The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Wednesday, August 17, 2011—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. Then turn to the last page of this booklet, which is the answer sheet for Part I. Fold the last page along the perforations and, slowly and carefully, tear off the answer sheet. Then fill in the heading of 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 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]

1 The statement "x is a multiple of 3, and x is an even integer" is true when x is equal to

(1) 9   (3) 3

(2) 8   (4) 6

2 In the diagram below, $\triangle ABC \cong \triangle XYZ$.
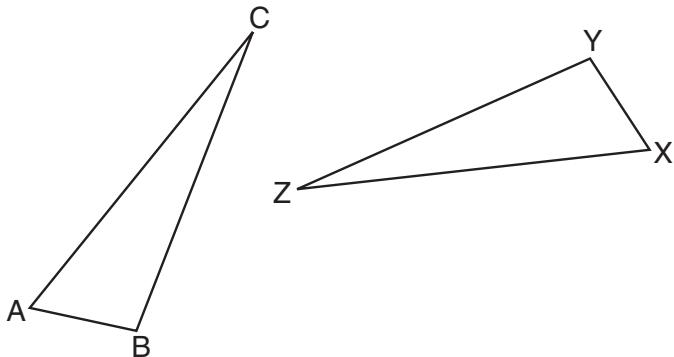
Which statement must be true?

(1) $\angle C \cong \angle Y$ (3) $\overline{AC} \cong \overline{YZ}$

(2) $\angle A \cong \angle X$ (4) $\overline{CB} \cong \overline{XZ}$

3 In the diagram below of $\triangle ABC$, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$.
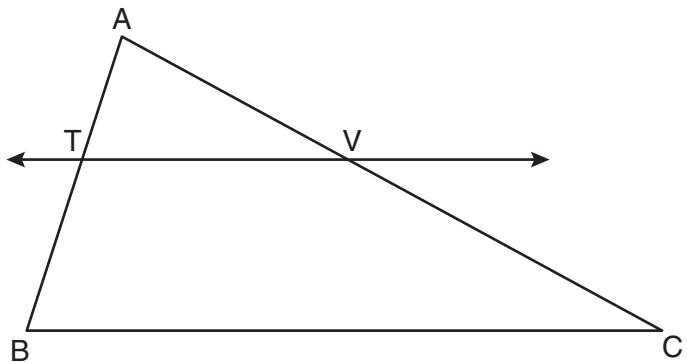
What is the length of $\overline{VC}$?

(1) $3\frac{1}{2}$ (3) 14

(2) $7\frac{1}{7}$ (4) 24

4 Pentagon $PQRST$ has $\overline{PQ}$ parallel to $\overline{TS}$. After a translation of $T_{2,-5}$, which line segment is parallel to $\overline{P'Q'}$?

(1) $\overline{R'Q'}$ (3) $\overline{T'S'}$
(2) $\overline{R'S'}$ (4) $\overline{T'P'}$

5 In the diagram below of $\triangle PAO$, $\overline{AP}$ is tangent to circle O at point A, $OB = 7$, and $BP = 18$.
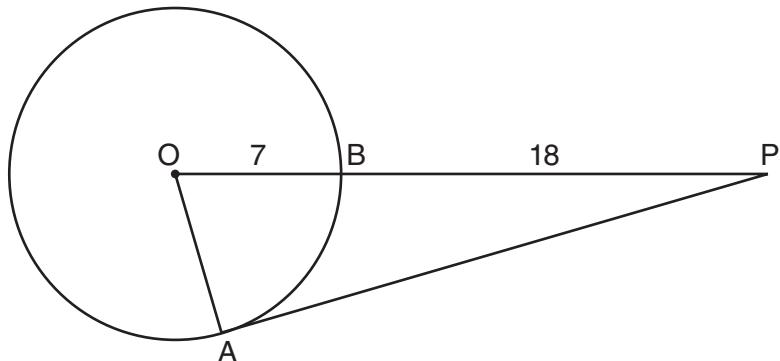
What is the length of $\overline{AP}$?

(1) 10   (3) 17

(2) 12   (4) 24

6 A straightedge and compass were used to create the construction below. Arc EF was drawn from point B, and arcs with equal radii were drawn from E and F.
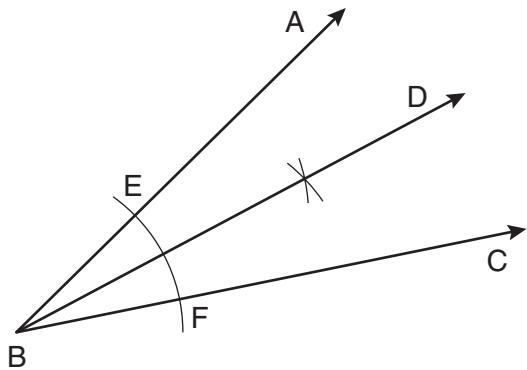
Which statement is *false*?

(1) $m\angle ABD = m\angle DBC$

(2) $\frac{1}{2}(m\angle ABC) = m\angle ABD$

(3) $2(m\angle DBC) = m\angle ABC$

(4) $2(m\angle ABC) = m\angle CBD$

7 What is the length of the line segment whose endpoints are $(1,-4)$ and $(9,2)$?

(1) 5   (3) 10

(2) $2\sqrt{17}$ (4) $2\sqrt{26}$

8 What is the image of the point $(2,-3)$ after the transformation $r_{y\text{-axis}}$?

(1) $(2,3)$ (3) $(-2,3)$

(2) $(-2,-3)$ (4) $(-3,2)$

9 In the diagram below, lines n and m are cut by transversals p and q.
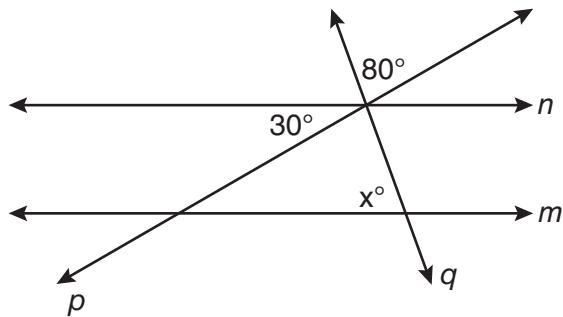
Which value of x would make lines n and m parallel?

(1) 110   (3) 70

(2) 80   (4) 50

10 What is an equation of the circle with a radius of 5 and center at $(1,-4)$?

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

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

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

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

11 In the diagram below of $\triangle BCD$, side $\overline{DB}$ is extended to point A.
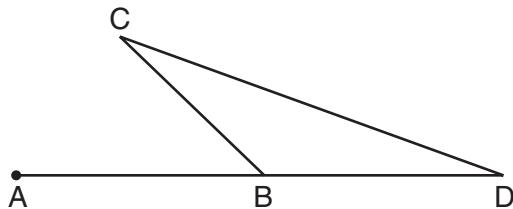
Which statement must be true?

(1) $m\angle C > m\angle D$ (3) $m\angle ABC > m\angle C$

(2) $m\angle ABC < m\angle D$ (4) $m\angle ABC > m\angle C + m\angle D$

12 Which equation represents the line parallel to the line whose equation is $4x + 2y = 14$ and passing through the point $(2,2)$?

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

(2) $y = -2x + 6$ (4) $y = \frac{1}{2}x + 1$

13 The coordinates of point A are $(-3a,4b)$. If point A' is the image of point A reflected over the line $y = x$, the coordinates of A' are

(1) $(4b,-3a)$ (3) $(-3a,-4b)$

(2) $(3a,4b)$ (4) $(-4b,-3a)$

14 As shown in the diagram below, $\overline{AC}$ bisects $\angle BAD$ and $\angle B \cong \angle D$.

B   D

C

A
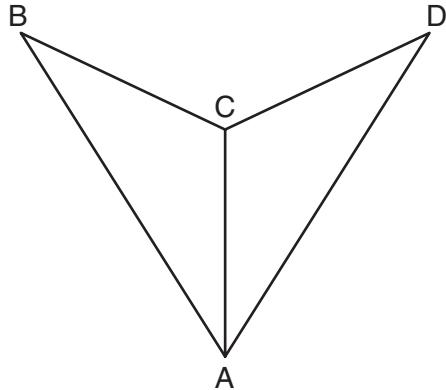
Which method could be used to prove $\triangle ABC \cong \triangle ADC$?

(1) SSS   (3) SAS

(2) AAA   (4) AAS

15 Segment AB is the diameter of circle M. The coordinates of A are $(-4,3)$. The coordinates of M are $(1,5)$. What are the coordinates of B?

(1) $(6,7)$ (3) $(-3,8)$

(2) $(5,8)$ (4) $(-5,2)$

16 In the diagram below, $\overleftrightarrow{AB}$ is perpendicular to plane *AEFG*.
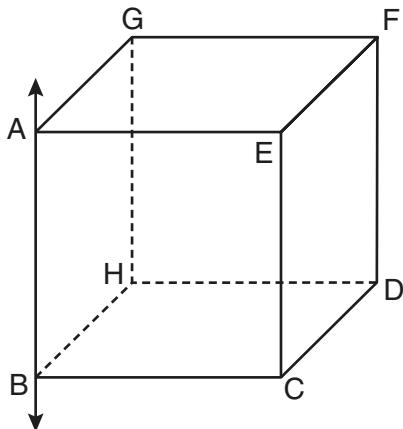
Which plane must be perpendicular to plane *AEFG*?

(1) *ABCE*   (3) *CDFE*

(2) *BCDH*   (4) *HDFG*

17 How many points are both 4 units from the origin and also 2 units from the line $y = 4$?

(1) 1   (3) 3

(2) 2   (4) 4

18 When solved graphically, what is the solution to the following system of equations?

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

(1) (1,4)   (3) (1,3) and (4,6)

(2) (4,6)   (4) (3,1) and (6,4)

19 Triangle *PQR* has angles in the ratio of 2:3:5. Which type of triangle is $\triangle PQR$?

(1) acute   (3) obtuse

(2) isosceles   (4) right

20 Plane $\mathcal{A}$ is parallel to plane $\mathcal{B}$. Plane C intersects plane $\mathcal{A}$ in line m and intersects plane $\mathcal{B}$ in line n. Lines m and n are

(1) intersecting   (3) perpendicular

(2) parallel   (4) skew

21 The diagonals of a quadrilateral are congruent but do *not* bisect each other. This quadrilateral is

(1) an isosceles trapezoid   (3) a rectangle

(2) a parallelogram   (4) a rhombus

22 What is the slope of a line perpendicular to the line represented by the equation $x + 2y = 3$?

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

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

23 A packing carton in the shape of a triangular prism is shown in the diagram below.
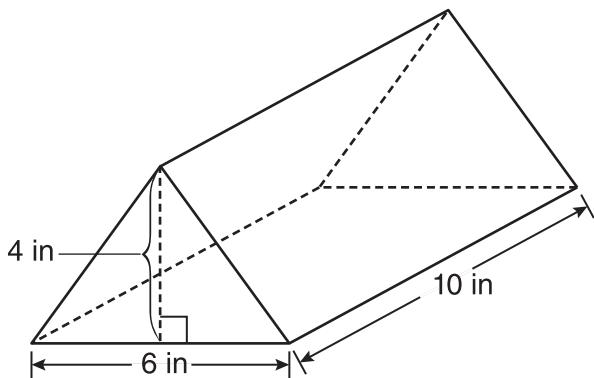
What is the volume, in cubic inches, of this carton?

(1) 20   (3) 120

(2) 60   (4) 240

24 In the diagram below of circle O, diameter $\overline{AOB}$ is perpendicular to chord $\overline{CD}$ at point E, $OA = 6$, and $OE = 2$.
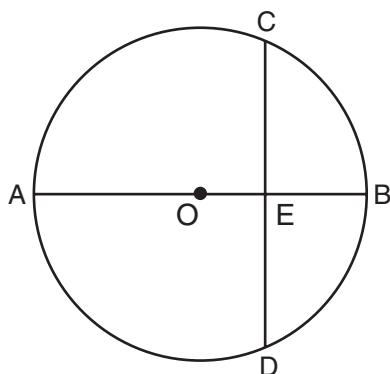
What is the length of $\overline{CE}$?

(1) $4\sqrt{3}$ (3) $8\sqrt{2}$

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

25 What is the measure of each interior angle of a regular hexagon?

(1) 60°   (3) 135°

(2) 120°   (4) 270°

26 Which equation represents the perpendicular bisector of $\overline{AB}$ whose endpoints are $A(8,2)$ and $B(0,6)$?

(1) $y = 2x - 4$ (3) $y = -\frac{1}{2}x + 6$

(2) $y = -\frac{1}{2}x + 2$ (4) $y = 2x - 12$

27 As shown in the diagram below, a kite needs a vertical and a horizontal support bar attached at opposite corners. The upper edges of the kite are 7 inches, the side edges are x inches, and the vertical support bar is $(x + 1)$ inches.
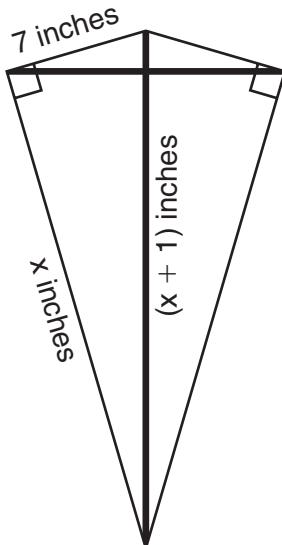
What is the measure, in inches, of the vertical support bar?

(1) 23   (3) 25

(2) 24   (4) 26

28 Given three distinct quadrilaterals, a square, a rectangle, and a rhombus, which quadrilaterals must have perpendicular diagonals?

(1) the rhombus, only

(2) the rectangle and the square

(3) the rhombus and the square

(4) the rectangle, the rhombus, and the square

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 In the diagram below, trapezoid $ABCD$, with bases $\overline{AB}$ and $\overline{DC}$, is inscribed in circle O, with diameter $\overline{DC}$. If $m\widehat{AB} = 80$, find $m\widehat{BC}$.
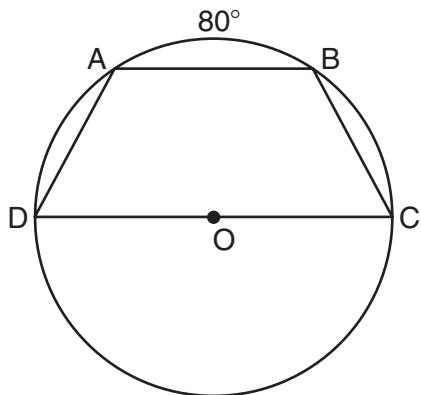
30 On the diagram of $\triangle ABC$ shown below, use a compass and straightedge to construct the perpendicular bisector of $\overline{AC}$. [Leave all construction marks.]

A ———————————————————— B

C
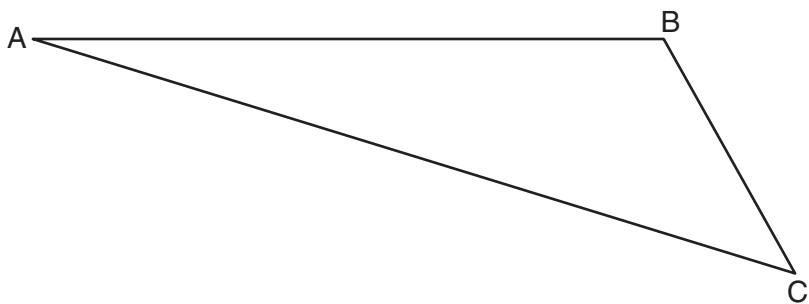
31 A sphere has a diameter of 18 meters. Find the volume of the sphere, in cubic meters, in terms of π.

32 Write an equation of the circle graphed in the diagram below.
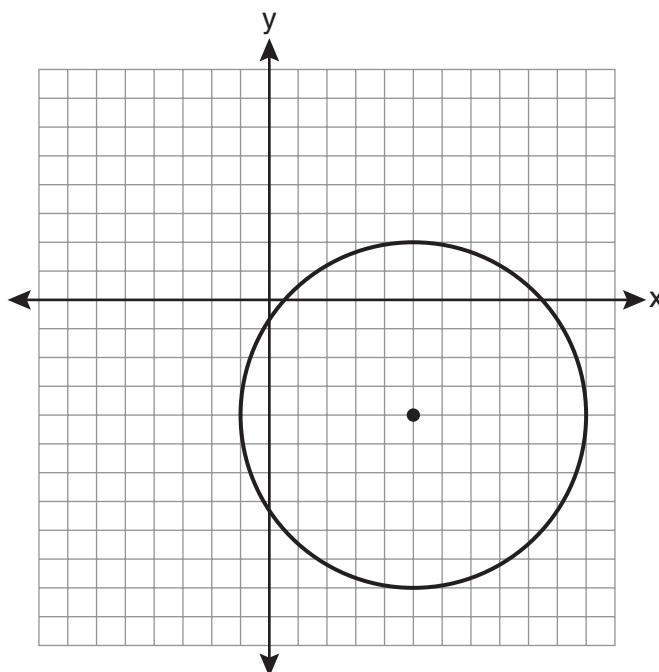
33 The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. Prove that $\triangle ABC$ is similar to $\triangle ADE$.
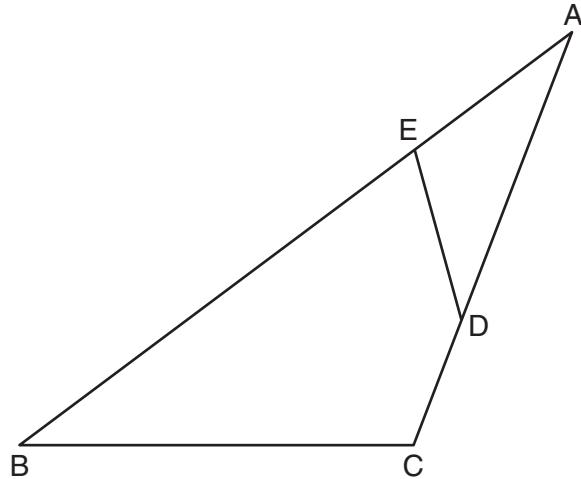
34 Triangle ABC has vertices $A(3,3)$, $B(7,9)$, and $C(11,3)$. Determine the point of intersection of the medians, and state its coordinates. [The use of the set of axes below is optional.]
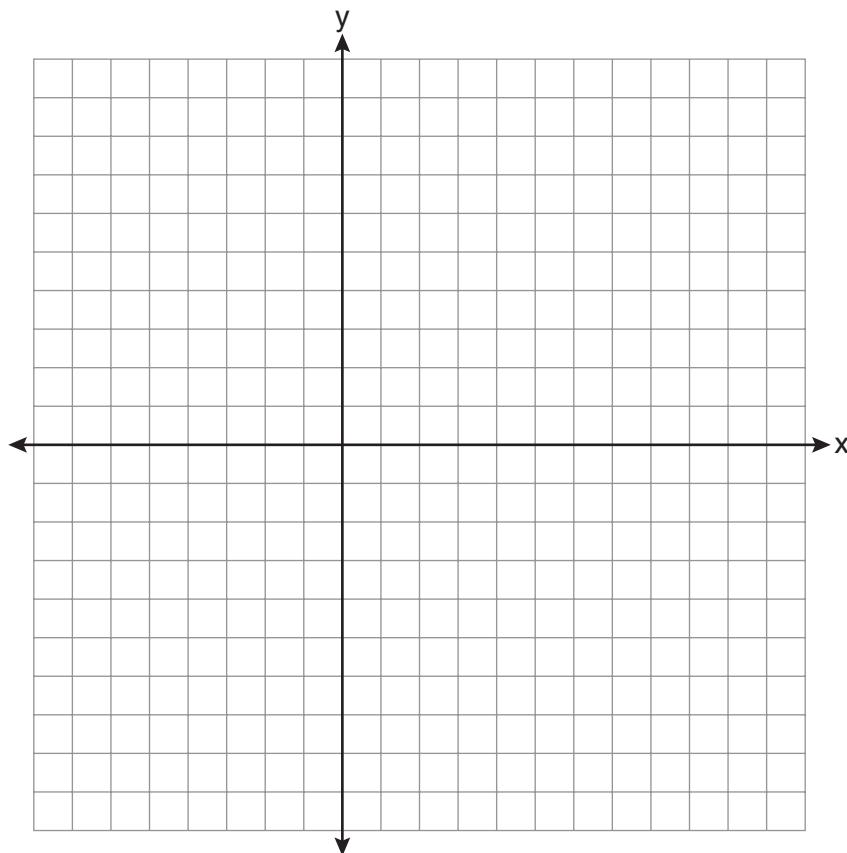
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [12]

35 In the diagram below of $\triangle GJK$, H is a point on $\overline{GJ}$, $\overline{HJ} \cong \overline{JK}$, m$\angle G$ = 28, and m$\angle GJK$ = 70. Determine whether $\triangle GHK$ is an isosceles triangle and justify your answer.
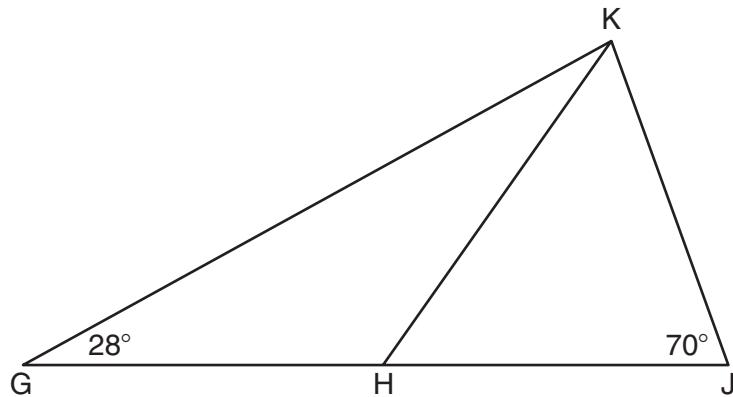
36 As shown on the set of axes below, $\triangle GHS$ has vertices $G(3,1)$, $H(5,3)$, and $S(1,4)$. Graph and state the coordinates of $\triangle G''H''S''$, the image of $\triangle GHS$ after the transformation $T_{-3,1} \circ D_2$.
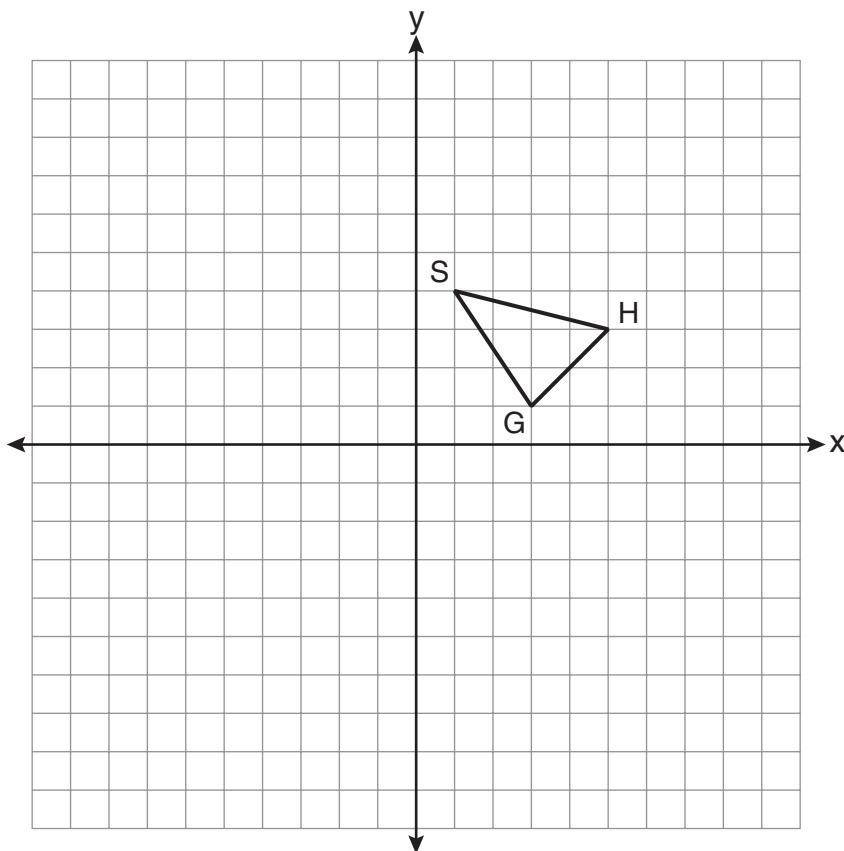
37 In the diagram below, $\triangle ABC \sim \triangle DEF$, $DE = 4$, $AB = x$, $AC = x + 2$, and $DF = x + 6$. Determine the length of $\overline{AB}$. [Only an algebraic solution can receive full credit.]
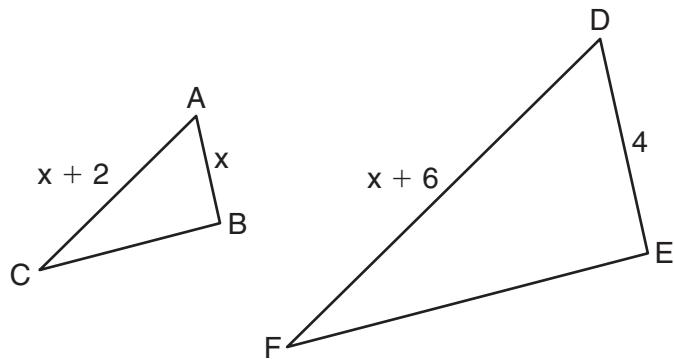
Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. A correct numerical answer with no work shown will receive only 1 credit. The answer should be written in pen. [6]

38 Given: $\triangle ABC$ with vertices $A(-6,-2)$, $B(2,8)$, and $C(6,-2)$

$\overline{AB}$ has midpoint D, $\overline{BC}$ has midpoint E, and $\overline{AC}$ has midpoint F

Prove: $ADEF$ is a parallelogram

$ADEF$ is *not* a rhombus

[The use of the grid below is optional.]
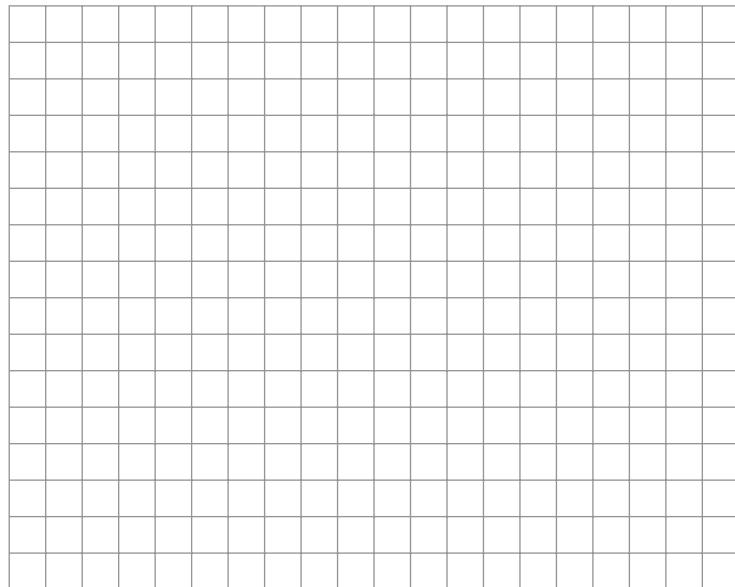
Reference Sheet

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	$SA = 4\pi r^2$
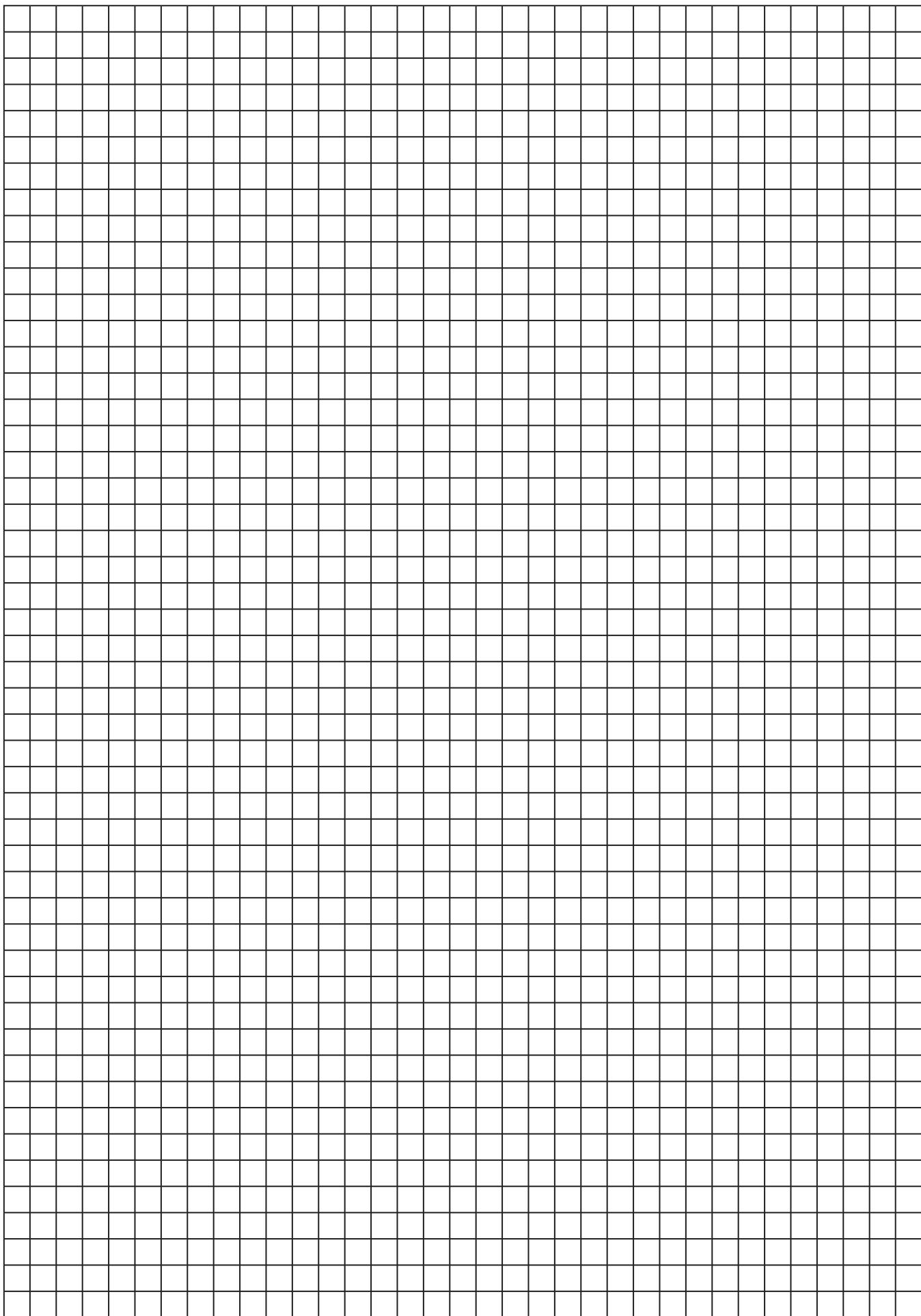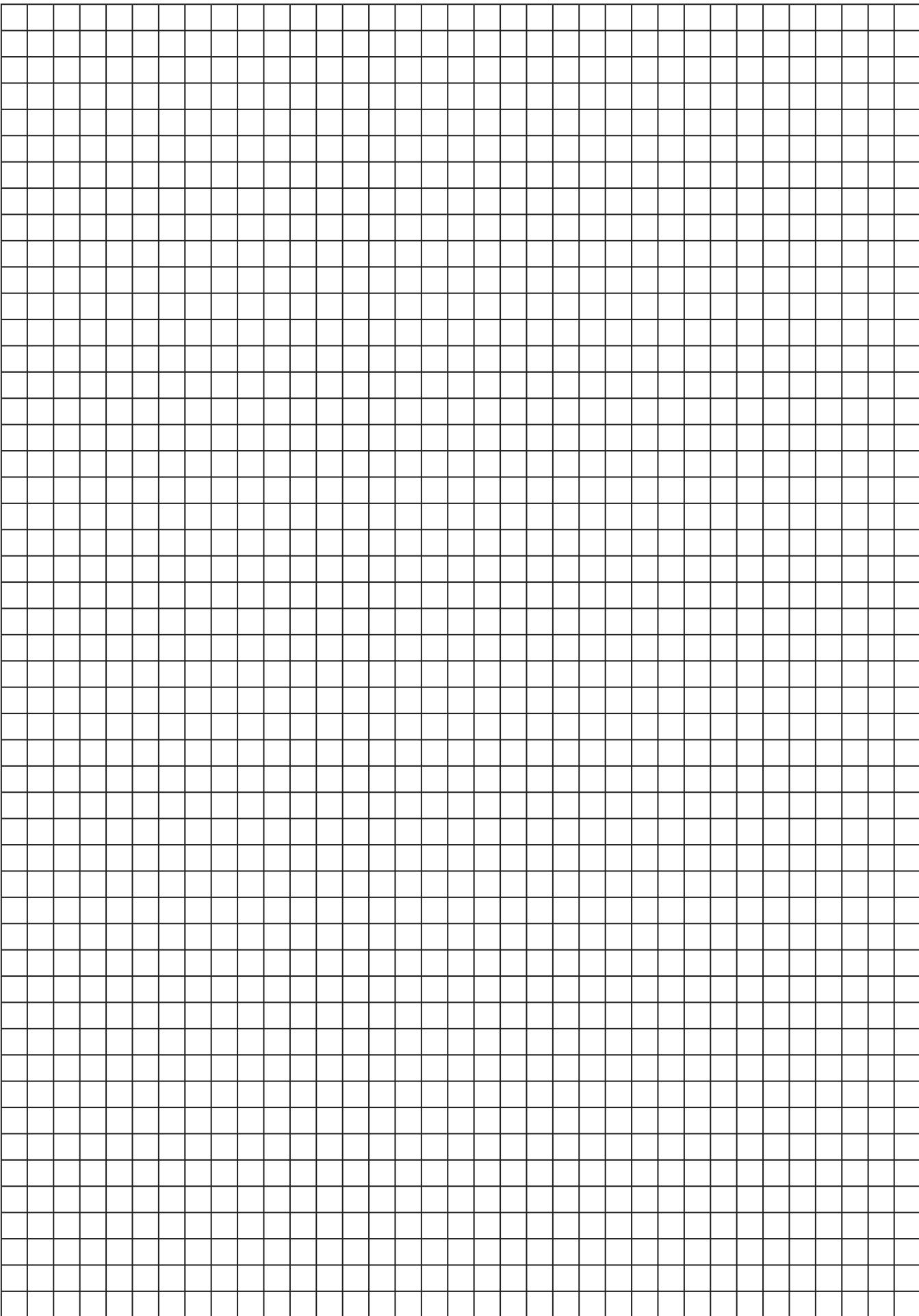
GEOMETRY

Wednesday, August 17, 2011—8:30 to 11:30 a.m., only

ANSWER SHEET

Student . . . .   **Sex:** ☐ **Male**   ☐ **Female**   **Grade** . . . . . .

Teacher . . . .   **School** . . . .

Your answers to Part I should be recorded on this answer sheet.

Part I

Answer all 28 questions in this part.

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

Your answers for Parts II, III, and IV should be written in the test booklet.

The declaration below must be signed when you have completed the examination.

I do hereby affirm, at the close of this examination, that I had no unlawful knowledge of the questions or answers prior to the examination and that I have neither given nor received assistance in answering any of the questions during the examination.

_____

Signature

Tear Here

Tear Here

Tear Here

GEOMETRY

GEOMETRY			
Question	Maximum Credit	Credits Earned	Rater's/Scorer's Initials
Part I 1–28	56		
Part II 29	2		
30	2		
31	2		
32	2		
33	2		
34	2		
Part III 35	4		
36	4		
37	4		
Part IV 38	6		
Maximum Total	86		

Total Raw Score   Checked by   Scale Score
(from conversion chart)

GEOMETRY

FOR TEACHERS ONLY

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Wednesday, August 17, 2011 – 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 rating the open-ended questions, you may make check marks in the exam booklet to indicate student errors. If the students were given scannable answer sheets for the multiple-choice questions, 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 back of the student's detachable answer sheet, raters must enter their initials in the boxes next to the questions they have scored and also write their name in the box under the heading "Rater's/Scorer's Name."

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 detachable 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, August 17, 2011. 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 detachable 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)	4	(8)	2	(15)	1	(22)	2
(2)	2	(9)	3	(16)	1	(23)	3
(3)	3	(10)	4	(17)	2	(24)	4
(4)	3	(11)	3	(18)	3	(25)	2
(5)	4	(12)	2	(19)	4	(26)	1
(6)	4	(13)	1	(20)	2	(27)	3
(7)	3	(14)	4	(21)	1	(28)	3

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 State 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 two credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(29)   **[2]** 50, and appropriate work is shown, such as a labeled diagram.

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

<p align="center">or</p>

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

<p align="center">or</p>

        [1] $2x + 80 = 180$ or an equivalent equation is written, but no further correct work is shown.

<p align="center">or</p>

        [1] 50, 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]** A correct construction is drawn showing all appropriate arcs, and the perpendicular bisector is correctly drawn.

        [1] A correct construction is drawn showing all appropriate arcs, but the perpendicular bisector of $\overline{AB}$ or $\overline{BC}$ is drawn.

<p align="center">or</p>

        [1] A correct construction is drawn showing all appropriate arcs, but the perpendicular bisector is not drawn.

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

<p align="center">or</p>

        [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]** 972π, and appropriate work is shown.

      [1] Appropriate work is shown, but one computational error is made, but an appropriate answer is written in terms of π.

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

      [1] Appropriate work is shown, but one conceptual error is made, but an appropriate answer is written in terms of π.

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

      [1] Appropriate work is shown, but the answer is not written in terms of π.

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

      [1] 972π, 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]** $(x - 5)^2 + (y + 4)^2 = 36$.

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

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

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

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

      [1] Center of (5,–4) and radius of 6 are stated, but no further correct 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 complete and correct proof that includes a conclusion is written.

　　　　　[1] Only one correct statement and reason are written.

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

　　　　　[1] One conceptual error is made.

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

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

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

(34)　　　**[2]** (7,5), and appropriate work is shown, such as locating the centroid on the vertical median or graphing at least two medians.

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

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

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

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

　　　　　[1] One or two medians are graphed correctly and the median is located, but the coordinates are not stated or are stated incorrectly.

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

　　　　　[1] (7,5), but no work is shown.

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

Part III

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

(35)   **[4]** The triangle is not isosceles, and an appropriate justification is given, such as a correctly labeled diagram.

[3] Appropriate work is shown, but one computational error is made, but an appropriate determination is made, and an appropriate justification is given.

[2] Appropriate work is shown, but two or more computational errors are made, but an appropriate determination is made, and an appropriate justification is given.

or

[2] Appropriate work is shown, but one conceptual error is made, but an appropriate determination is made, and an appropriate justification is given.

or

[2] The correct measures of $\angle JHK$ or $\angle JKH$ and $\angle GKH$ or $\angle GHK$ are found, but no determination is made.

[1] Appropriate work is shown, but one conceptual error and one computational error are made, but an appropriate determination is made, and an appropriate justification is given.

or

[1] Appropriate work is shown to find the correct measure of $\angle JHK$ or $\angle JKH$, but no further correct work is shown.

[0] Indicates the triangle is not isosceles, 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.

(36)   **[4]** $G''(3,3)$, $H''(7,7)$, and $S''(-1,9)$ are graphed, stated, and labeled correctly, and appropriate work is shown.

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

or

[3] Appropriate work is shown to find $G''(3,3)$, $H''(7,7)$, and $S''(-1,9)$, but no graph is drawn.

or

[3] $\triangle G''H''S''$ 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 graphed, stated, and labeled.

or

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

or

[2] The dilation is performed correctly, the image is graphed and labeled correctly, and the coordinates are labeled and stated correctly, 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 graphed, stated, and labeled.

or

[1] Appropriate work is shown to find $(3,3)$, $(7,7)$, and $(-1,9)$, but the points are not labeled, and no graph is drawn.

or

[1] Appropriate work is shown to find $G'(6,2)$, $H'(10,6)$, and $S'(2,8)$, but no further correct work is shown.

or

[1] The dilation is graphed and labeled correctly, but no further correct work is shown.

or

[1] $G''(3,3)$, $H''(7,7)$, and $S''(-1,9)$, but no work is shown, and no graph is drawn.

[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]** 2, and appropriate algebraic work is shown.

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

or

[3] Appropriate work is shown, but the negative root is included in the solution.

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

or

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

or

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

or

[2] Work is shown to find 2, 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.

or

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

or

[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.

Part IV

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

(38)   **[6]** Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, and an appropriate concluding statement is made.

        [5] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but one computational or graphing error is made.

<p align="center">or</p>

        [5] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but the concluding statement is missing or is incorrect.

        [4] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but two or more computational or graphing errors are made.

<p align="center">or</p>

        [4] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but one conceptual error is made.

        [3] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but two or more computational or graphing errors are made, and the concluding statement is missing or is incorrect.

<p align="center">or</p>

        [3] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but one conceptual error and one computational or graphing error are made.

<p align="center">or</p>

        [3] Appropriate work is shown to prove *ADEF* is a parallelogram, but no further correct work is shown.

<p align="center">or</p>

        [3] Appropriate work is shown to prove *ADEF* is not a rhombus, but no further correct work is shown.

        [2] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but two conceptual errors are made.

<p align="center">or</p>

        [2] Appropriate work is shown to prove $\overline{DE} \parallel \overline{AF}$ and $\overline{AD} \parallel \overline{FE}$, but no further correct work is shown.

<p align="center">or</p>

[2] Appropriate work is shown to prove that $\overline{DF}$ and $\overline{AE}$ bisect each other, but no further correct work is shown.

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

[2] Appropriate work is shown to prove that $\overline{DF}$ is not perpendicular to $\overline{AE}$, but no further correct work is shown.

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

[2] Appropriate work is shown to find the lengths of all four sides, but no further correct work is shown.

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

[2] Appropriate work is shown to prove one pair of opposite sides are both congruent and parallel, but no further correct work is shown.

[1] Appropriate work is shown to find the midpoints of $\overline{DF}$ and $\overline{AE}$, but no further correct work is shown.

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

[1] Appropriate work is shown to find all four slopes, but no further correct work is shown.

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

[1] Midpoints *D*, *E*, and *F* are found, but no further correct 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	16, 20, 23, 31
Constructions	6, 30
Locus	17, 34
Informal and Formal Proofs	1, 2, 3, 5, 9, 11, 14, 19, 21, 24, 25, 27, 28, 29, 33, 35, 37
Transformational Geometry	4, 8, 13, 36
Coordinate Geometry	7, 10, 12, 15, 18, 22, 26, 32, 38

Regents Examination in Geometry

August 2011

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

The *Chart for Determining the Final Examination Score for the August 2011 Regents Examination in Geometry* will be posted on the Department's web site at: http://www.p12.nysed.gov/apda/ on Wednesday, August 17, 2011. Conversion charts provided for previous administrations of the Geometry 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.

University of the State of New York
State Education Department

Regents Examination in Geometry
August 2011

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

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

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 "Final 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.