The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Thursday, January 24, 2013 — 9:15 a.m. to 12:15 p.m., only

Student Name:_____

School Name: _____

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

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. Record 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.

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

Part I

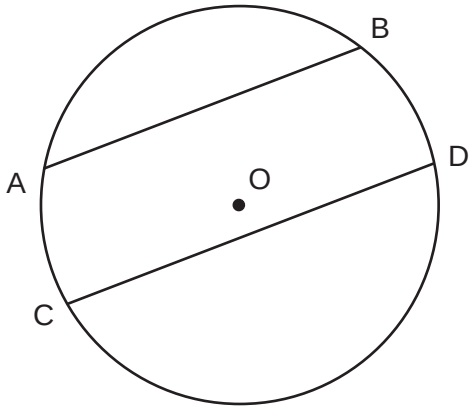
Answer all 28 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [56]

Use this space for computations.

1 If $\triangle MNP \cong \triangle VWX$ and $\overline{PM}$ is the shortest side of $\triangle MNP$, what is the shortest side of $\triangle VWX$?

(1) $\overline{XV}$
(2) $\overline{WX}$
(3) $\overline{VW}$
(4) $\overline{NP}$

2 In circle O shown in the diagram below, chords $\overline{AB}$ and $\overline{CD}$ are parallel.

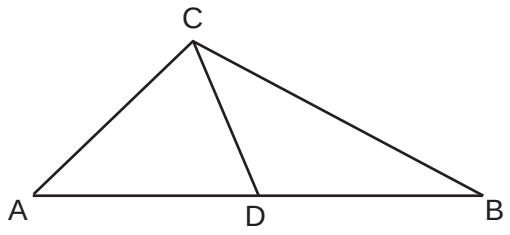


If $\text{m}\overset{\frown}{AB} = 104$ and $\text{m}\overset{\frown}{CD} = 168$, what is $\text{m}\overset{\frown}{BD}$?

(1) 38
(2) 44
(3) 88
(4) 96

Use this space for computations.

3 As shown in the diagram below, $\overline{CD}$ is a median of $\triangle ABC$.



Which statement is *always* true?

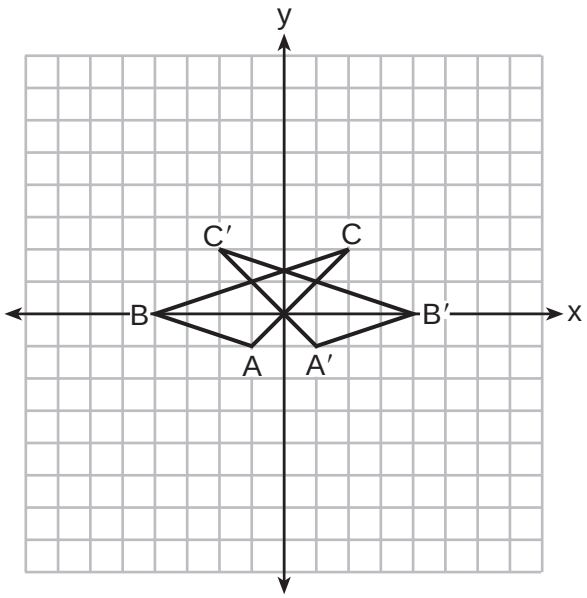
(1) $\overline{AD} \cong \overline{DB}$

(2) $\overline{AC} \cong \overline{AD}$

(3) $\angle ACD \cong \angle CDB$

(4) $\angle BCD \cong \angle ACD$

4 In the diagram below, under which transformation is $\triangle A'B'C'$ the image of $\triangle ABC$?



(1) D_2

(2) $r_{x\text{-axis}}$

(3) $r_{y\text{-axis}}$

(4) $(x,y) \rightarrow (x-2,y)$

Use this space for computations.

5 Line segment AB is a diameter of circle O whose center has coordinates (6,8). What are the coordinates of point B if the coordinates of point A are (4,2)?

(1) (1,3)
(2) (5,5)
(3) (8,14)
(4) (10,10)

6 Plane $\mathcal{A}$ and plane $\mathcal{B}$ are two distinct planes that are both perpendicular to line ℓ. Which statement about planes $\mathcal{A}$ and $\mathcal{B}$ is true?

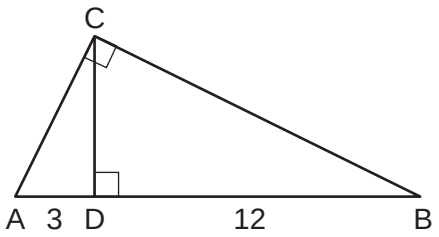
(1) Planes $\mathcal{A}$ and $\mathcal{B}$ have a common edge, which forms a line.
(2) Planes $\mathcal{A}$ and $\mathcal{B}$ are perpendicular to each other.
(3) Planes $\mathcal{A}$ and $\mathcal{B}$ intersect each other at exactly one point.
(4) Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel to each other.

7 Triangle ABC is similar to triangle DEF. The lengths of the sides of $\triangle ABC$ are 5, 8, and 11. What is the length of the shortest side of $\triangle DEF$ if its perimeter is 60?

(1) 10
(2) 12.5
(3) 20
(4) 27.5

Use this space for computations.

8 In the diagram below of right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.



If $AD = 3$ and $DB = 12$, what is the length of altitude $\overline{CD}$?

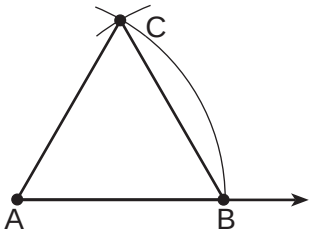
(1) 6

(2) $6\sqrt{5}$

(3) 3

(4) $3\sqrt{5}$

9 The diagram below shows the construction of an equilateral triangle.



Which statement justifies this construction?

(1) $\angle A + \angle B + \angle C = 180$

(2) $m\angle A = m\angle B = m\angle C$

(3) $AB = AC = BC$

(4) $AB + BC > AC$

10 What is the slope of the line perpendicular to the line represented by the equation $2x + 4y = 12$?

(1) –2

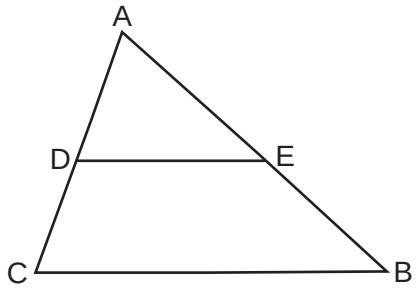
(2) 2

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

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

Use this space for computations.

11 Triangle ABC is shown in the diagram below.



If $\overline{DE}$ joins the midpoints of $\overline{ADC}$ and $\overline{AEB}$, which statement is *not* true?

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

(2) $\overline{DE} \parallel \overline{CB}$

(3) $\frac{AD}{DC} = \frac{DE}{CB}$

(4) $\triangle ABC \sim \triangle AED$

12 The equations $x^2 + y^2 = 25$ and $y = 5$ are graphed on a set of axes. What is the solution of this system?

(1) (0,0)

(2) (5,0)

(3) (0,5)

(4) (5,5)

13 Square $ABCD$ has vertices $A(-2,-3)$, $B(4,-1)$, $C(2,5)$, and $D(-4,3)$. What is the length of a side of the square?

(1) $2\sqrt{5}$

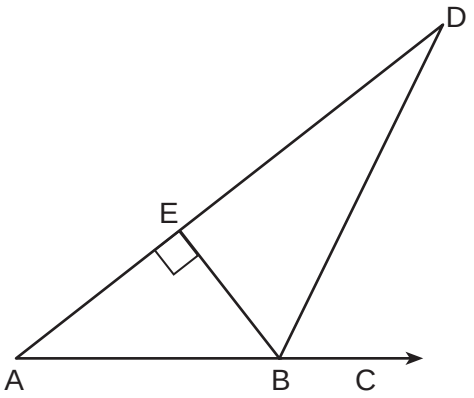
(2) $2\sqrt{10}$

(3) $4\sqrt{5}$

(4) $10\sqrt{2}$

Use this space for computations.

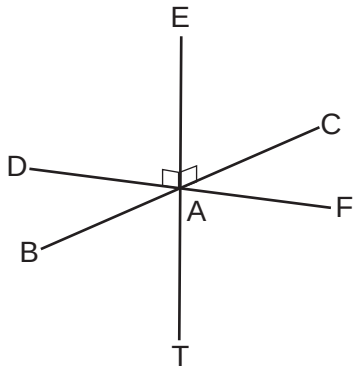
14 The diagram below shows $\triangle ABD$, with $\overrightarrow{ABC}$, $\overline{BE} \perp \overline{AD}$, and $\angle EBD \cong \angle CBD$.



If $m\angle ABE = 52$, what is $m\angle D$?

(1) 26
(2) 38
(3) 52
(4) 64

15 As shown in the diagram below, $\overline{FD}$ and $\overline{CB}$ intersect at point A and $\overline{ET}$ is perpendicular to both $\overline{FD}$ and $\overline{CB}$ at A.



Which statement is *not* true?

(1) $\overline{ET}$ is perpendicular to plane BAD.
(2) $\overline{ET}$ is perpendicular to plane FAB.
(3) $\overline{ET}$ is perpendicular to plane CAD.
(4) $\overline{ET}$ is perpendicular to plane BAT.

Use this space for computations.

16 Which set of numbers could *not* represent the lengths of the sides of a right triangle?

(1) $\{1,3,\sqrt{10}\}$

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

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

(4) $\{8,15,17\}$

17 How many points are 5 units from a line and also equidistant from two points on the line?

(1) 1

(2) 2

(3) 3

(4) 0

18 The equation of a circle is $(x - 2)^2 + (y + 5)^2 = 32$. What are the coordinates of the center of this circle and the length of its radius?

(1) $(-2,5)$ and 16

(2) $(2,-5)$ and 16

(3) $(-2,5)$ and $4\sqrt{2}$

(4) $(2,-5)$ and $4\sqrt{2}$

19 The equation of a line is $y = \frac{2}{3}x + 5$. What is an equation of the line that is perpendicular to the given line and that passes through the point $(4,2)$?

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

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

(3) $y = -\frac{3}{2}x + 7$

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

Use this space for computations.

20 Consider the relationship between the two statements below.

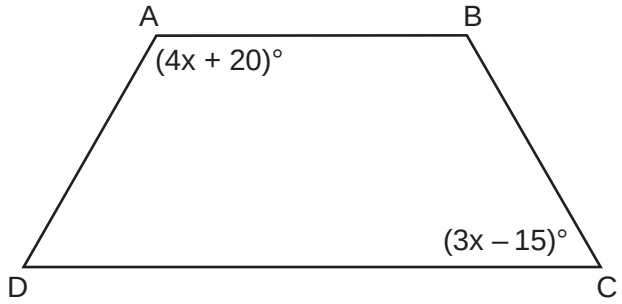
If $\sqrt{16 + 9} \neq 4 + 3$, then $5 \neq 4 + 3$.

If $\sqrt{16 + 9} = 4 + 3$, then $5 = 4 + 3$.

These statements are

(1) inverses
(2) converses
(3) contrapositives
(4) biconditionals

21 In the diagram of trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \cong \overline{BC}$, $m\angle A = 4x + 20$, and $m\angle C = 3x - 15$.

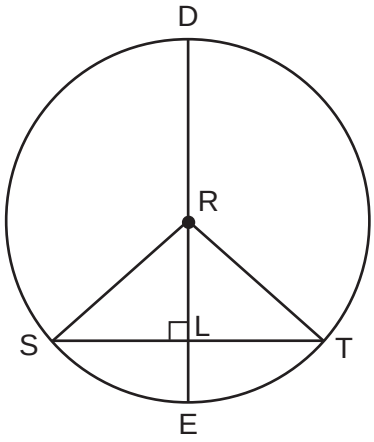


What is $m\angle D$?

(1) 25
(2) 35
(3) 60
(4) 90

Use this space for computations.

22 In circle R shown below, diameter $\overline{DE}$ is perpendicular to chord $\overline{ST}$ at point L.



Which statement is *not* always true?

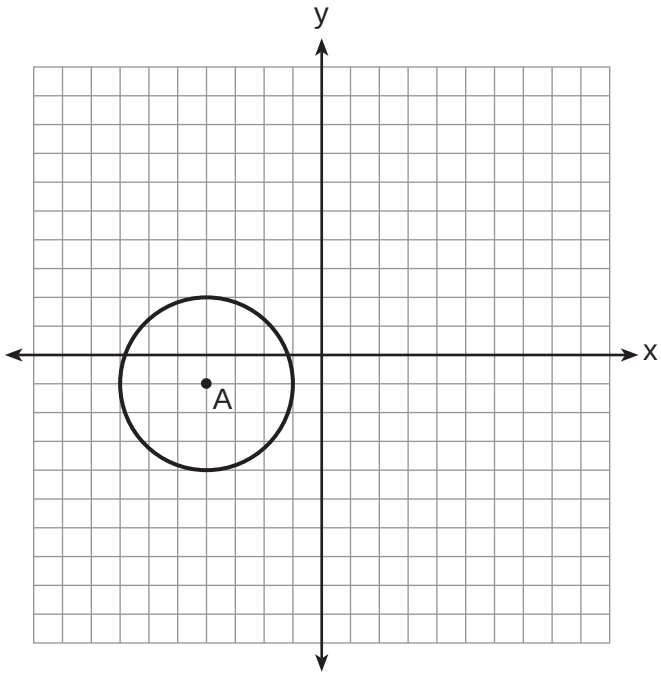
(1) $\overline{SL} \cong \overline{TL}$

(2) $RS = DR$

(3) $\overline{RL} \cong \overline{LE}$

(4) $(DL)(LE) = (SL)(LT)$

23 Which equation represents circle A shown in the diagram below?



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

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

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

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

Use this space for computations.

24 Which equation represents a line that is parallel to the line whose equation is $3x - 2y = 7$?

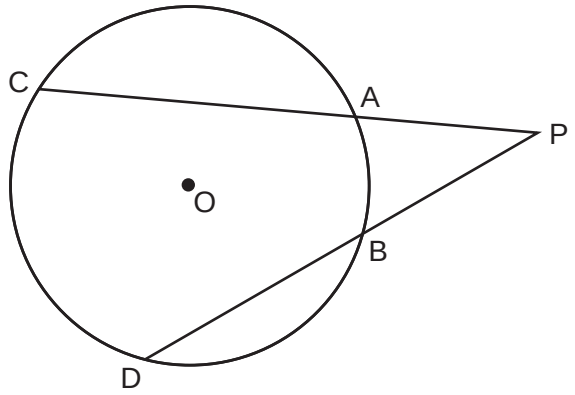
(1) $y = -\frac{3}{2}x + 5$

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

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

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

25 In the diagram below of circle O, $\overline{PAC}$ and $\overline{PBD}$ are secants.



If $\text{m}\overset{\frown}{CD} = 70$ and $\text{m}\overset{\frown}{AB} = 20$, what is the degree measure of $\angle P$?

(1) 25

(2) 35

(3) 45

(4) 50

26 The measure of an interior angle of a regular polygon is 120°. How many sides does the polygon have?

(1) 5

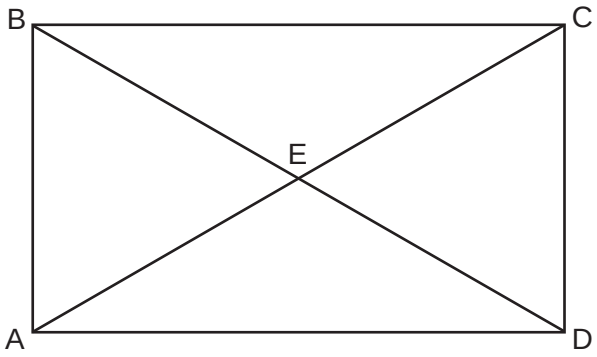
(2) 6

(3) 3

(4) 4

Use this space for computations.

27 As shown in the diagram of rectangle $ABCD$ below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



If $AE = x + 2$ and $BD = 4x - 16$, then the length of $\overline{AC}$ is

(1) 6 (3) 12

(2) 10 (4) 24

28 If the vertices of $\triangle ABC$ are $A(-2,4)$, $B(-2,8)$, and $C(-5,6)$, then $\triangle ABC$ is classified as

(1) right (3) isosceles

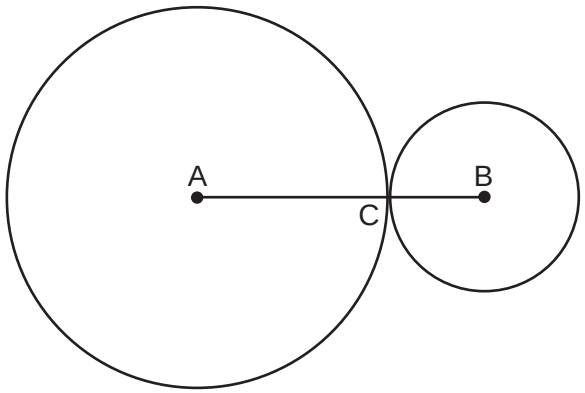
(2) scalene (4) equilateral

Part II

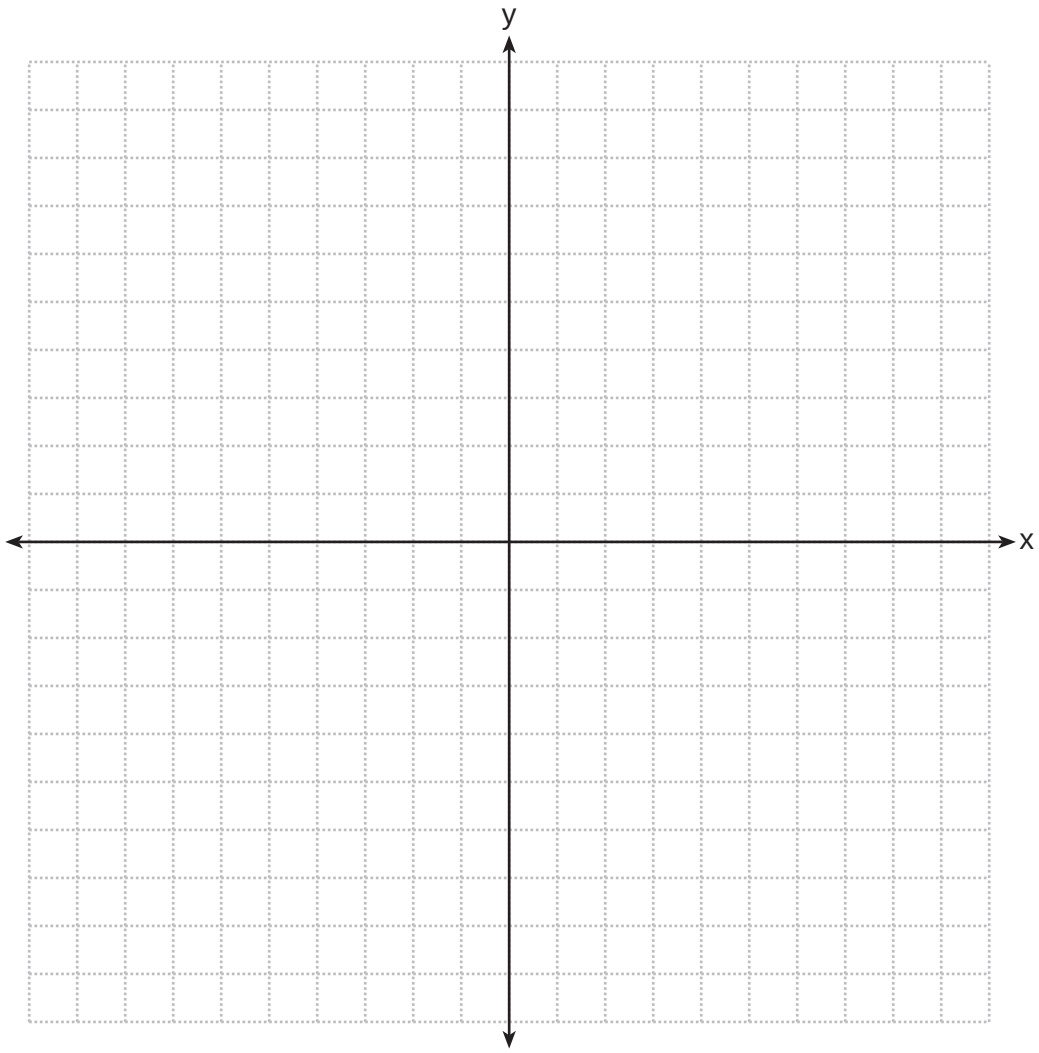
Answer all 6 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit.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

29 After the transformation $r_{y=x}$, the image of $\triangle ABC$ is $\triangle A'B'C'$. If $AB = 2x + 13$ and $A'B' = 9x - 8$, find the value of x.

30 In the diagram below, circles A and B are tangent at point C and $\overline{AB}$ is drawn. Sketch all common tangent lines.

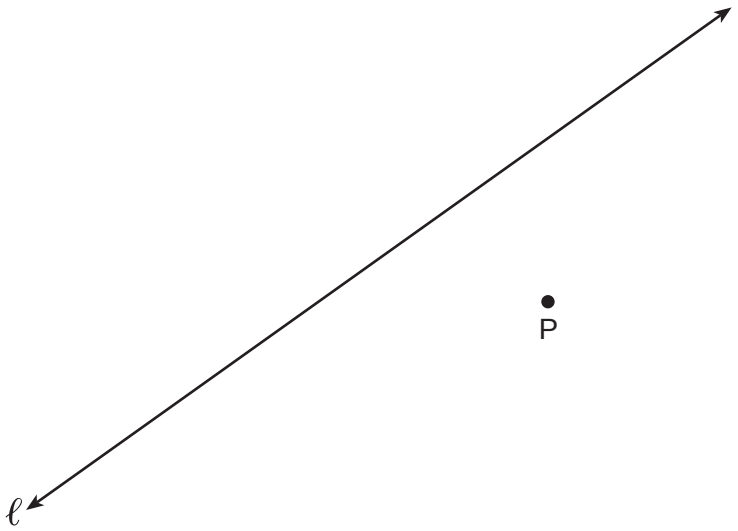


31 On the set of axes below, graph the locus of points 4 units from (0,1) and the locus of points 3 units from the origin. Label with an **X** *any* points that satisfy *both* conditions.

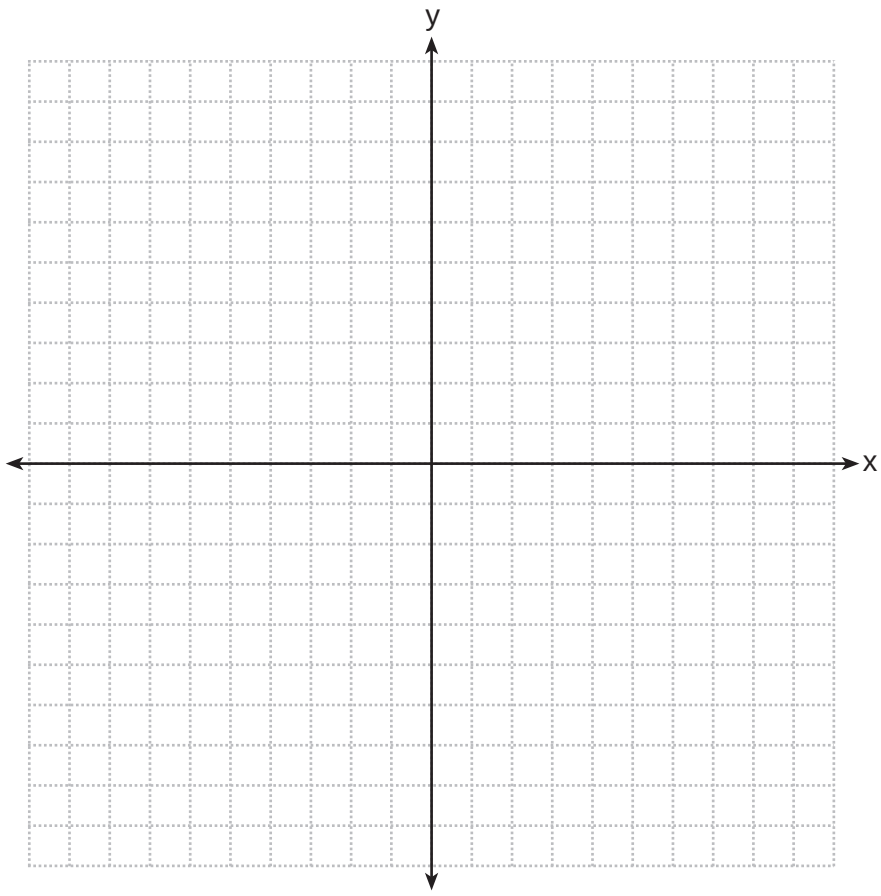


32 Write an equation of a circle whose center is $(-3,2)$ and whose diameter is 10.

33 Using a compass and straightedge, construct a line perpendicular to line ℓ through point P. [Leave all construction marks.]



34 Write an equation of the line that is the perpendicular bisector of the line segment having endpoints (3,−1) and (3,5). [The use of the grid below is optional.]



Part III

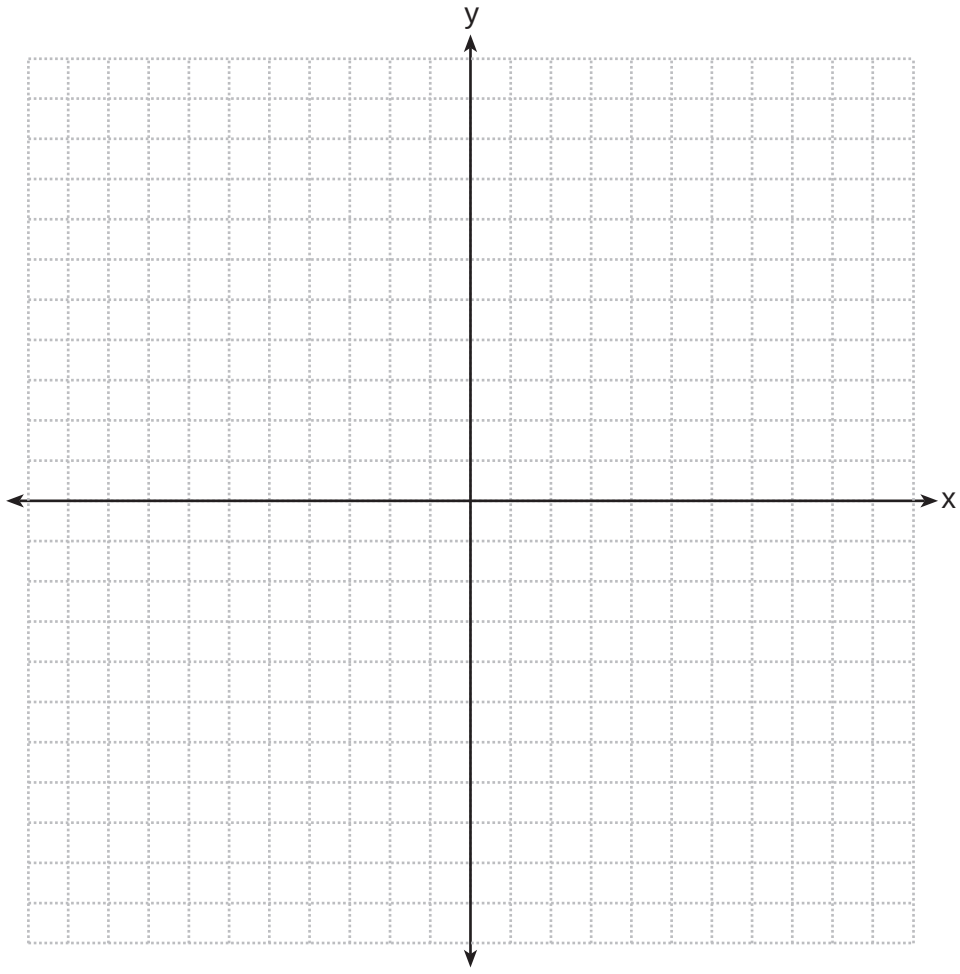
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit.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

35 A right circular cylinder with a height of 5 cm has a base with a diameter of 6 cm. Find the lateral area of the cylinder to the *nearest hundredth of a square centimeter*.

Find the volume of the cylinder to the *nearest hundredth of a cubic centimeter*.

36 Triangle ABC has vertices $A(5,1)$, $B(1,4)$, and $C(1,1)$.

State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$, following the composite transformation $T_{1,-1} \circ D_2$. [The use of the set of axes below is optional.]



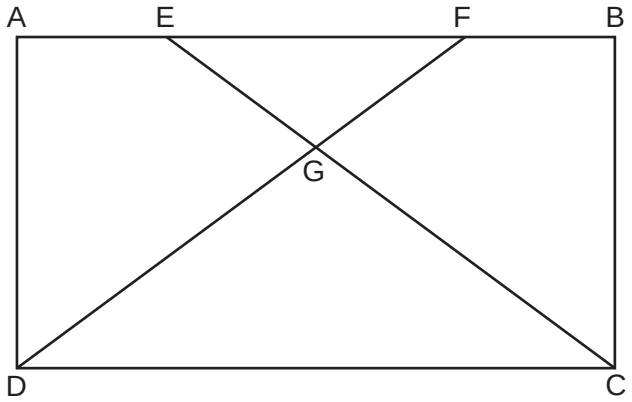
37 In $\triangle ABC$, $m\angle A = x^2 + 12$, $m\angle B = 11x + 5$, and $m\angle C = 13x - 17$. Determine the longest side of $\triangle ABC$.

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 The diagram below shows rectangle $ABCD$ with points E and F on side $\overline{AB}$. Segments CE and DF intersect at G, and $\angle ADG \cong \angle BCG$.

Prove that $\overline{AE} \cong \overline{BF}$.



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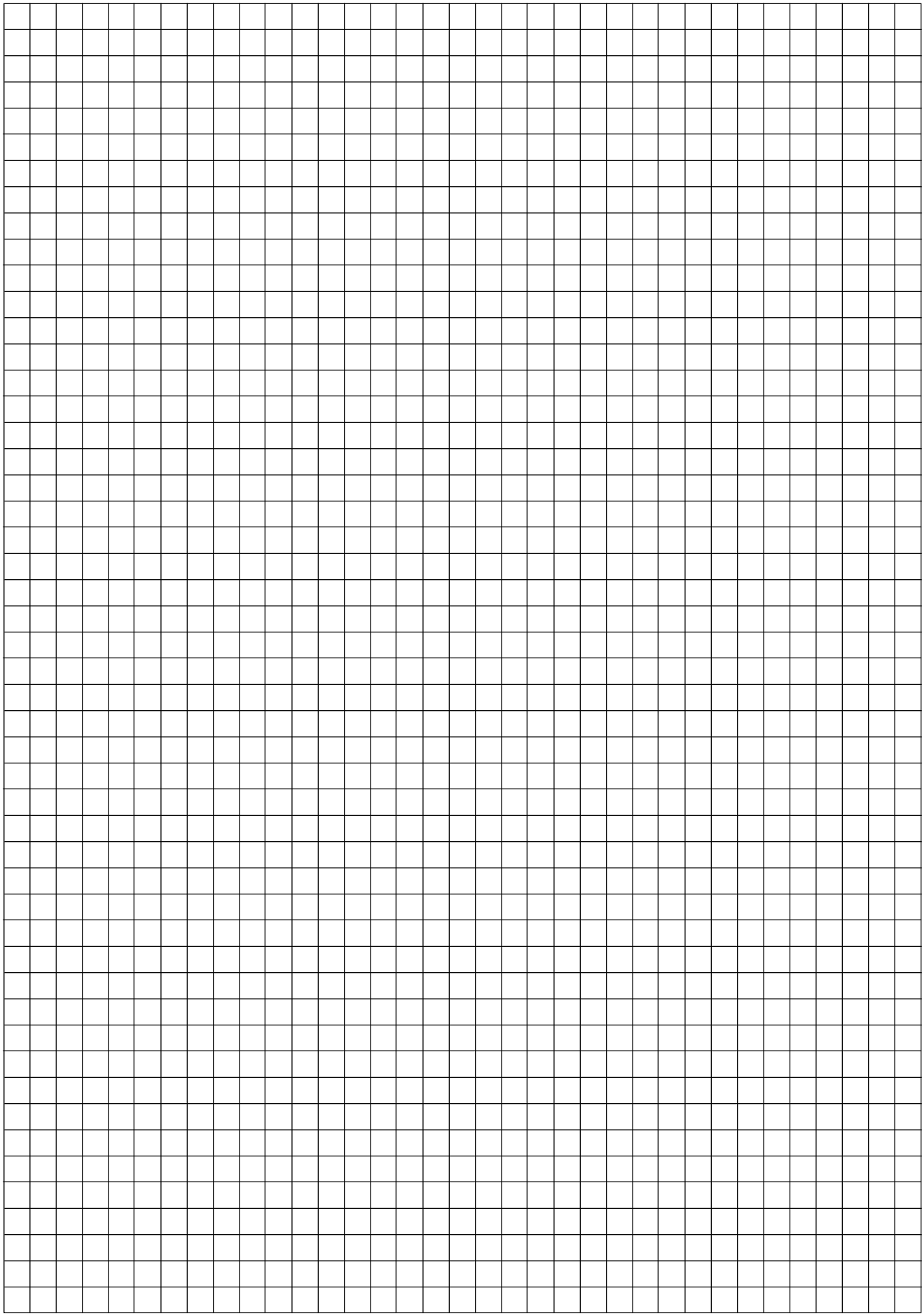
Scrap Graph Paper — This sheet will *not* be scored.



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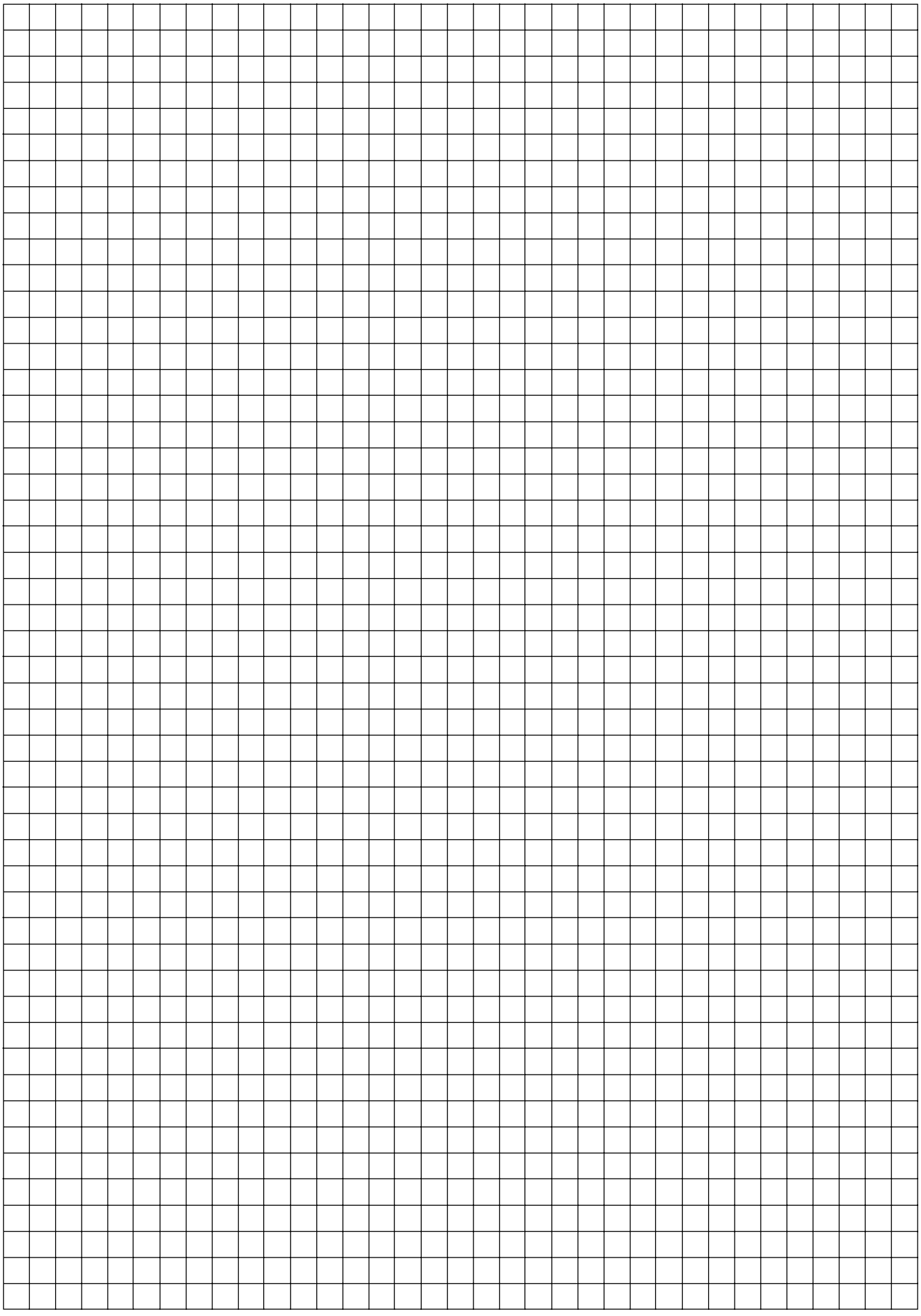

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GEOMETRY

FOR TEACHERS ONLY

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REGENTS HIGH SCHOOL EXAMINATION

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Thursday, January 24, 2013 — 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. 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/assessment/ on Thursday, January 24, 2013. Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score. The student's scale score should be entered in the box provided on the student's separate answer sheet. The scale score is the student's final examination score.

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

Part I

Allow a maximum of 56 credits, 2 credits for each of the following.

(1) 1	(8) 1	(15) 4	(22) . . . . . 3 . . . . .
(2) 2	(9) 3	(16) 2	(23) . . . . . 4 . . . . .
(3) 1	(10) 2	(17) 2	(24) . . . . . 3 . . . . .
(4) 3	(11) 3	(18) 4	(25) . . . . . 1 . . . . .
(5) 3	(12) 3	(19) 4	(26) . . . . . 2 . . . . .
(6) 4	(13) 2	(20) 1	(27) . . . . . 4 . . . . .
(7) 2	(14) 1	(21) 3	(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/assessment/ and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

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]** 3, and appropriate work is shown.

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

or

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

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.

(30) **[2]** All three common tangent lines are sketched correctly.

[1] Only one or two common tangent lines are sketched correctly.

or

[1] All three common tangent lines are sketched correctly, but additional tangent lines are also sketched.

[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]** Both loci are graphed correctly, and the point (0,–3) is labeled with an **X**.

[1] Both loci are graphed, but one graphing error is made, but appropriate points are labeled with an **X**.

or

[1] Both loci are graphed, but one conceptual error is made, but appropriate points are labeled with an **X**.

or

[1] Both loci are graphed correctly, but no points are labeled with an **X**.

or

[1] Both loci are graphed correctly, and (0,–3) is labeled with an **X**, but additional points are labeled with an **X**.

or

[1] Only one locus is graphed correctly, 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.

(32) **[2]** $(x + 3)^2 + (y - 2)^2 = 25$ or an equivalent equation.

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

or

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

[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]** $y = 2$.

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

or

[1] One conceptual error is made, such as writing the equation $x = 2$.

or

[1] The midpoint (3,2) is found, but no further correct work is shown.

or

[1] A slope of zero is stated for the perpendicular bisector line, 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.

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]** 94.25 and 141.37, and appropriate work is shown.

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

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

or

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

or

[2] Appropriate work is shown to find either 94.25 or 141.37, but no further correct work is shown.

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

or

[1] 94.25 and 141.37, 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]** $A''(11,1)$, $B''(3,7)$, and $C''(3,1)$.

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

or

[3] (11,1), (3,7) and (3,1) are stated, and appropriate work is shown, but the coordinates are not labeled or are labeled incorrectly.

or

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

[2] Appropriate work is shown, but one computational or graphing error is made, but appropriate coordinates are stated, but the coordinates are not labeled or are labeled incorrectly.

or

[2] Appropriate work is shown, but two or more computational or graphing errors are made, but appropriate coordinates for $A''B''C''$ are stated and labeled.

or

[2] Appropriate work is shown, but one conceptual error is made, such as performing a translation before the dilation, but appropriate coordinates for $A''B''C''$ are stated and labeled.

[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made, but appropriate coordinates for $A''B''C''$ are stated and labeled.

or

[1] Appropriate work is shown, but one conceptual error is made, but appropriate coordinates for $A''B''C''$ are stated, but the coordinates are not labeled or are labeled incorrectly.

or

[1] Appropriate work is shown, but one conceptual error is made, but appropriate coordinates for $A''B''C''$ are graphed and labeled, but the coordinates are not stated or are stated incorrectly.

or

[1] $A'(10,2)$, $B'(2,8)$, and $C'(2,2)$, but no further correct work is shown.

[0] (11,1), (3,7), and (3,1), 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]** $\overline{AC}$, and appropriate work is shown.

[3] Appropriate work is shown, but one computational or factoring error is made, but appropriate angles are found, and an appropriate side is stated.

or

[3] Appropriate work is shown to find $m\angle A = 48$, $m\angle B = 71$, and $m\angle C = 61$, but no side or an incorrect side is stated.

[2] Appropriate work is shown, but two or more computational or factoring errors are made, but appropriate angles are found, and an appropriate side is stated.

or

[2] Appropriate work is shown, but one conceptual error is made, but appropriate angles are found, and an appropriate side is stated.

or

[2] Appropriate work is shown to find $x = 6$, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational or factoring error are made, but appropriate angles are found, and an appropriate side is stated.

or

[1] A correct quadratic equation in standard form (set equal to 0) is written, but no further correct work is shown.

[0] $\overline{AC}$, 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.

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]** A complete and correct proof that includes a conclusion is written.

[5] 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.

[4] 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.

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

or

[3] A proof is written that shows $\triangle ADF \cong \triangle BCE$, but no further correct work is shown.

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

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

[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.

Map to Core Curriculum

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

Regents Examination in Geometry

January 2013

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

The *Chart for Determining the Final Examination Score for the January 2013 Regents Examination in Geometry* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Thursday, January 24, 2013. 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 – January 2013

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	**87**
74	**86**
73	**86**
72	**85**
71	**84**
70	**83**
69	**83**
68	**82**
67	**81**
66	**81**
65	**80**

Raw Score	Scale Score
64	**80**
63	**79**
62	**79**
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	**68**
44	**68**
43	**67**

Raw Score	Scale Score
42	**66**
41	**66**
40	**65**
39	**64**
38	**63**
37	**62**
36	**61**
35	**60**
34	**59**
33	**58**
32	**57**
31	**56**
30	**55**
29	**54**
28	**53**
27	**51**
26	**50**
25	**49**
24	**48**
23	**46**
22	**45**
21	**43**

Raw Score	Scale Score
20	**42**
19	**41**
18	**39**
17	**37**
16	**35**
15	**34**
14	**32**
13	**30**
12	**28**
11	**26**
10	**24**
9	**22**
8	**19**
7	**17**
6	**15**
5	**13**
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.