The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Wednesday, June 20, 2012 — 9:15 a.m. to 12:15 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 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.

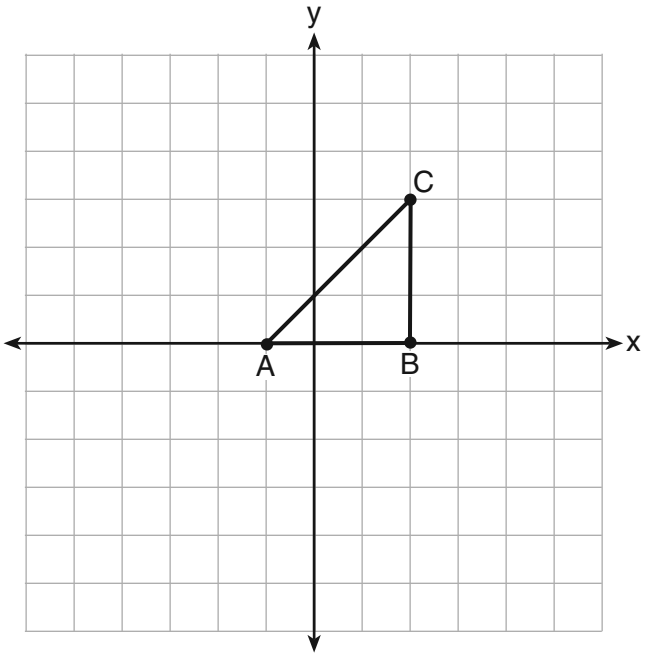
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer all 28 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. 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. [56]

Use this space for computations.

1 Triangle *ABC* is graphed on the set of axes below.



Which transformation produces an image that is similar to, but *not* congruent to, $\triangle ABC$?

(1) $T_{2,3}$

(2) D_2

(3) $r_{y=x}$

(4) R_{90}

2 A student wrote the sentence "4 is an odd integer." What is the negation of this sentence and the truth value of the negation?

(1) 3 is an odd integer; true

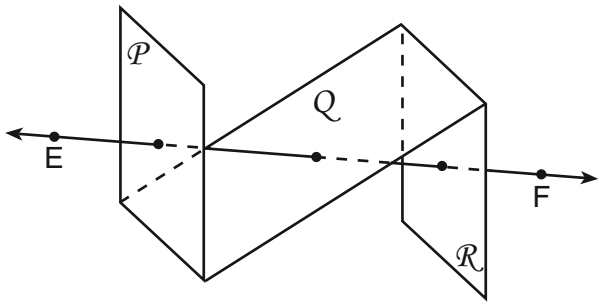
(2) 4 is not an odd integer; true

(3) 4 is not an even integer; false

(4) 4 is an even integer; false

Use this space for computations.

3 As shown in the diagram below, $\overleftrightarrow{EF}$ intersects planes $\mathcal{P}$, $\mathcal{Q}$, and $\mathcal{R}$.



If $\overleftrightarrow{EF}$ is perpendicular to planes $\mathcal{P}$ and $\mathcal{R}$, which statement must be true?

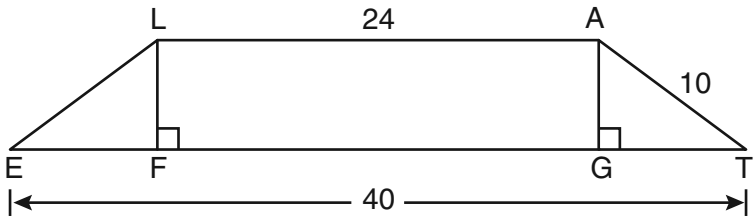
(1) Plane $\mathcal{P}$ is perpendicular to plane $\mathcal{Q}$.

(2) Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{P}$.

(3) Plane $\mathcal{P}$ is parallel to plane $\mathcal{Q}$.

(4) Plane $\mathcal{R}$ is parallel to plane $\mathcal{P}$.

4 In the diagram below, $LATE$ is an isosceles trapezoid with $\overline{LE} \cong \overline{AT}$, $LA = 24$, $ET = 40$, and $AT = 10$. Altitudes $\overline{LF}$ and $\overline{AG}$ are drawn.



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

(1) 6

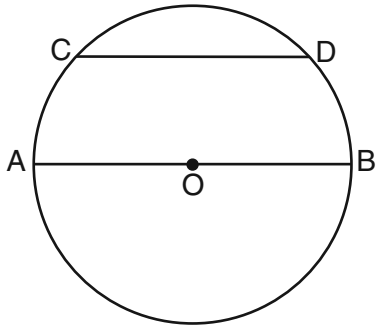
(2) 8

(3) 3

(4) 4

Use this space for computations.

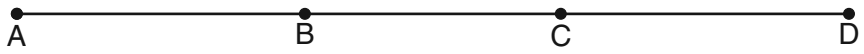
5 In the diagram below of circle O, diameter $\overline{AB}$ is parallel to chord $\overline{CD}$.



If $m\widehat{CD} = 70$, what is $m\widehat{AC}$?

(1) 110
(2) 70
(3) 55
(4) 35

6 In the diagram below of $\overline{ABCD}$, $\overline{AC} \cong \overline{BD}$.



Using this information, it could be proven that

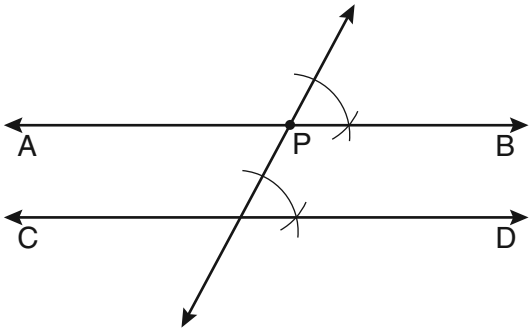
(1) $BC = AB$
(2) $AB = CD$
(3) $AD - BC = CD$
(4) $AB + CD = AD$

7 The diameter of a sphere is 15 inches. What is the volume of the sphere, to the *nearest tenth of a cubic inch*?

(1) 706.9
(2) 1767.1
(3) 2827.4
(4) 14,137.2

Use this space for computations.

8 The diagram below shows the construction of $\overleftrightarrow{AB}$ through point P parallel to $\overleftrightarrow{CD}$.



Which theorem justifies this method of construction?

(1) If two lines in a plane are perpendicular to a transversal at different points, then the lines are parallel.

(2) If two lines in a plane are cut by a transversal to form congruent corresponding angles, then the lines are parallel.

(3) If two lines in a plane are cut by a transversal to form congruent alternate interior angles, then the lines are parallel.

(4) If two lines in a plane are cut by a transversal to form congruent alternate exterior angles, then the lines are parallel.

9 Parallelogram $ABCD$ has coordinates $A(1,5)$, $B(6,3)$, $C(3,-1)$, and $D(-2,1)$. What are the coordinates of E, the intersection of diagonals $\overline{AC}$ and $\overline{BD}$?

(1) (2,2)

(2) (4.5,1)

(3) (3.5,2)

(4) (−1,3)

10 What is the equation of a circle whose center is 4 units above the origin in the coordinate plane and whose radius is 6?

(1) $x^2 + (y - 6)^2 = 16$

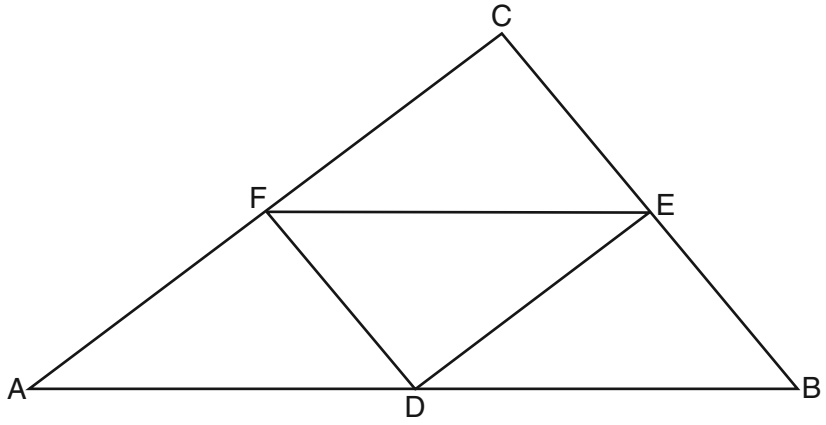
(2) $(x - 6)^2 + y^2 = 16$

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

(4) $(x - 4)^2 + y^2 = 36$

Use this space for computations.

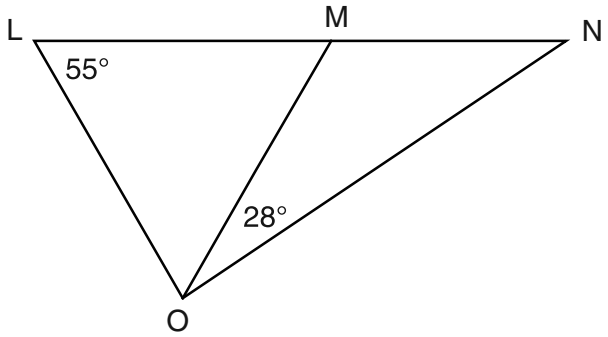
11 In the diagram of $\triangle ABC$ shown below, D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{BC}$, and F is the midpoint of $\overline{AC}$.



If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?

(1) 24
(3) 40
(2) 36
(4) 44

12 In the diagram below, $\triangle LMO$ is isosceles with $LO = MO$.



If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?

(1) 27
(3) 42
(2) 28
(4) 70

Use this space for computations.

13 If $\overleftrightarrow{AB}$ is contained in plane $\mathcal{P}$, and $\overleftrightarrow{AB}$ is perpendicular to plane $\mathcal{R}$, which statement is true?

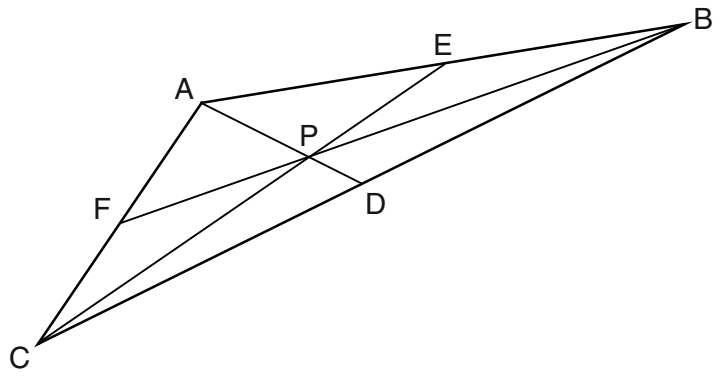
(1) $\overleftrightarrow{AB}$ is parallel to plane $\mathcal{R}$.

(2) Plane $\mathcal{P}$ is parallel to plane $\mathcal{R}$.

(3) $\overleftrightarrow{AB}$ is perpendicular to plane $\mathcal{P}$.

(4) Plane $\mathcal{P}$ is perpendicular to plane $\mathcal{R}$.

14 In the diagram below of $\triangle ABC$, $\overline{AE} \cong \overline{BE}$, $\overline{AF} \cong \overline{CF}$, and $\overline{CD} \cong \overline{BD}$.



Point P must be the

(1) centroid

(2) circumcenter

(3) incenter

(4) orthocenter

15 What is the equation of the line that passes through the point $(-9,6)$ and is perpendicular to the line $y = 3x - 5$?

(1) $y = 3x + 21$

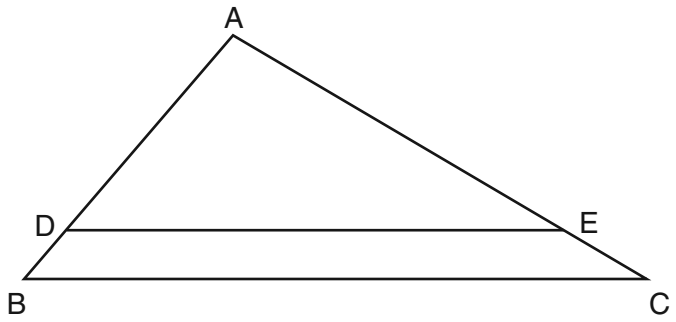
(2) $y = -\frac{1}{3}x - 3$

(3) $y = 3x + 33$

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

Use this space for computations.

16 In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.



If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?

(1) 6

(2) 2

(3) 3

(4) 15

17 What is the length of $\overline{AB}$ with endpoints $A(-1,0)$ and $B(4,-3)$?

(1) $\sqrt{6}$

(2) $\sqrt{18}$

(3) $\sqrt{34}$

(4) $\sqrt{50}$

18 The sum of the interior angles of a polygon of n sides is

(1) 360

(2) $\frac{360}{n}$

(3) $(n - 2) \cdot 180$

(4) $\frac{(n - 2) \cdot 180}{n}$

Use this space for computations.

19 What is the slope of a line perpendicular to the line whose equation is $20x - 2y = 6$?

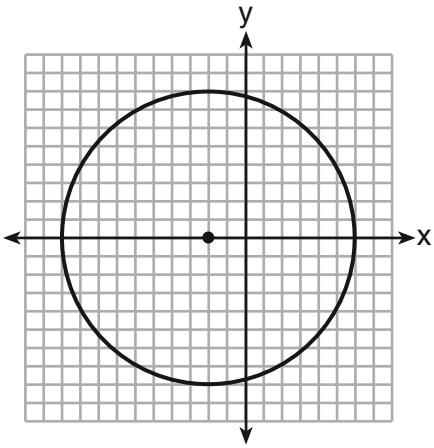
(1) -10

(2) $-\frac{1}{10}$

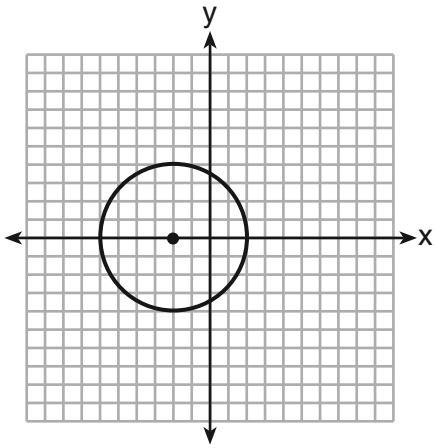
(3) 10

(4) $\frac{1}{10}$

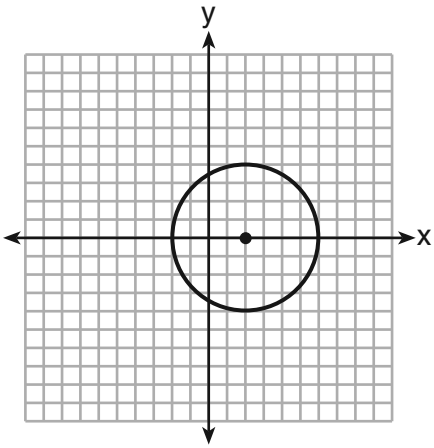
20 Which graph represents a circle whose equation is $(x + 2)^2 + y^2 = 16$?



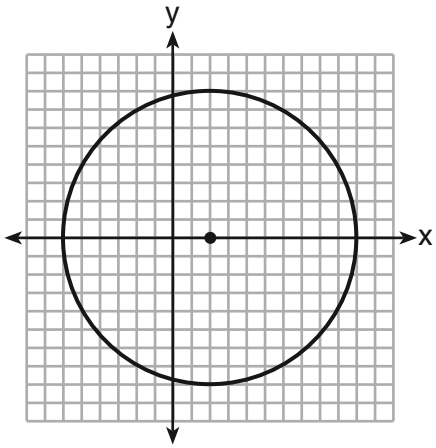
(1)



(3)



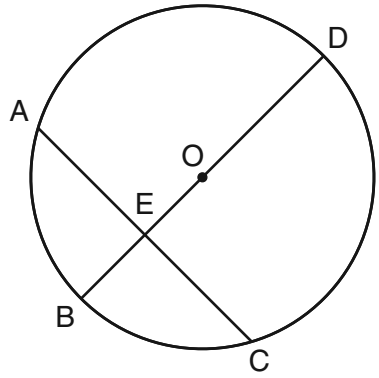
(2)



(4)

Use this space for computations.

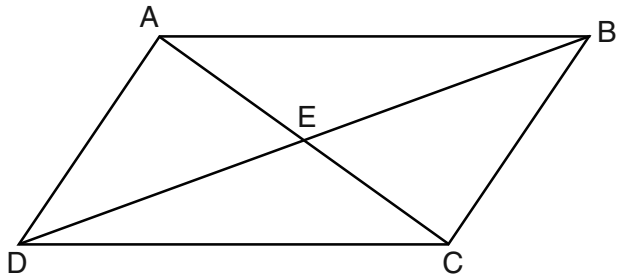
21 In circle O shown below, diameter $\overline{DB}$ is perpendicular to chord $\overline{AC}$ at E.



If $DB = 34$, $AC = 30$, and $DE > BE$, what is the length of $\overline{BE}$?

(1) 8
(2) 9
(3) 16
(4) 25

22 In parallelogram $ABCD$ shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



Which statement must be true?

(1) $\overline{AC} \cong \overline{DB}$
(2) $\angle ABD \cong \angle CBD$
(3) $\triangle AED \cong \triangle CEB$
(4) $\triangle DCE \cong \triangle BCE$

Use this space for computations.

23 Which equation of a circle will have a graph that lies entirely in the first quadrant?

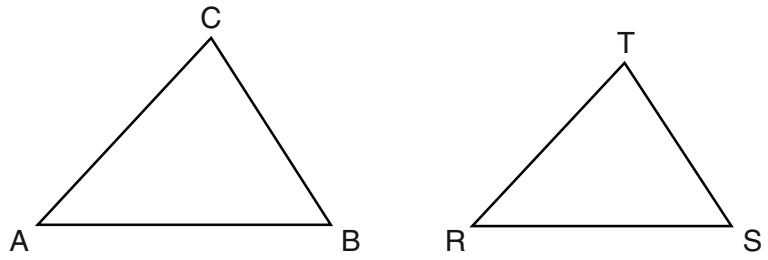
(1) $(x - 4)^2 + (y - 5)^2 = 9$

(2) $(x + 4)^2 + (y + 5)^2 = 9$

(3) $(x + 4)^2 + (y + 5)^2 = 25$

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

24 In the diagram below, $\triangle ABC \sim \triangle RST$.



Which statement is *not* true?

(1) $\angle A \cong \angle R$

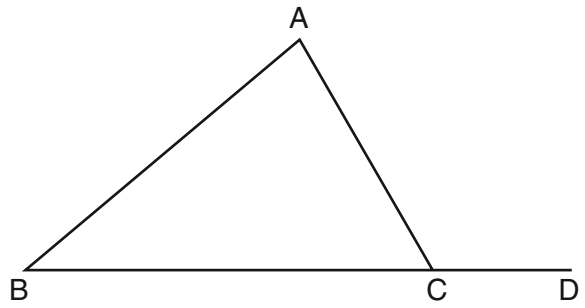
(2) $\frac{AB}{RS} = \frac{BC}{ST}$

(3) $\frac{AB}{BC} = \frac{ST}{RS}$

(4) $\frac{AB + BC + AC}{RS + ST + RT} = \frac{AB}{RS}$

Use this space for computations.

25 In the diagram below of $\triangle ABC$, $\overline{BC}$ is extended to D.



(Not drawn to scale)

If $m\angle A = x^2 - 6x$, $m\angle B = 2x - 3$, and $m\angle ACD = 9x + 27$, what is the value of x?

(1) 10

(2) 2

(3) 3

(4) 15

26 An equation of the line that passes through $(2,-1)$ and is parallel to the line $2y + 3x = 8$ is

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

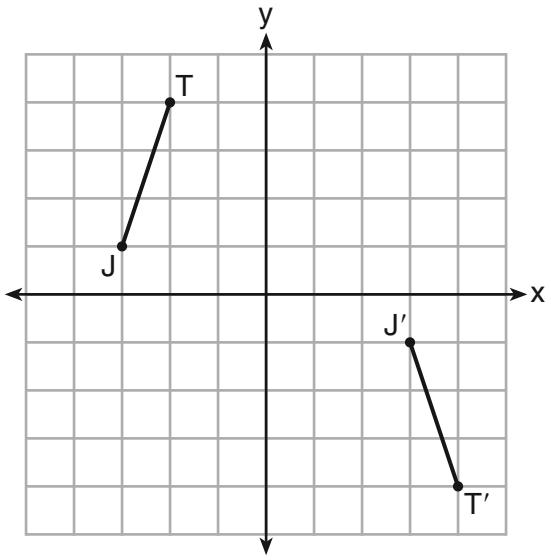
(2) $y = \frac{3}{2}x + 4$

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

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

Use this space for computations.

27 The graph below shows $\overline{JT}$ and its image, $\overline{J'T'}$, after a transformation.



Which transformation would map $\overline{JT}$ onto $\overline{J'T'}$?

(1) translation
(2) glide reflection
(3) rotation centered at the origin
(4) reflection through the origin

28 Which reason could be used to prove that a parallelogram is a rhombus?

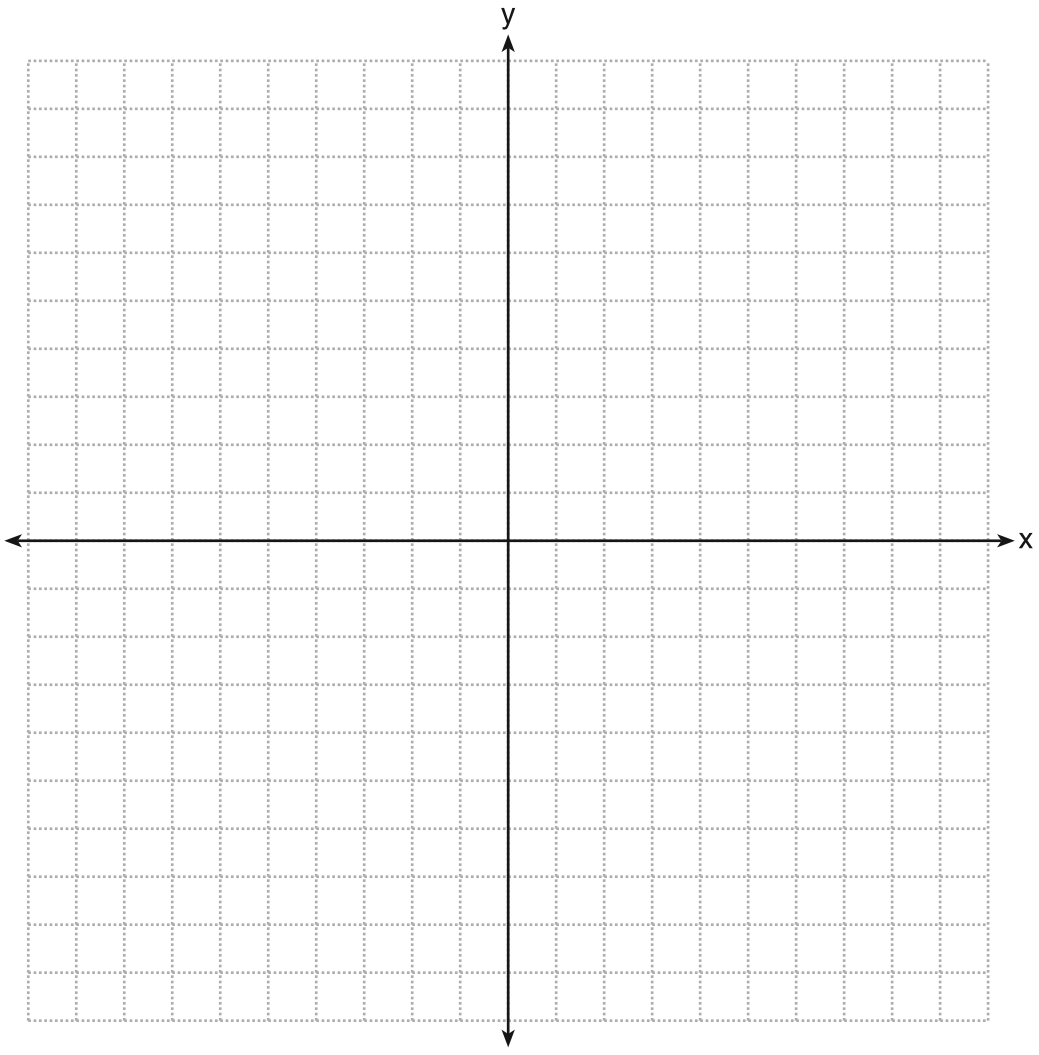
(1) Diagonals are congruent.
(2) Opposite sides are parallel.
(3) Diagonals are perpendicular.
(4) Opposite angles are congruent.

Part II

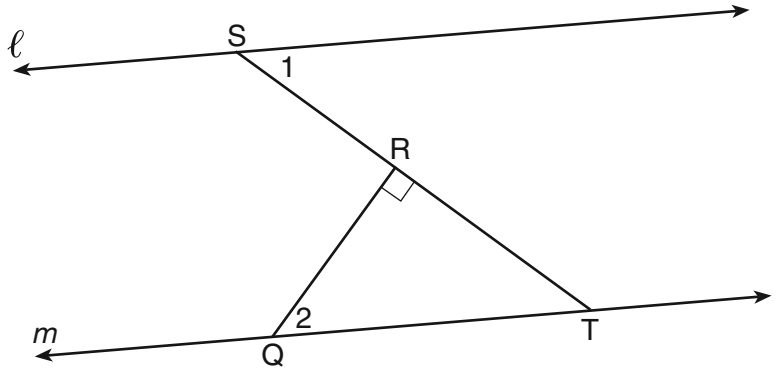
Answer all 6 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [12]

29 Triangle TAP has coordinates $T(-1,4)$, $A(2,4)$, and $P(2,0)$.

On the set of axes below, graph and label $\triangle T'A'P'$, the image of $\triangle TAP$ after the translation $(x,y) \rightarrow (x - 5, y - 1)$.



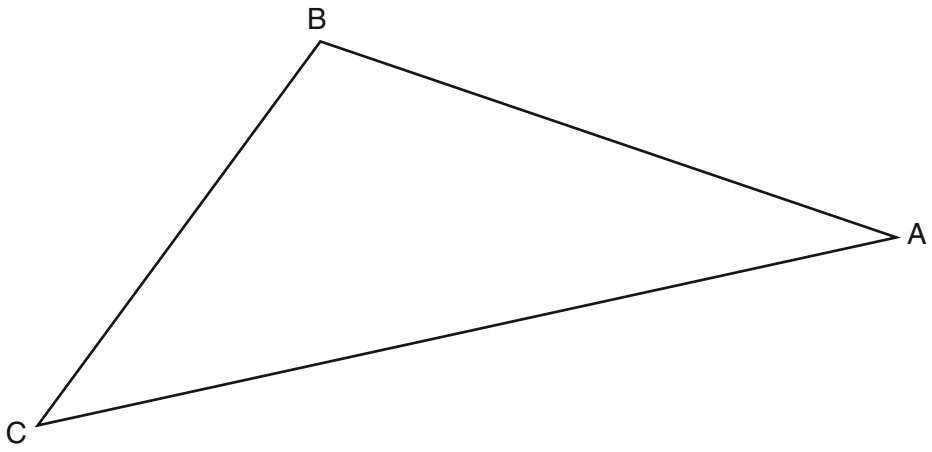
30 In the diagram below, $\ell \parallel m$ and $\overline{QR} \perp \overline{ST}$ at R.



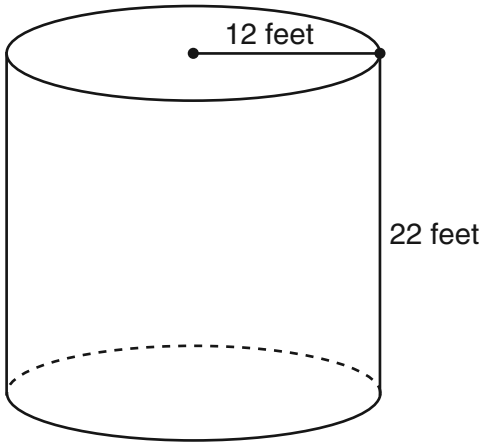
If m∠1 = 63, find m∠2.

31 Two lines are represented by the equations $x + 2y = 4$ and $4y - 2x = 12$. Determine whether these lines are parallel, perpendicular, or neither. Justify your answer.

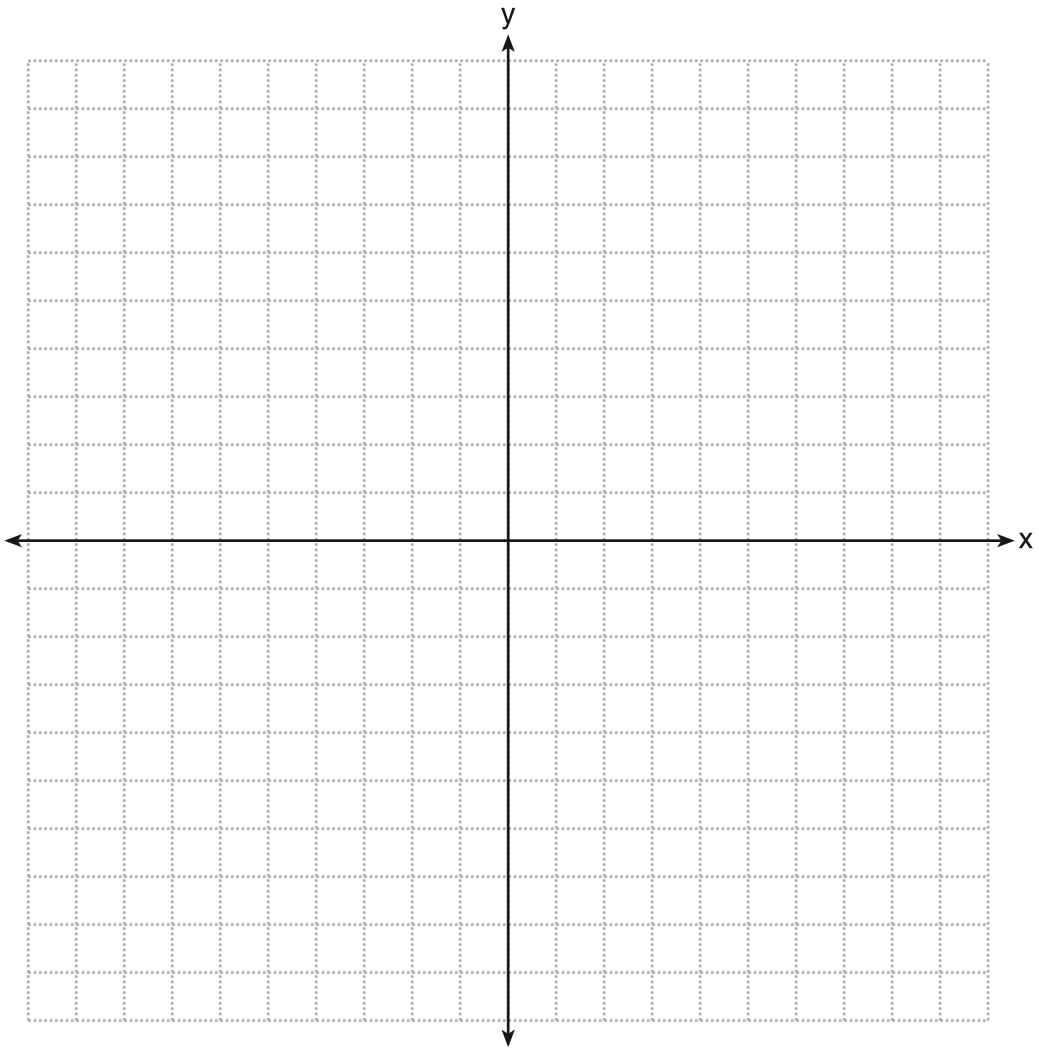
32 Using a compass and straightedge, construct the bisector of $\angle CBA$.
[Leave all construction marks.]



33 The cylindrical tank shown in the diagram below is to be painted. The tank is open at the top, and the bottom does *not* need to be painted. Only the outside needs to be painted. Each can of paint covers 600 square feet. How many cans of paint must be purchased to complete the job?



34 On the set of axes below, graph the locus of points that are 4 units from the line $x = 3$ and the locus of points that are 5 units from the point (0,2). Label with an **X** *all* points that satisfy *both* conditions.



Part III

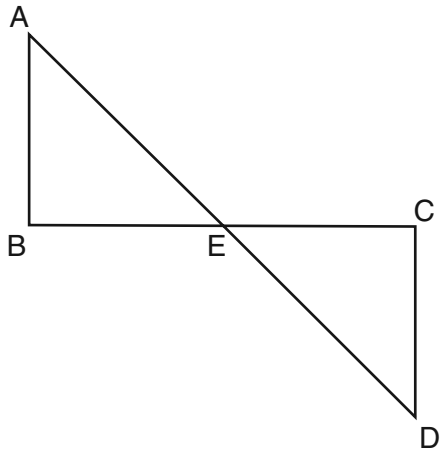
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [12]

35 Given: $\overline{AD}$ bisects $\overline{BC}$ at E.

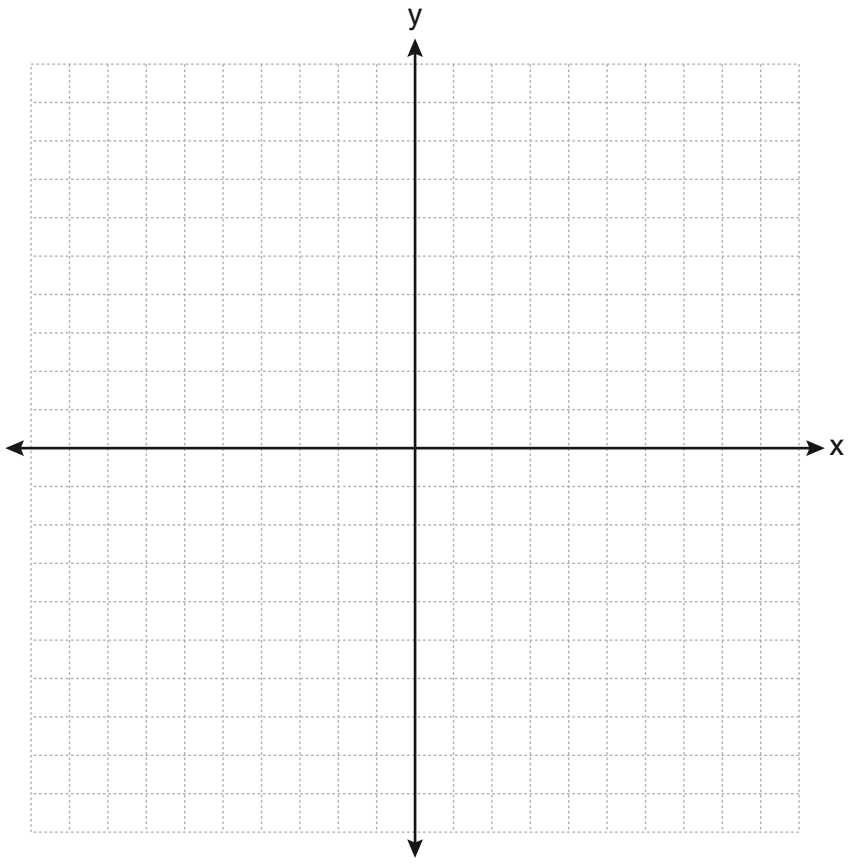
$\overline{AB} \perp \overline{BC}$

$\overline{DC} \perp \overline{BC}$

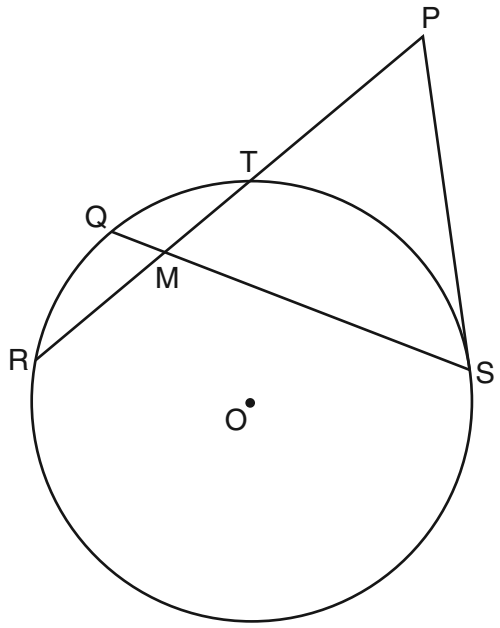
Prove: $\overline{AB} \cong \overline{DC}$



36 The coordinates of trapezoid $ABCD$ are $A(-4,5)$, $B(1,5)$, $C(1,2)$, and $D(-6,2)$. Trapezoid $A''B''C''D''$ is the image after the composition $r_{x\text{-axis}} \circ r_{y = x}$ is performed on trapezoid $ABCD$. State the coordinates of trapezoid $A''B''C''D''$.
[The use of the set of axes below is optional.]



37 In the diagram below of circle O, chords $\overline{RT}$ and $\overline{QS}$ intersect at M. Secant $\overline{PTR}$ and tangent $\overline{PS}$ are drawn to circle O. The length of $\overline{RM}$ is two more than the length of $\overline{TM}$, $QM = 2$, $SM = 12$, and $PT = 8$.



Find the length of $\overline{RT}$.

Find the length of $\overline{PS}$.

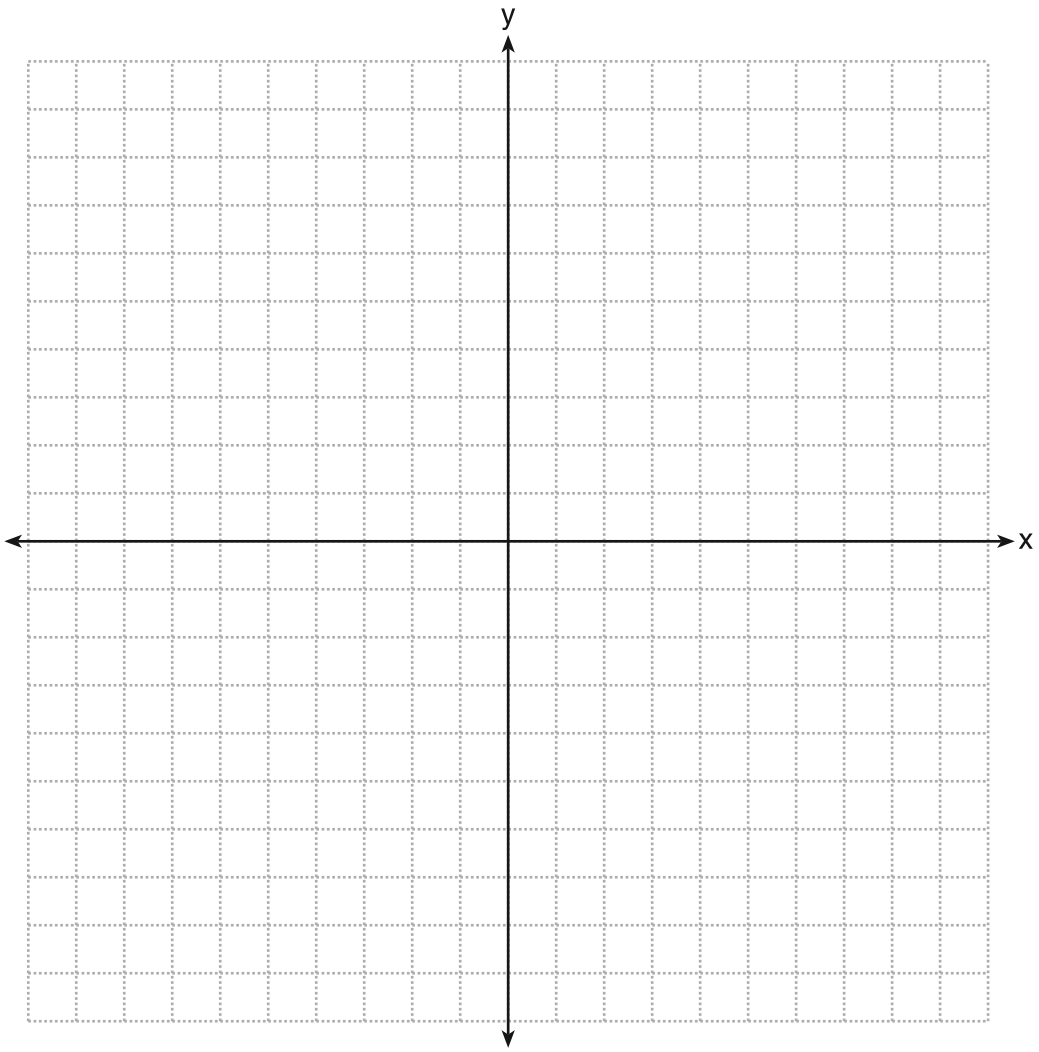
Part IV

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

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

$$2y + 16 = 4x$$



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	$SA = 4\pi r^2$

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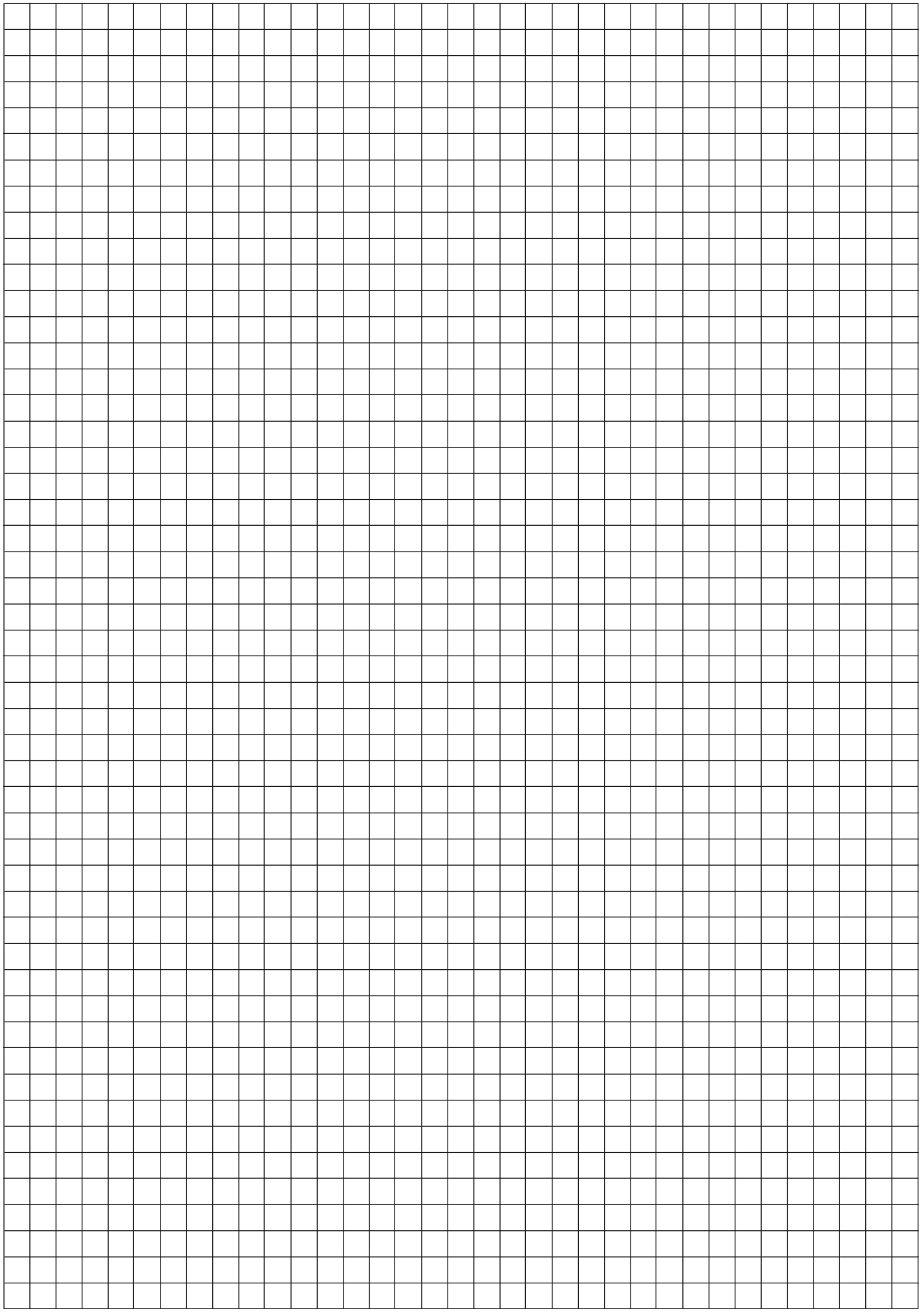
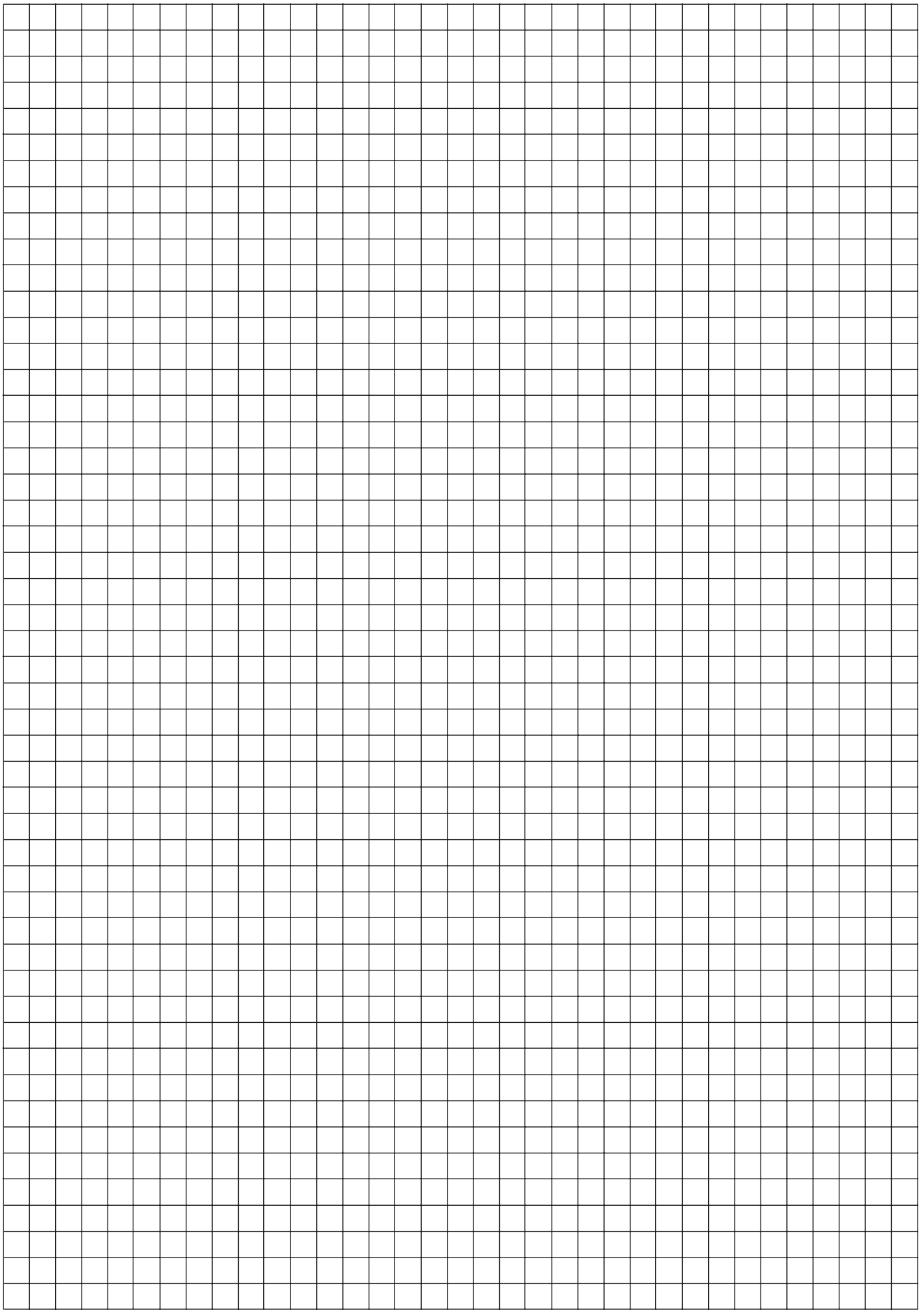
Scrap Graph Paper — This sheet will *not* be scored.



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



Tear Here

Tear Here

GEOMETRY

FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Wednesday, June 20, 2012 — 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 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 Wednesday, June 20, 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 56 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) 2	(8) 2	(15) 4	(22) . . . . . 3 . . . . .
(2) 2	(9) 1	(16) 3	(23) . . . . . 1 . . . . .
(3) 4	(10) 3	(17) 3	(24) . . . . . 3 . . . . .
(4) 1	(11) 4	(18) 3	(25) . . . . . 4 . . . . .
(5) 3	(12) 1	(19) 2	(26) . . . . . 4 . . . . .
(6) 2	(13) 4	(20) 3	(27) . . . . . 2 . . . . .
(7) 2	(14) 1	(21) 2	(28) . . . . . 3 . . . . .

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: http://www.p12.nysed.gov/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]** $\triangle T'A'P'$ is graphed and labeled correctly.

[1] Appropriate work is shown, but one computational or graphing error is made, but an appropriate triangle is graphed and labeled.

or

[1] Appropriate work is shown, but one conceptual error is made, but an appropriate triangle is graphed and labeled.

or

[1] The translation is performed correctly, but the triangle is not labeled or is labeled incorrectly.

or

[1] $T'(-6,3)$, $A'(-3,3)$, and $P'(-3,-1)$ are stated, but no graph is drawn.

[0] (–6,3), (–3,3), and (–3,–1) are stated, but they are not labeled, and 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.

(30) **[2]** 27, and appropriate work is shown, such as a labeled diagram.

[1] Appropriate work is shown, but one computational error is made, but an appropriate value for m$\angle 2$ is found.

or

[1] Appropriate work is shown, but one conceptual error is made, but an appropriate value for m$\angle 2$ is found.

or

[1] 27, 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]** Neither, and an appropriate justification is given.

[1] Appropriate work is shown, but one computational error is made, but an appropriate determination is made and justified.

or

[1] Appropriate work is shown, but one conceptual error is made, but an appropriate determination is made and justified.

or

[1] Slopes of $-\frac{1}{2}$ and $\frac{1}{2}$ are identified, but the word "neither" is not stated.

[0] Neither, but no work is shown, and no justification is given.

or

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

(32) **[2]** A correct construction is drawn showing all appropriate arcs, and the angle bisector is drawn.

[1] Appropriate construction arcs are drawn, but one construction error is made, such as not drawing the angle bisector ray.

or

[1] Appropriate work is shown, but a correct bisector is constructed on either $\angle A$ or $\angle C$.

[0] A drawing that is not an appropriate construction is shown, such as constructing the perpendicular bisector of a side of the triangle.

or

[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]** 3, and appropriate work is shown.

[1] Appropriate work is shown, but one computational or rounding error is made, but an appropriate number of cans is found.

or

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

or

[1] The lateral surface area of the cylinder is calculated, but no further correct work is shown.

or

[1] 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.

(34) **[2]** Both loci are drawn correctly, and two points of intersection are labeled with an **X**.

[1] Appropriate work is shown, but one graphing error is made, but appropriate points of intersection are labeled.

or

[1] Appropriate work is shown, but one conceptual error is made, but appropriate points of intersection are labeled.

or

[1] Both loci are drawn correctly, but the points of intersection are not labeled or are labeled incorrectly.

[0] One locus is drawn 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 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]** A complete and correct proof that includes a concluding statement is written.

[3] A proof is written that demonstrates a thorough understanding of the method of proof and contains no conceptual errors, but one statement or reason is missing or is incorrect, or the concluding statement is missing.

or

[3] $\triangle ABE \cong \triangle DCE$ is proven, but no further correct work is shown.

[2] A proof is written that demonstrates a good understanding of the method of proof and contains no conceptual errors, but two statements or reasons are missing or are incorrect.

or

[2] A proof is written that demonstrates a good understanding of the method of proof, but one conceptual error is made.

[1] Some correct relevant statements about the proof are made, but three or four statements or reasons are missing or are incorrect.

[0] The "given" and/or the "prove" statements are written, but no further correct relevant statements are 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.

(36) **[4]** $A''(5,4)$, $B''(5,-1)$, $C''(2,-1)$, and $D''(2,6)$, and appropriate work is shown.

[3] Appropriate work is shown, but one computational, graphing, or labeling error is made, but appropriate coordinates for $A''B''C''D''$ are stated.

or

[3] Trapezoid $A''B''C''D''$ 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 for $A''B''C''D''$ are stated.

or

[2] Appropriate work is shown, but one conceptual error is made, such as performing the reflection over the x-axis first, but appropriate coordinates for $A''B''C''D''$ are stated.

or

[2] Appropriate work is shown to find $A'(5,-4)$, $B'(5,1)$, $C'(2,1)$, and $D'(2,-6)$, 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 for $A''B''C''D''$ are stated.

or

[1] Trapezoid $A'B'C'D'$ is graphed and labeled correctly, but no further correct work is shown.

or

[1] $A''(5,4)$, $B''(5,-1)$, $C''(2,-1)$, and $D''(2,6)$, but no work is shown.

[0] (5,4), (5,–1), (2,–1), and (2,6), 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.

(37) **[4]** 10 and 12, and appropriate work is shown.

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

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

or

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

or

[2] Appropriate work is shown to find $RT = 10$, but no further correct work is shown.

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

or

[1] Appropriate work is shown to find 4, the length of $\overline{TM}$, but no further correct work is shown.

or

[1] $TM \cdot RM = QM \cdot SM$ and $\frac{PR}{PS} = \frac{PS}{PT}$ or equivalent equations are written, but no further correct work is shown.

or

[1] 10 and 12, 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]** Both equations are graphed correctly, and (3,–2) is stated.

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

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

or

[4] Both equations are graphed correctly, but the coordinates are not stated or are stated incorrectly.

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

or

[3] (3,–2) is stated, but a method other than graphing is used.

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

or

[2] Only the parabola is graphed correctly.

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

or

[1] Only the line is graphed correctly.

or

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

Regents Examination in Geometry

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 Geometry* will be posted on the Department's web site at: http://www.p12.nysed.gov/apda/ on Wednesday, June 20, 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.

Regents Examination in Geometry – June 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	92
79	91
78	90
77	89
76	88
75	88
74	87
73	86
72	86
71	85
70	84
69	83
68	83
67	82
66	81
65	81

Raw Score	Scale Score
64	80
63	80
62	79
61	78
60	78
59	77
58	77
57	76
56	75
55	75
54	74
53	74
52	73
51	72
50	72
49	71
48	70
47	70
46	69
45	68
44	68
43	67

Raw Score	Scale Score
42	66
41	65
40	64
39	63
38	62
37	62
36	61
35	60
34	59
33	58
32	56
31	55
30	54
29	53
28	52
27	51
26	49
25	48
24	47
23	45
22	44
21	42

Raw Score	Scale Score
20	41
19	39
18	38
17	36
16	34
15	33
14	31
13	29
12	27
11	25
10	23
9	21
8	19
7	17
6	14
5	12
4	10
3	8
2	5
1	2
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.