1,4)$.

The image of $\triangle RST$ after the composition $T_{-2,3} \circ r_{y=x}$ is $\triangle R''S''T''$.

State the coordinates of $\triangle R''S''T''$.

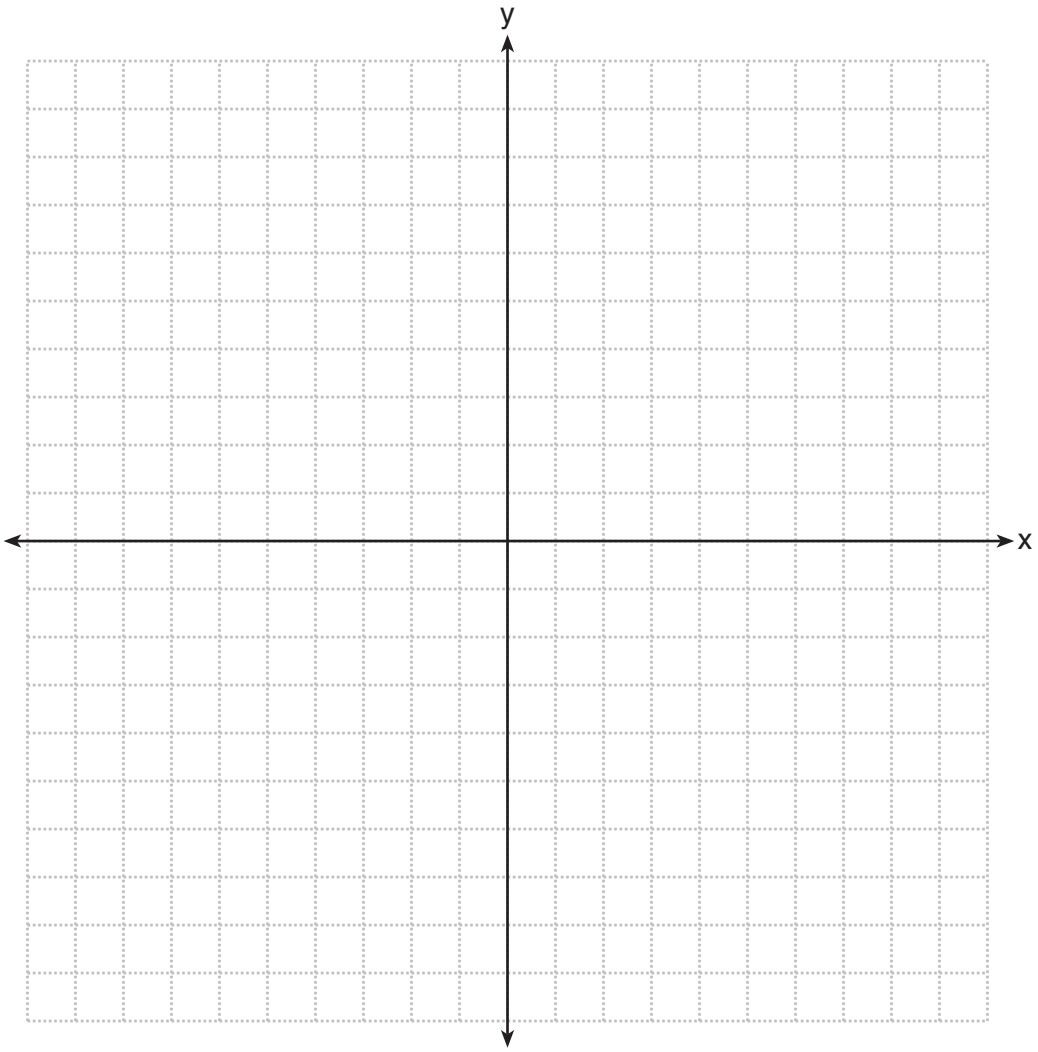
[The use of the set of axes below is optional.]



37 On the set of axes below, solve the following system of equations graphically and state the coordinates of *all* points in the solution.

$$(x + 3)^2 + (y - 2)^2 = 25$$

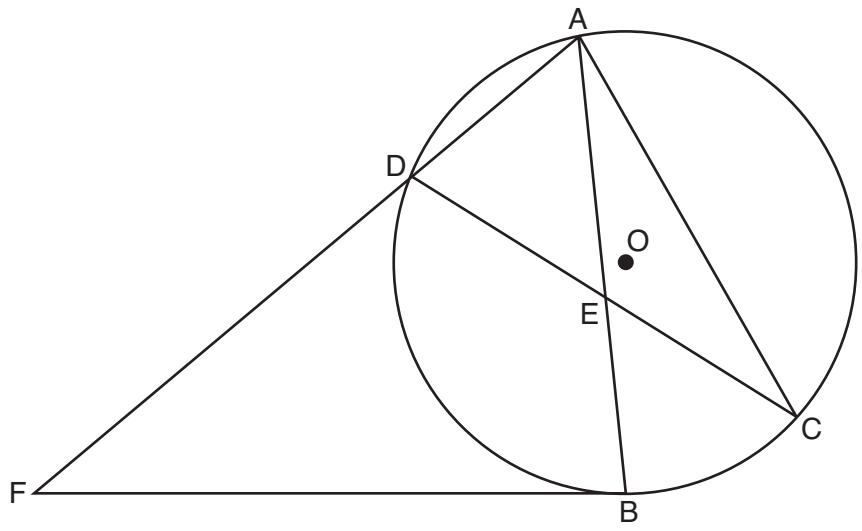
$$2y + 4 = -x$$



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, except for graphs and drawings, which should be done in pencil. [6]

38 Chords $\overline{AB}$ and $\overline{CD}$ intersect at E in circle O, as shown in the diagram below. Secant $\overline{FDA}$ and tangent $\overline{FB}$ are drawn to circle O from external point F and chord $\overline{AC}$ is drawn. The $m\overset{\frown}{DA} = 56$, $m\overset{\frown}{DB} = 112$, and the ratio of $m\overset{\frown}{AC} : m\overset{\frown}{CB} = 3:1$.



Determine $m\angle CEB$.

Determine $m\angle F$.

Determine $m\angle DAC$.

Tear Here

Reference Sheet

Volume	Cylinder	$V = Bh$ where B is the area of the base
	Pyramid	$V = \frac{1}{3}Bh$ where B is the area of the base
	Right Circular Cone	$V = \frac{1}{3}Bh$ where B is the area of the base
	Sphere	$V = \frac{4}{3}\pi r^3$

Lateral Area (L)	Right Circular Cylinder	$L = 2\pi rh$
	Right Circular Cone	$L = \pi rl$ where l is the slant height

Surface Area	Sphere	$SA = 4\pi r^2$

Tear Here

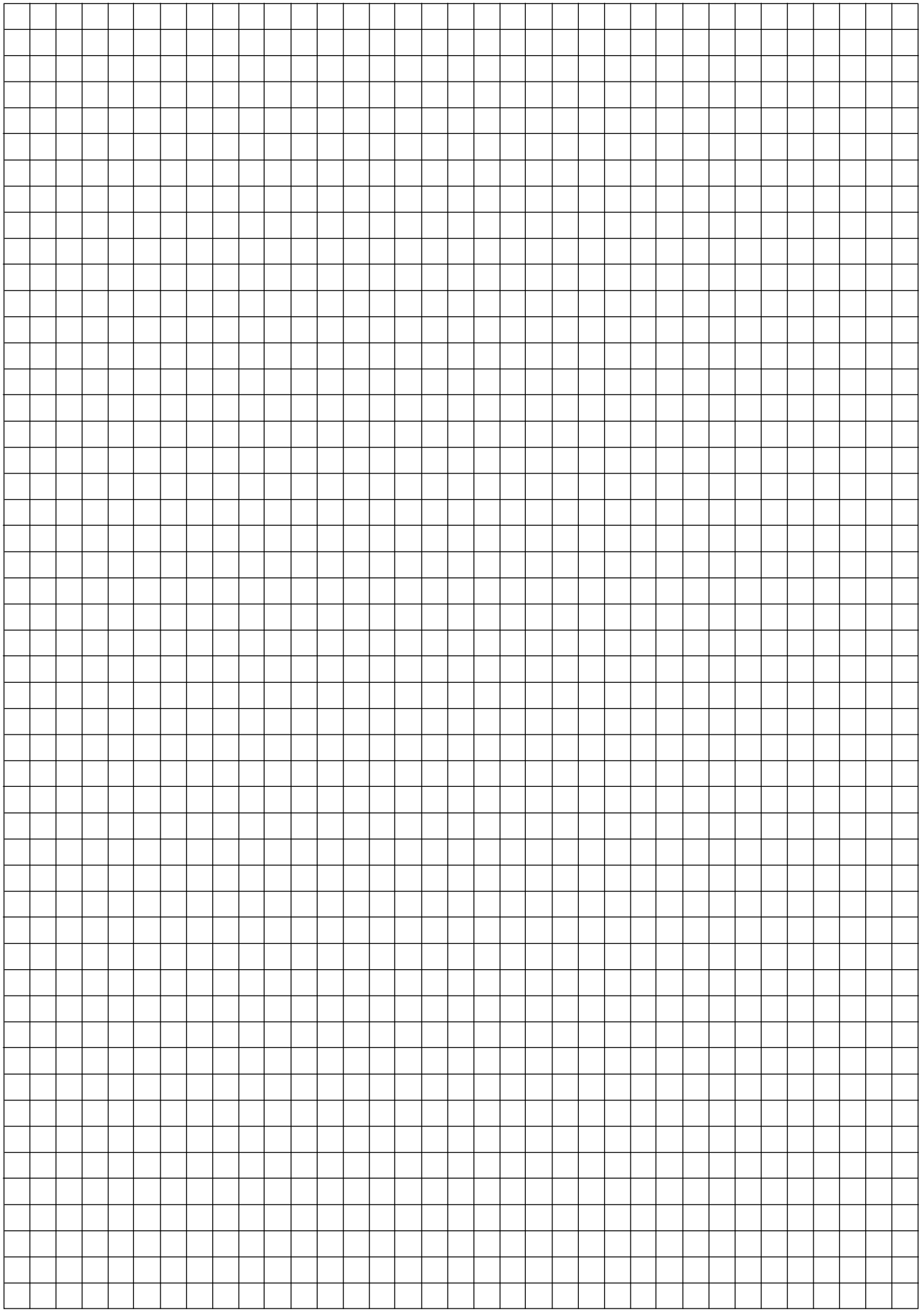
Tear Here

Tear Here

Tear Here

Tear Here

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



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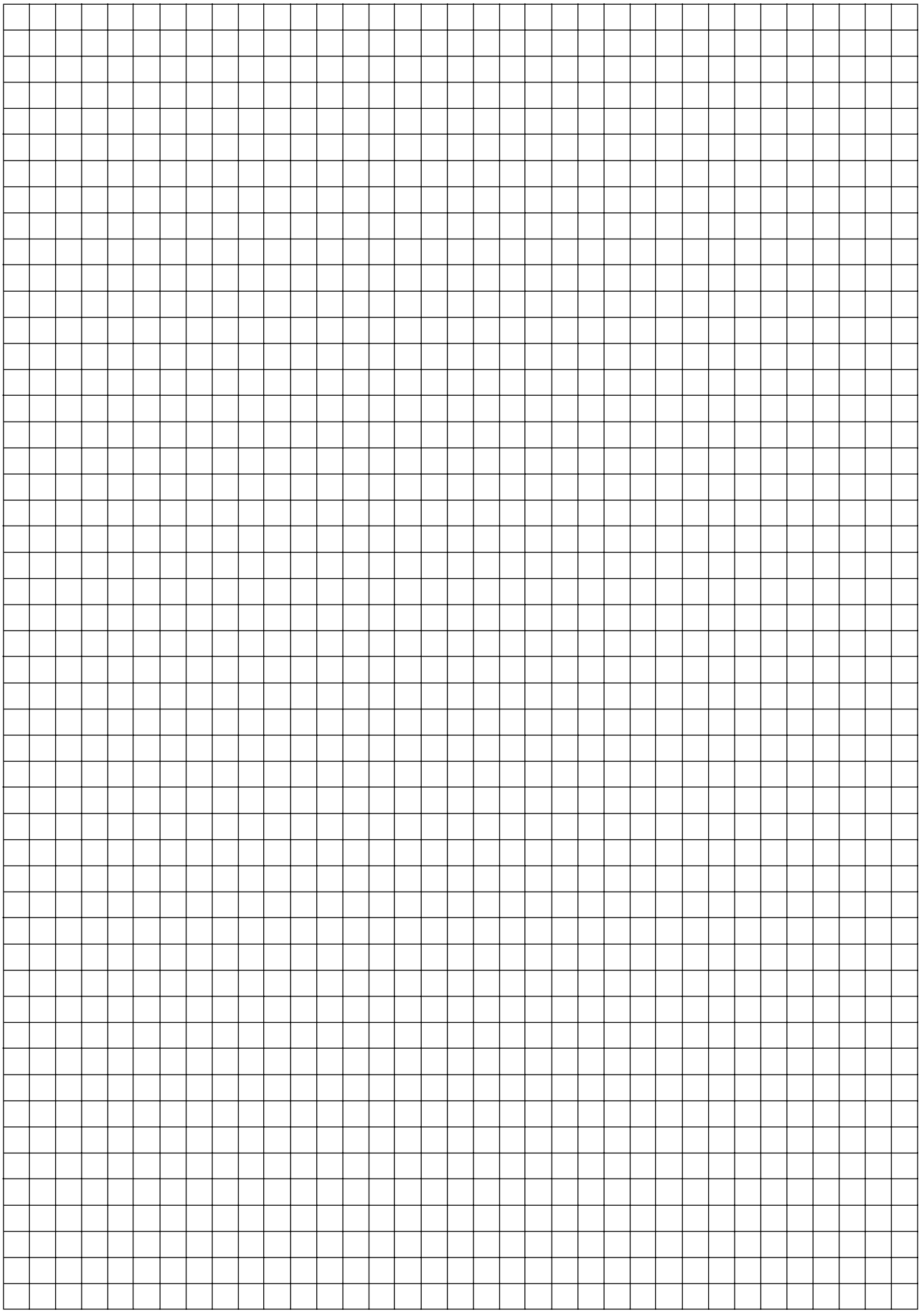

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GEOMETRY

FOR TEACHERS ONLY

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REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Thursday, August 16, 2012 — 8:30 to 11:30 a.m., only

SCORING KEY AND RATING GUIDE

Mechanics of Rating

The following procedures are to be followed for scoring student answer papers for the Regents Examination in Geometry. 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 Thursday, August 16, 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 maximum of 56 credits, 2 credits for each of the following.

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

*See *Important Notice: Notice to Teachers, Question 11, Only*:
http://www.nysedregents.org/Geometry/812/in-geom812.pdf

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 Geometry 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.

(29) **[2]** A correctly worded negation of the statement is written, and false.

[1] A correctly worded negation of the statement is written, but the truth value is missing or is incorrect.

[0] False, but no statement is written.

or

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

(30) **[2]** $A'(-2,1)$, $B'(-3,-4)$, and $C'(5,-3)$ are stated.

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

or

[1] Appropriate work is shown, but one conceptual error is made, such as rotating in a clockwise direction.

or

[1] $\triangle A'B'C'$ is graphed and labeled correctly, but the coordinates are not stated or are stated incorrectly.

or

[1] $(-2,1)$, $(-3,-4)$, and $(5,-3)$ are stated, but the coordinates are not labeled or are labeled incorrectly.

[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]** 175π, and appropriate work is shown.

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

or

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

or

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

or

[1] 175π, 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]** $2\sqrt{10}$, and appropriate work is shown.

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

or

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

or

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

or

[1] $2\sqrt{10}$, 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]** A correct construction is drawn showing all appropriate arcs.

[1] Appropriate work is shown, but one construction error is made, such as not drawing the perpendicular line.

[0] A drawing that is not an appropriate construction 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.

(34) **[2]** The lines $x = 3$ and $x = -3$ are graphed, and the appropriate points are labeled with an **X**.

[1] One conceptual error is made, such as graphing the lines $y = 3$ and $y = -3$, but the appropriate points are labeled with an **X**.

or

[1] The line $x = 3$ or $x = -3$ is graphed, and the appropriate points are labeled with an **X**.

or

[1] The lines $x = 3$ and $x = -3$ are graphed, but the appropriate points are not labeled or are labeled incorrectly.

or

[1] The lines $x = 3$ and $x = -3$ are not graphed, but the appropriate points are labeled with an **X**.

[0] The line $x = 3$ or $x = -3$ is graphed, 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 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.

(35) **[4]** 11, and appropriate algebraic work is shown.

[3] Appropriate work is shown, but one computational or factoring error is made, but an appropriate value for *TE* is found.

or

[3] Appropriate work is shown to find $x = 2$, but no further correct work is shown.

[2] Appropriate work is shown, but two or more computational or factoring errors are made, but an appropriate value for *TE* is found.

or

[2] Appropriate work is shown, but one conceptual error is made, but an appropriate value for *TE* is found.

or

[2] 11, but a method other than algebraic is used.

[1] Appropriate work is shown, but one conceptual error and one computational or factoring error are made, but an appropriate value for *TE* is found.

or

[1] A correct quadratic equation in standard form (set equal to zero) is written, but no further correct work is shown.

or

[1] 11, but no work is shown.

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

(36) **[4]** $R''(3,-3)$, $S''(-4,-4)$, and $T''(2,4)$ are stated, and appropriate work is shown.

[3] Appropriate work is shown, but one computational, graphing, or labeling error is made, but appropriate coordinates are stated.

or

[3] The composite transformation is graphed and labeled correctly, but the coordinates are not stated or are stated incorrectly.

[2] Appropriate work is shown, but two or more computational, graphing, or labeling errors are made, but appropriate coordinates are stated.

or

[2] Appropriate work is shown, but one conceptual error is made, such as performing the translation before the reflection, but appropriate coordinates are stated.

or

[2] Appropriate work is shown to find $R'(5,-6)$, $S'(-2,-7)$, and $T'(4,1)$, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational, graphing, or labeling error are made, but appropriate coordinates are stated.

or

[1] $R''(3,-3)$, $S''(-4,-4)$, and $T''(2,4)$ are stated, 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]** Both equations are graphed correctly, and (−8,2) and (0,−2) are stated.

[3] Appropriate work is shown, but one computational or graphing error is made, but appropriate coordinates are stated.

or

[3] Both equations are graphed correctly, but the coordinates of only one point of intersection are stated correctly.

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

or

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

or

[2] Both equations are graphed correctly, but the coordinates of the points of intersection are not stated or are stated incorrectly.

or

[2] (−8,2) and (0,−2) are stated, but a method other than graphic is used.

[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made, but appropriate coordinates are stated.

or

[1] One of the equations is graphed correctly, but no further correct work is shown.

or

[1] (−8,2) and (0,−2) are stated, 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.

(38) **[6]** 52, 40, and 80, and appropriate work is shown.

[5] Appropriate work is shown, but one computational error is made, but appropriate angle measures are found for all three angles.

or

[5] Appropriate work is shown to find $m\angle CEB = 52$ and $m\angle F = 40$, but no further correct work is shown.

[4] Appropriate work is shown, but two computational errors are made, but appropriate angle measures are found for all three angles.

or

[4] Appropriate work is shown to find $m\angle DAC = 80$ and either $m\angle CEB = 52$ or $m\angle F = 40$, but no further correct work is shown.

[3] Appropriate work is shown, but three or more computational errors are made, but appropriate angle measures are found for all three angles.

or

[3] Appropriate work is shown, but one conceptual error is made, but appropriate angle measures are found for all three angles.

or

[3] Appropriate work is shown to find $m\angle CEB = 52$ or $m\angle F = 40$, but no further correct work is shown.

[2] Appropriate work is shown, but one conceptual error and one computational error are made, but appropriate angle measures are found for all three angles.

or

[2] Appropriate work is shown to find $m\angle DAC = 80$, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and two or more computational errors are made, but appropriate angle measures are found for all three angles.

or

[1] Appropriate work is shown to find $m\overset{\frown}{BC} = 48$, but no further correct work is shown.

or

[1] 52, 40, and 80, 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 Band	Item Numbers
Geometric Relationships	11, 15, 18, 31
Constructions	5, 33
Locus	24, 34
Informal and Formal Proofs	1, 6, 7, 8, 10, 13, 14, 16, 19, 20, 21, 22, 23, 27, 29, 35, 38
Transformational Geometry	2, 4, 30, 36
Coordinate Geometry	3, 9, 12, 17, 25, 26, 28, 32, 37

Regents Examination in Geometry

August 2012

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

The *Chart for Determining the Final Examination Score for the August 2012 Regents Examination in Geometry* will be posted on the Department's web site at: http://www.p12.nysed.gov/apda/ on Thursday, August 16, 2012. Conversion charts provided for previous administrations of the Regents Examination in Geometry 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
THE STATE EDUCATION DEPARTMENT
Office of Assessment Policy, Development and Administration
Albany, New York 12234

IMPORTANT NOTICE
Notice to Teachers

Regents Examination in Geometry

Thursday, August 16, 2012, 8:30 a.m.

Question 11, only

This notice pertains to the scoring of Question 11 only, of the Regents Examination in Geometry.

A correct solution is not provided for Question 11; therefore, all students shall be awarded credit for this question.

Please photocopy this notice and give a copy of it to each teacher scoring the Regents Examination in Geometry.

We apologize for any inconvenience this may cause you, and we thank you for your hard work on behalf of the students in New York State.

Regents Examination in Geometry – August 2012

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

Raw Score	Scale Score
86	100
85	98
84	97
83	95
82	94
81	93
80	91
79	90
78	89
77	88
76	88
75	87
74	86
73	85
72	84
71	84
70	83
69	82
68	82
67	81
66	81
65	80

Raw Score	Scale Score
64	79
63	79
62	78
61	78
60	77
59	77
58	76
57	76
56	75
55	75
54	74
53	74
52	73
51	72
50	72
49	71
48	71
47	70
46	69
45	69
44	68
43	67

Raw Score	Scale Score
42	67
41	66
40	65
39	64
38	63
37	62
36	62
35	61
34	60
33	59
32	58
31	57
30	56
29	54
28	53
27	52
26	51
25	50
24	49
23	47
22	46
21	44

Raw Score	Scale Score
20	43
19	41
18	40
17	38
16	36
15	35
14	33
13	31
12	29
11	27
10	25
9	23
8	20
7	18
6	16
5	13
4	11
3	8
2	6
1	3
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 Geometry.