Network 603

GEOMETRY (Common Core) Practice Regents Exam

Page 2: Practice Regents Exam Blueprint

Pages 3 – 30: Full-length Geometry (Common Core) Practice Regents Exam, with graph paper and reference table

Pages 31 – 35: Scoring Key and Rating Guide

Page 36: Item Standards Alignment

This practice Regents exam was developed with the intention to provide more sample problems aligned to the new Common Core Geometry standards, while adhering to the blueprint of the new Common Core Geometry Regents exam as outlined in the Geometry Test Guide (available at https://www.engageny.org/resource/regents-exams-mathematics-geometry-test-guide). The allocation of points on the practice exam is in alignment with the released expected percentages in each standard domain and the content emphases, as detailed below:

Domain	Percent of Regents Exam	Percent of This Practice Exam
Congruence	27 – 34%	30.23%
Similarity, Right Triangles & Trigonometry	29 – 37%	30.23%
Circles	2 – 8%	6.98%
Expressing Geometric Properties with Equations	12 – 18%	16.28%
Geometric Measurement & Dimensions	2 – 8%	6.98%
Modeling with Geometry	8 – 15%	9.30%

Content Emphases	Percent of Regents Exam	Percent of This Practice Exam
Major Clusters	68 – 83%	72.09%
Supporting Clusters	4 – 14%	11.63%
Additional Clusters	12 – 24%	16.28%

The items on this practice Regents exam were designed in-house after analyzing the two sets of released NYSED official sample items (available at https://www.engageny.org/resource/regents-exams-mathematics-geometry-sample-items), as well as past Geometry, Math A, Math B, and Integrated Algebra Regents exams.

Please note that this practice exam was developed by Network 603 as a resource for teachers. It is *not* an official NYSED sample exam, has not been reviewed by the NYSED, and may not be representative of an actual Geometry Regents Exam.

Hope you find this resource helpful!

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Final Release: 5/14/15

Network 603 Geometry (Common Core) Practice Regents Exam Blueprint

Conceptual Category	Domain	Cluster	Standard	Cluster Emphasis	Points on Practice Exam	Q1	Type	Q2	Type	Q3	Type	% of Practice Exam	Total Domain %	Presence of Standard on NYSED Sample items (Spring 2014 and Fall 2014)
Geometry 100%	Congruence 27%-34%	A. Experiment with transformations in the plane	G-CO.1	Supporting	0							0.00	30.23	
			G-CO.2		2	2	MC					2.33		
			G-CO.3		0							0.00		Spring #2, Spring #8(b)
			G-CO.4		0							0.00		
			G-CO.5		4	2	MC	2	MC			4.65		Fall #8
		B. Understanding congruence in terms of rigid motions	G-CO.6	**Major**	6	4	SR4	2	MC			6.98		Fall #2
			G-CO.7		2	2	MC					2.33		
			G-CO.8		0							0.00		
		C. Prove geometric theorems	G-CO.9		2	2	MC					2.33		
			G-CO.10		4	2	SR2	2	MC			4.65		Spring #11, Fall #10
			G-CO.11		2	2	MC					2.33		
		D. Make geometric constructions	G-CO.12	Supporting	2	2	SR2					2.33		Fall #9
			G-CO.13		2	2	MC					2.33		Fall #12
	Similarity, Right Triangles & Trigonometry 29%-37%	**A. Understand similarity in terms of similarity transformations**	G-SRT.1a	**Major**	2	2	MC					2.33	30.23	Spring #3, Fall #3
			G-SRT.1b		2	2	MC					2.33		
			G-SRT.2		4	2	MC	2	SR2			4.65		Spring #6
			G-SRT.3		0							0.00		
		B. Prove theorems involving similarity	G-SRT.4		4	4	SR4					4.65		
			G-SRT.5		4	2	MC	2	SR2			4.65		Spring #8(a), Fall #5
		C. Define trigonometric ratios and solve problems involving right triangles	G-SRT.6		0							0.00		
			G-SRT.7		2	2	MC					2.33		Spring #7, Fall #7
			G-SRT.8		8	4	SR4	2	MC	2	MC	9.30		Spring #9, Fall #1, Fall #13
	Circles 2%-8%	A. Understand and apply theorems about circles	G-C.1	Additional	0							0.00	6.98	Spring #4
			G-C.2		4	2	SR2	2	MC			4.65		
			G-C.3		0							0.00		
		B. Find arc lengths and areas of sectors of circles	G-C.5		2	2	MC					2.33		Spring #10, Fall #4
	Expressing Geometric Properties with Equations 12%-18%	A. Translate between the geometric description and the equation for a conic section	G-GPE.1	Additional	2	2	MC					2.33	16.28	
		B. Use coordinates to prove simple geometric theorems algebraically	G-GPE.4	**Major**	6	6	ER					6.98		
			G-GPE.5		2	2	MC					2.33		Fall #11
			G-GPE.6		2	2	MC					2.33		Spring #1
			G-GPE.7		2	2	MC					2.33		
	Geometric Measurement & Dimensions 2%-8%	A. Explain volume formulas and use them to solve problems	G-GMD.1	Additional	2	2	SR2					2.33	6.98	Spring #5
			G-GMD.3		2	2	MC					2.33		
		B. Visualize relationships between two-dimensional and three-dimensional objects	G-GMD.4		2	2	MC					2.33		
	Modeling with Geometry 8%-15%	**A. Apply geometric concepts in modeling situations**	G-MG.1	**Major**	0							0.00	9.30	
			G-MG.2		6	6	ER					6.98		Spring #12, Fall #6
			G-MG.3		2	2	SR2					2.33		
					86							100.00	100.00	

	NYSED Target	Points on Practice Test	% of Practice Test
Major	68%-83%	62	72.09
Supporting	4%-14%	10	11.63
Additional	12%-24%	14	16.28
Total		86	100

Question Type	Count	Points
Multiple Choice (MC)	24	48
2-pt short response (SR2)	7	14
4-pt short response (SR4)	3	12
6-pt extended response (ER)	2	12
Total	36	86

Developed by Mike Miller, Network 603

Network 603

PRACTICE REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY (Common Core)

Practice Exam

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 36 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 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.

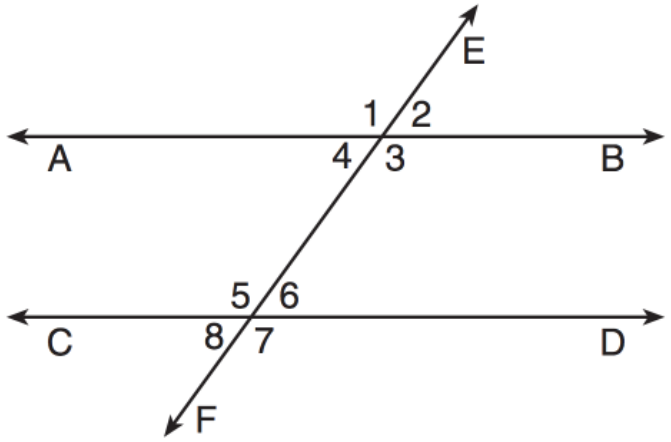
GEOMETRY (COMMON CORE)

Part I

Answer all 24 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. [48]

Use this space for computations.

1 Transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$, as shown in the diagram below.



If $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, which statement can *not* always be proven?

(1) $\angle 2 \cong \angle 8$

(2) $\angle 4 \cong \angle 6$

(3) $\angle 1$ and $\angle 7$ are supplementary

(4) $\angle 4$ and $\angle 5$ are supplementary

2 Line segment $\overline{AB}$ has endpoints $A(-2, 7)$ and $B(3, 7)$. Line segment $\overline{A''B''}$ is the image of $\overline{AB}$ after two dilations: $D\ \frac{1}{2}$ followed by D_4, both with respect to the origin. The length of $\overline{A''B''}$ is

(1) 5 units

(2) 10 units

(3) 20 units

(4) It cannot be determined from the information given.

Use this space for computations.

3 Line $\overleftrightarrow{EF}$ contains points $E(-4, 3)$ and $F(3, -1)$, and line $\overleftrightarrow{GH}$ is defined by the equation $5x - 4y = -7$. Which statement is true?

(1) $\overleftrightarrow{EF} \parallel \overleftrightarrow{GH}$

(2) $\overleftrightarrow{EF} \perp \overleftrightarrow{GH}$

(3) $\overleftrightarrow{EF}$ and $\overleftrightarrow{GH}$ are the same line.

(4) $\overleftrightarrow{EF}$ and $\overleftrightarrow{GH}$ intersect, but are not perpendicular.

4 Given parallelogram $MNOP$, which reason could be used to prove that $MNOP$ is a rectangle?

(1) $\overline{MO} \cong \overline{NP}$

(2) $\overline{MN} \parallel \overline{OP}$ and $\overline{MP} \parallel \overline{NO}$

(3) $\overline{MO} \perp \overline{NP}$

(4) $\angle M \cong \angle O$ and $\angle N \cong \angle P$

5 If $\triangle ABC$ can be mapped onto $\triangle DEF$ through a sequence of rigid motions, which conclusion is *not* always true?

(1) $\triangle ABC \cong \triangle DEF$

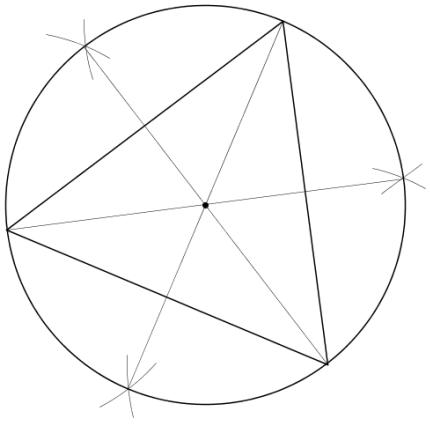
(2) $m\angle BAC = m\angle FDE$

(3) $\overline{BC} \cong \overline{DF}$

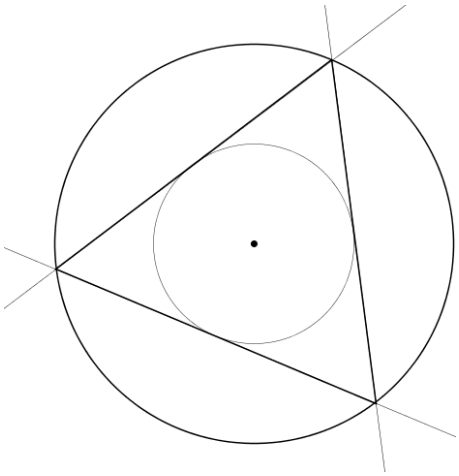
(4) $\angle CBA \cong \angle FED$

Use this space for computations.

6 Which illustration shows an appropriate construction of an equilateral triangle inscribed in a circle?



(1)



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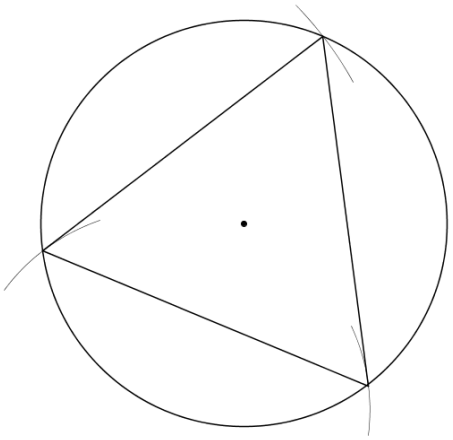

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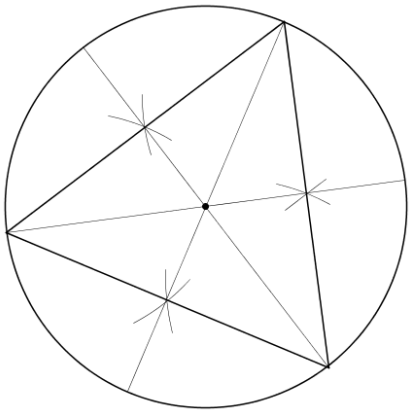


(4)

7 On the directed line segment from $E(7, -5)$ to $F(1, 3)$, what are the coordinates of the point that partitions the segment into a ratio of 4 to 6, to the *nearest tenth*?

(1) (3.0, 0.3)

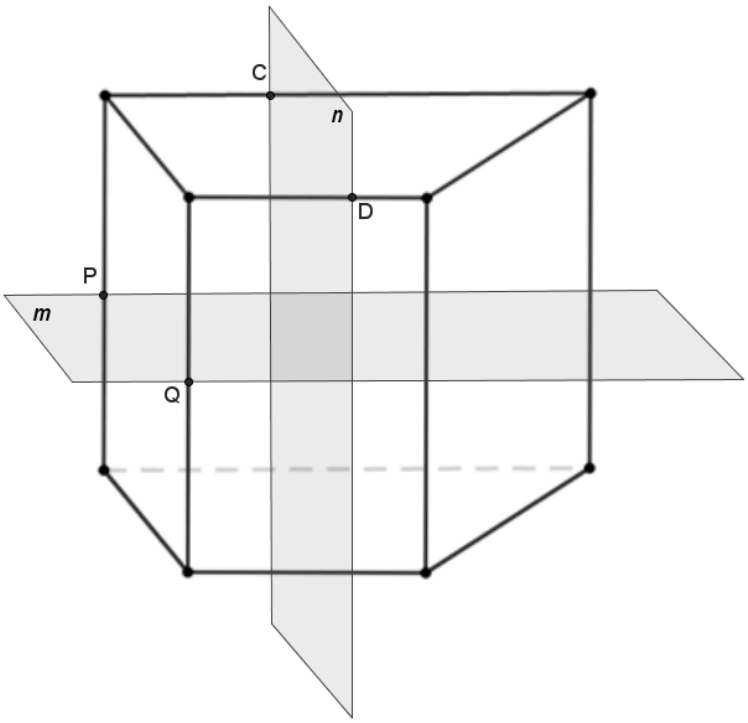
(2) (3.4, –0.2)

(3) (4.6, –1.8)

(4) (5.0, –2.3)

Use this space for computations.

8 A right trapezoidal prism is shown in the diagram below. Vertical plane n intersects the prism at points C and D and horizontal plane m intersects the prism at points P and Q.



What are the shapes of the cross sections created by the two planes with the prism?

(1) Trapezoid and rectangle

(2) Trapezoid and parallelogram

(3) Parallelogram and rectangle

(4) Two trapezoids

9 Which equation represents the circle whose center is (–2, 3) and that passes through the point (–4, 6)?

(1) $(x - 2)^2 + (y + 3)^2 = 13$

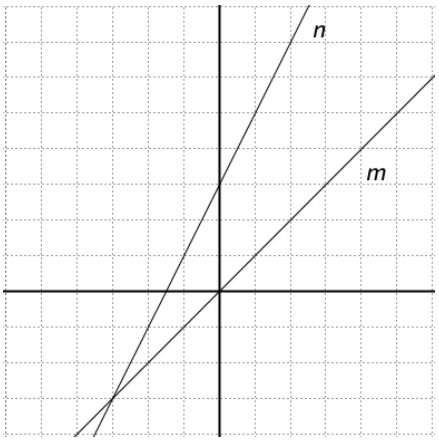
(2) $(x - 2)^2 + (y + 3)^2 = \sqrt{13}$

(3) $(x + 2)^2 + (y - 3)^2 = 13$

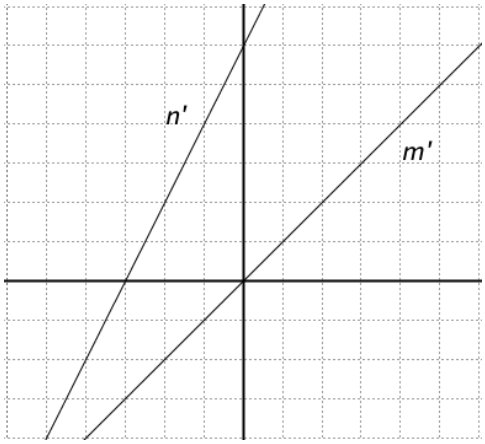
(4) $(x + 2)^2 + (y - 3)^2 = \sqrt{13}$

10 Lines m and n, shown in the diagram below, are both dilated by a scale factor of 2 with respect to the origin.

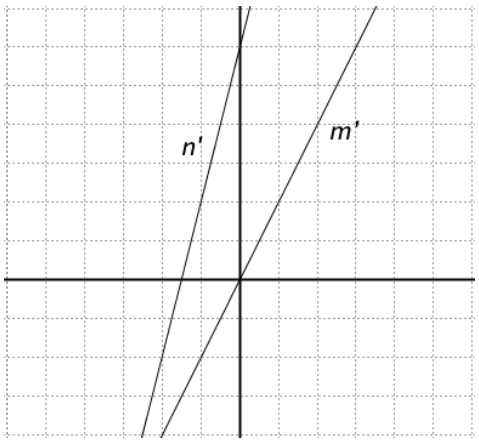
Use this space for computations.



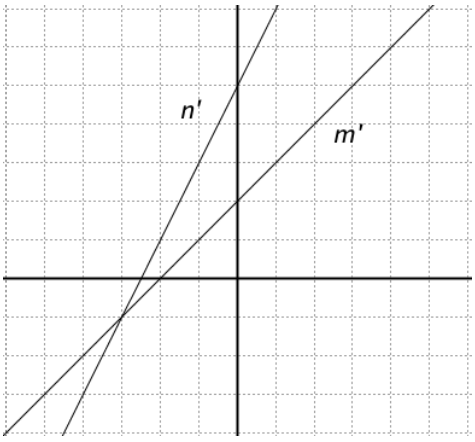
Which diagram shows lines m' and n', the images of line m and n after dilation?



(1)



(3)



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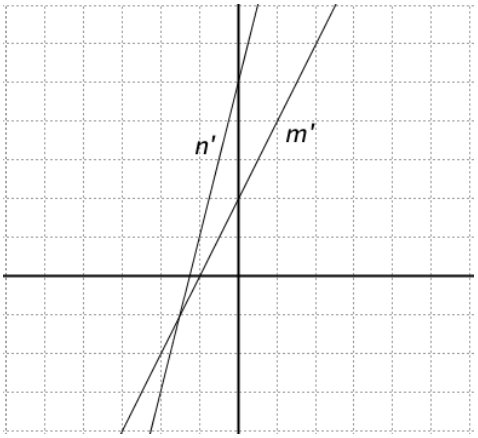
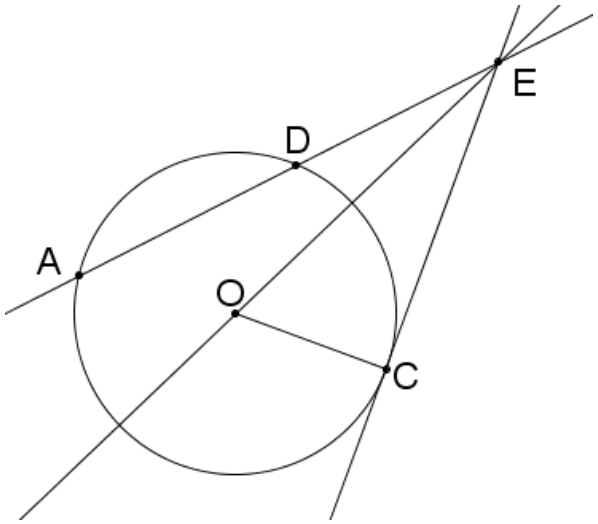


(4)

Use this space for computations.

11 Secants $\overleftrightarrow{ADE}$ and $\overleftrightarrow{OE}$ intersect tangent $\overleftrightarrow{CE}$ at E, as shown in the diagram below, and $\overline{OC}$ is a radius.



(Not drawn to scale)

If $OE = 7$, $OC = 3$, and $DE = 4$, what is AD?

(1) 4.5
(2) 5
(3) 5.2
(4) 6

12 Isosceles triangle ABC has vertices $A(-1, 2)$, $B(-1, -4)$, and $C(5, -1)$. What are the perimeter and area of $\triangle ABC$?

(1) Perimeter = $2 + 3\sqrt{5}$ units; area = 18 square units

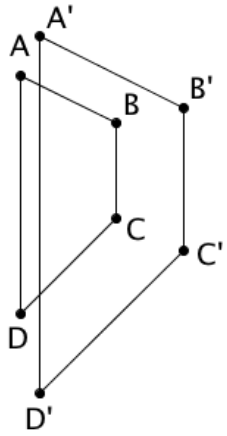
(2) Perimeter = $6 + 3\sqrt{5}$ units; area = 18 square units

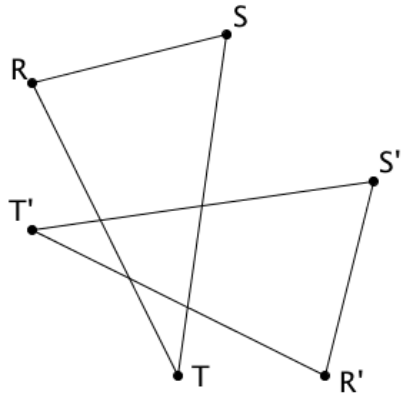
(3) Perimeter = $6 + 6\sqrt{5}$ units; area = 18 square units

(4) Perimeter = $6 + 6\sqrt{5}$ units; area = 36 square units

Use this space for computations.

13 Marilyn is comparing two different transformations, as shown in the diagrams below. Trapezoid $A'B'C'D'$ is the image of trapezoid $ABCD$ after a dilation, and triangle $R'S'T'$ is the image of $\triangle RST$ after a reflection.





Which statement is true?

(1) Distance is preserved in the dilation, but not in the reflection.

(2) Angle measure is preserved in the dilation, but not in the reflection.

(3) Distance is preserved in both transformations.

(4) Angle measure is preserved in both transformations.

14 Triangle ABC undergoes the transformation $R_{180°}(ABC) \rightarrow (XYZ)$. Which statement(s) about $\triangle XYZ$ must be true?

I. $\angle Y$ is congruent to $\angle B$

II. $\overline{YZ}$ is congruent to $\overline{BC}$

III. $\overline{YZ}$ is parallel to $\overline{BC}$

(1) **I** only

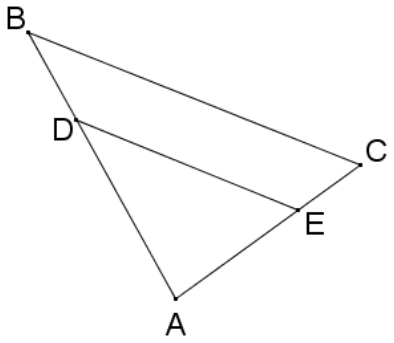
(2) **II** only

(3) **I** and **II** only

(4) **I**, **II**, and **III**

Use this space for computations.

15 Brianna is analyzing two triangles, $\triangle ABC$ and $\triangle ADE$, shown in the diagram below.



If she knows that $\triangle ABC \sim \triangle ADE$ and $\frac{BC}{DE} = \frac{4}{3}$, which statement is *false*?

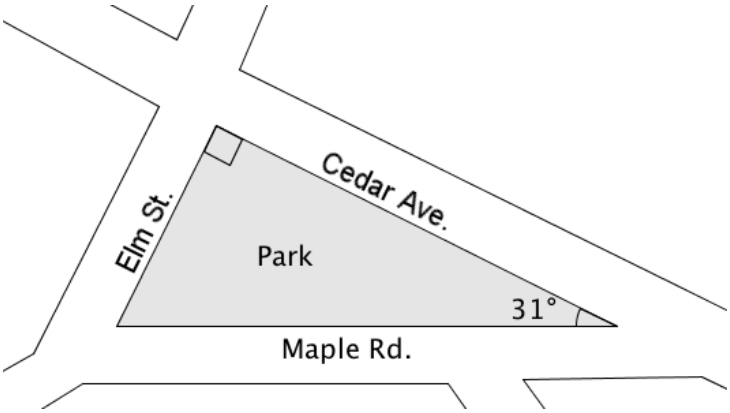
(1) $\frac{AD}{AB} = \frac{3}{4}$

(2) $\frac{CE}{EA} = \frac{4}{3}$

(3) $\frac{DE}{AE} = \frac{BC}{AC}$

(4) $\frac{\text{m}\angle AED}{\text{m}\angle ACB} = 1$

16 A town is developing a park in a right triangular area surrounded by three streets, and the section of a map where the park is located is shown below. On the map, Maple Rd. and Cedar Ave. meet at a 31° angle, and the length of the park along Maple Rd. measures 3 inches.



If the park on the map represents a scale drawing of the *actual* park under a scale factor of $\frac{1}{120}$, what will be the actual length of the park along Cedar Ave., to the *nearest foot*?

(1) 15 feet

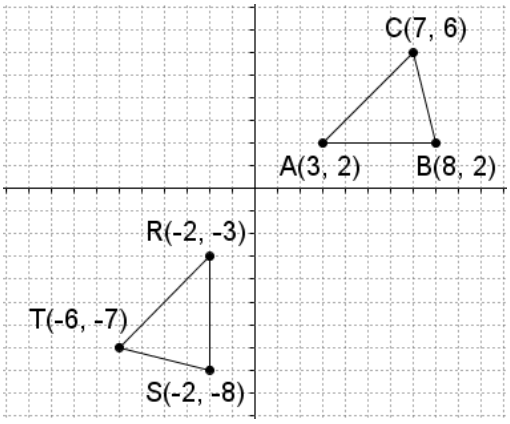
(2) 26 feet

(3) 185 feet

(4) 309 feet

Use this space for computations.

17 In the diagram below, $\triangle ABC \cong \triangle RST$.



Which sequence of rigid motions will *not* carry $\triangle ABC$ onto $\triangle RST$?

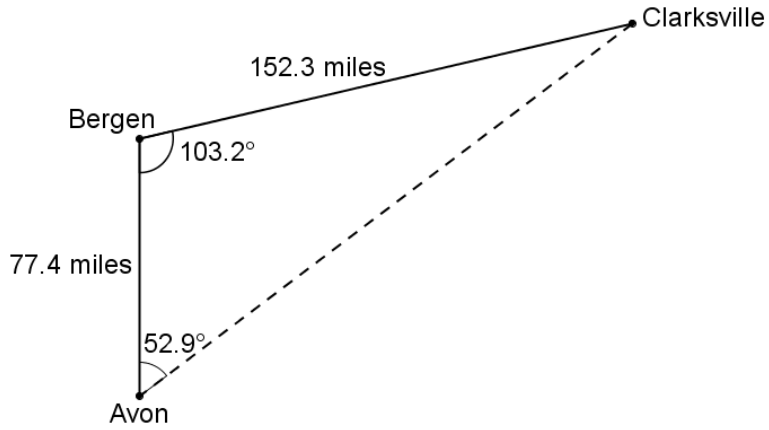
(1) A reflection across the line $y = -x$, followed by a rotation of 180° about the origin

(2) A rotation of 90° counterclockwise, followed by a reflection across the x-axis

(3) A reflection across the line $y = x$, followed by a rotation of 180° about the origin

(4) A rotation of 90° clockwise, followed by a reflection across the y-axis

18 As shown in the map below, it is possible to get from Avon to Clarksville by traveling first to Bergen and then to Clarksville. The state department wants to build a straight highway to connect Avon directly to Clarksville.



To the *nearest tenth of a mile*, the length of the new highway from Avon to Clarksville will be

(1) 94.5 miles

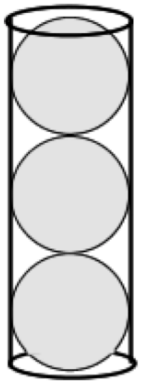
(2) 170.8 miles

(3) 185.9 miles

(4) 191.0 miles

Use this space for computations.

19 As shown in the diagram below, a cylindrical tennis ball container with a diameter of 7.0 cm and a height of 20.8 cm can hold three spherical tennis balls, each with a diameter of 6.8 cm. A company is trying to design a better container and wants to first determine how much "empty space" there is in the current container when filled with tennis balls.



To the *nearest tenth of a cubic centimeter*, what is the volume of the space in the container that is *not* filled by tennis balls?

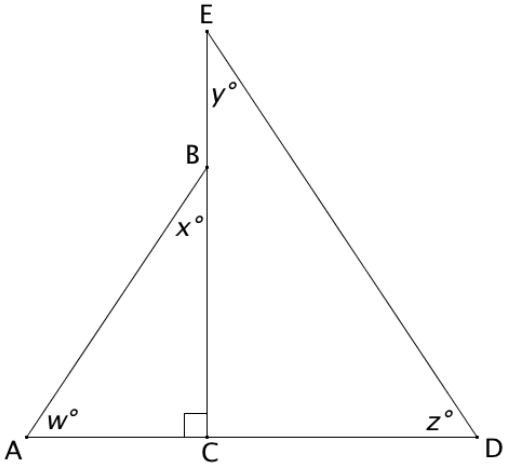
(1) 306.6 cm^3

(2) 493.9 cm^3

(3) 635.8 cm^3

(4) 1884.8 cm^3

20 In the diagram below of two right triangles, $\triangle ABC \sim \triangle DEC$ and $BC > AC$.



Which statement is *false*?

(1) $\sin(x) = \cos(w)$

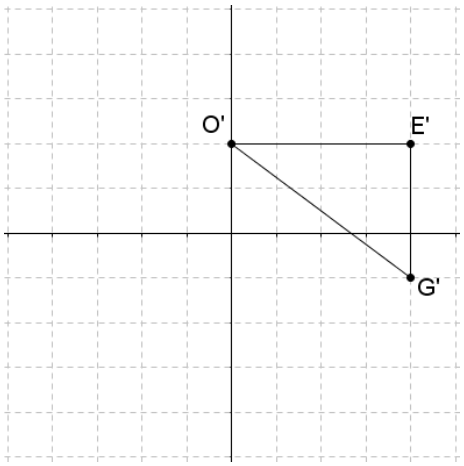
(2) $\cos(y) = \sin(w)$

(3) $\cos(w) = \sin(z)$

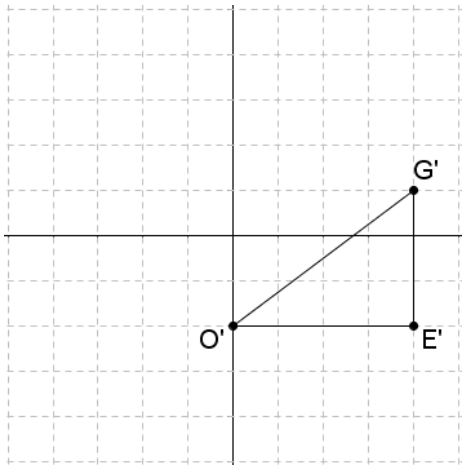
(4) $\sin(x) = \cos(z)$

Use this space for computations.

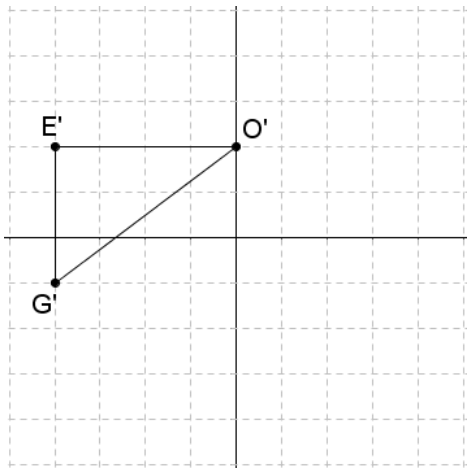
21 Triangle GEO has coordinates $G(-1,4)$, $E(2,4)$, and $O(2,0)$. Which graph shows $\triangle G'E'O'$, the image of $\triangle GEO$ after the transformation $(x, y) \rightarrow (-y, x)$?



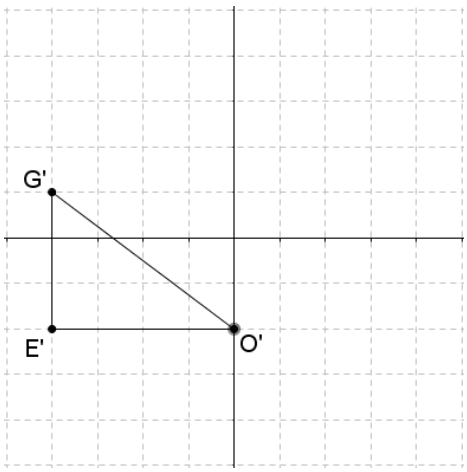
(1)



(3)



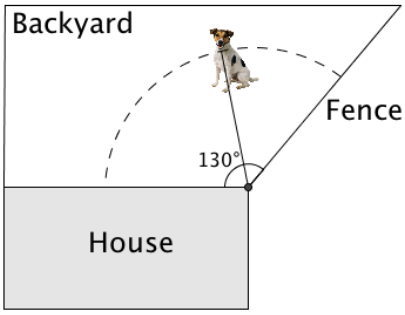
(2)



(4)

Use this space for computations.

22 As shown in the accompanying diagram, a dog is tied to a 16-foot leash, which is attached to a corner where the house and fence meet. At this corner, the angle between the house and the fence is 130°.



(Not drawn to scale)

When the dog pulls the leash tight and walks from the house to the fence, what is the distance that the dog walks, to the *nearest tenth of a foot*?

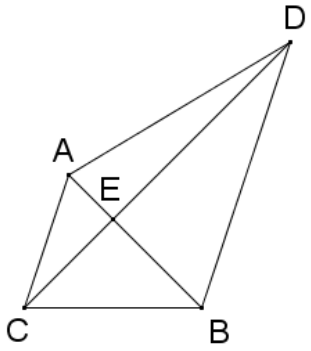
(1) 11.6 feet

(2) 18.2 feet

(3) 32.0 feet

(4) 36.3 feet

23 As shown in the diagram below, $\overline{AC} \parallel \overline{DB}$ and $\frac{AE}{EB} = \frac{AC}{DB}$.



Which method(s) could be used to prove that $\triangle AEC \sim \triangle BED$?

I. Angle-Angle

II. Side-Angle-Side

III. Side-Side-Side

(1) **I** only

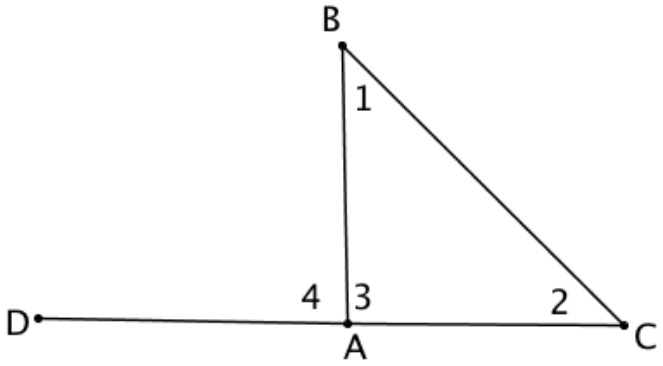
(2) **II** only

(3) **I** and **II** only

(4) **I**, **II**, and **III**

Use this space for computations.

24 In the diagram below, $\triangle ABC$ is shown with side $\overline{CA}$ extended to point D.



Corrine wants to prove that $m\angle 4 = m\angle 1 + m\angle 2$ and has written the following proof, but she is missing one statement and one reason:

Statements	**Reasons**
1. $\triangle ABC$, side $\overline{CA}$ extended to point D	**1.** Given
2. $\angle 3$ and $\angle 4$ form a linear pair	**2.** Definition of a linear pair
3. $m\angle 3 + m\angle 4 = 180°$	**3.** Linear pairs form supplementary angles
4. $m\angle 1 + m\angle 2 + m\angle 3 = 180°$	**4.** Sum of the angle measures in a triangle is 180°
5. _____	**5.** _____
6. $m\angle 4 = m\angle 1 + m\angle 2$	**6.** Subtraction property of equality

Which statement and reason *best* complete Corrine's proof?

(1) *Statement:* $m\angle 3 + m\angle 4 = m\angle 1 + m\angle 2 + m\angle 3$

Reason: Substitution property of equality

(2) *Statement:* $m\angle 1 = m\angle 2$

Reason: Base angles of an isosceles triangle have equal measure

(3) *Statement:* $m\angle 4 > m\angle 2$

Reason: The measure of an exterior angle is greater than both opposite interior angles

(4) *Statement:* $m\angle 3 = m\angle 4 = 90°$

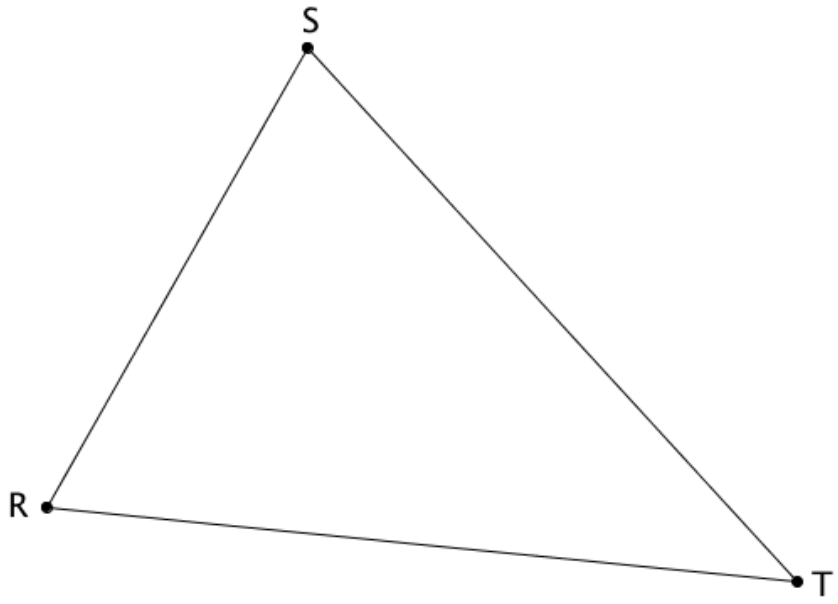
Reason: Definition of a right angle

Part II

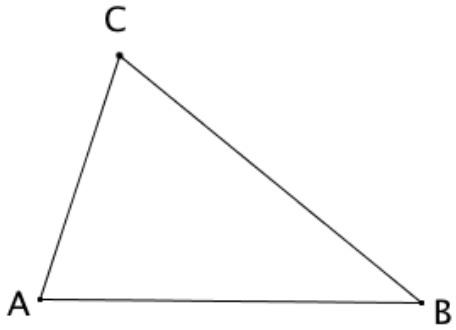
Answer all 7 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [14]

25 On the accompanying diagram of $\triangle RST$, use a compass and a straightedge to construct a median from R to $\overline{ST}$.

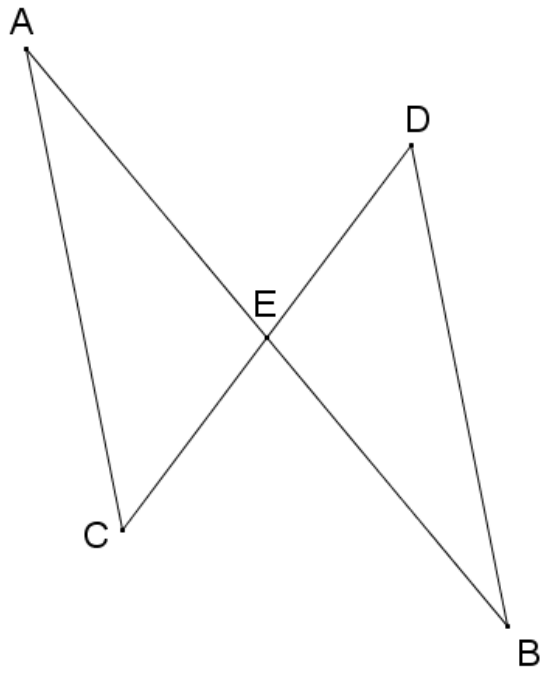
[Leave all construction marks.]



26 Given $\triangle ABC$ below, prove that $m\angle CAB + m\angle ACB + m\angle CBA = 180°$.



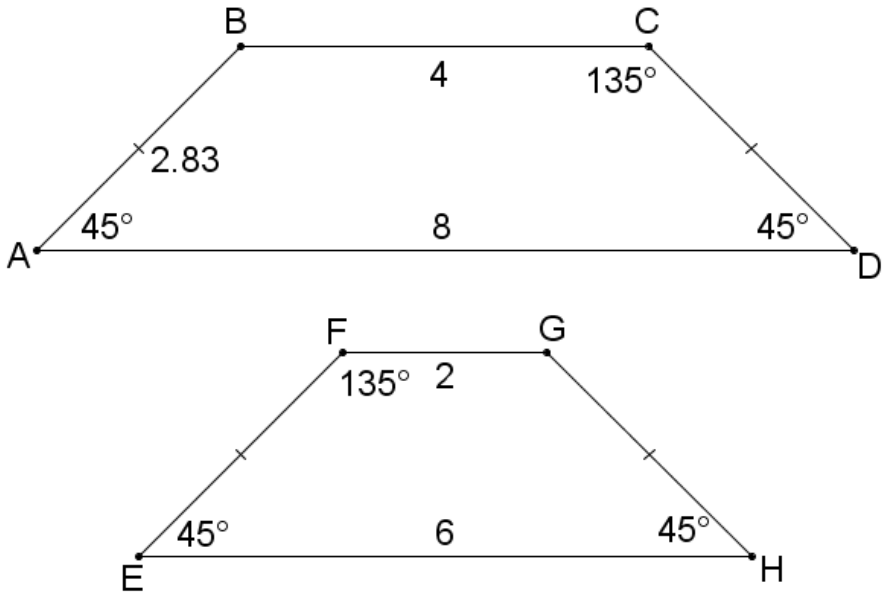
27 In the diagram below of $\triangle AEC$ and $\triangle BED$, $\overline{AC} \parallel \overline{DB}$, and $\overline{AB}$ bisects $\overline{CD}$ at E.



Complete the proof that $\triangle AEC \cong \triangle BED$.

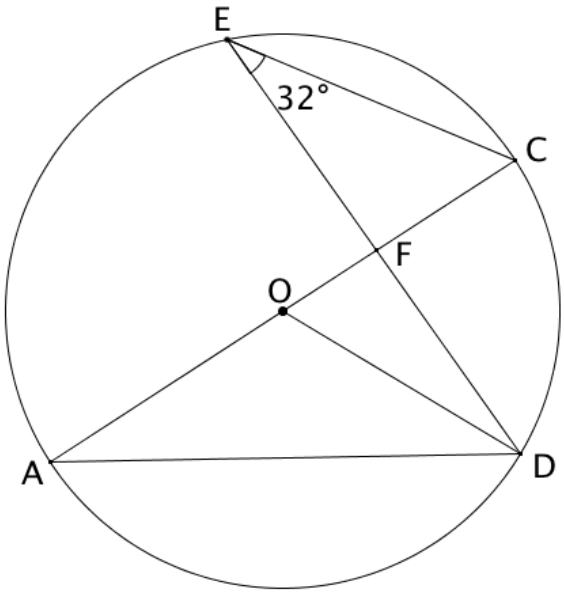
Statements	**Reasons**
1. $\triangle AEC$ and $\triangle BED$, $\overline{AC} \parallel \overline{DB}$	**1.** Given
2. $\angle AEC \cong \angle DEB$	**2.** _____
3. _____	**3.** _____
4. $\overline{CE} \cong \overline{ED}$	**4.** Definition of bisector
5. $\triangle AEC \cong \triangle BED$	**5.** _____

28 Trapezoids *ABCD* and *EFGH* are shown below.



Determine if *ABCD* ~ *EFGH* and explain your answer.

29 In the diagram of circle O below, chord $\overline{ED}$ intersects diameter $\overline{AC}$ at F, radius $\overline{OD}$ is drawn, and $m\angle E = 32°$.



Determine $m\angle COD$ and $m\angle ODA$.

Explain why $\triangle EFC \sim \triangle AFD$.

30 A regular hexagon is inscribed in a circle with radius r. Name another regular polygon that, when inscribed in the same circle, has an area that better approximates the area of the circle than does the area of the regular hexagon. Explain how you know this is true.

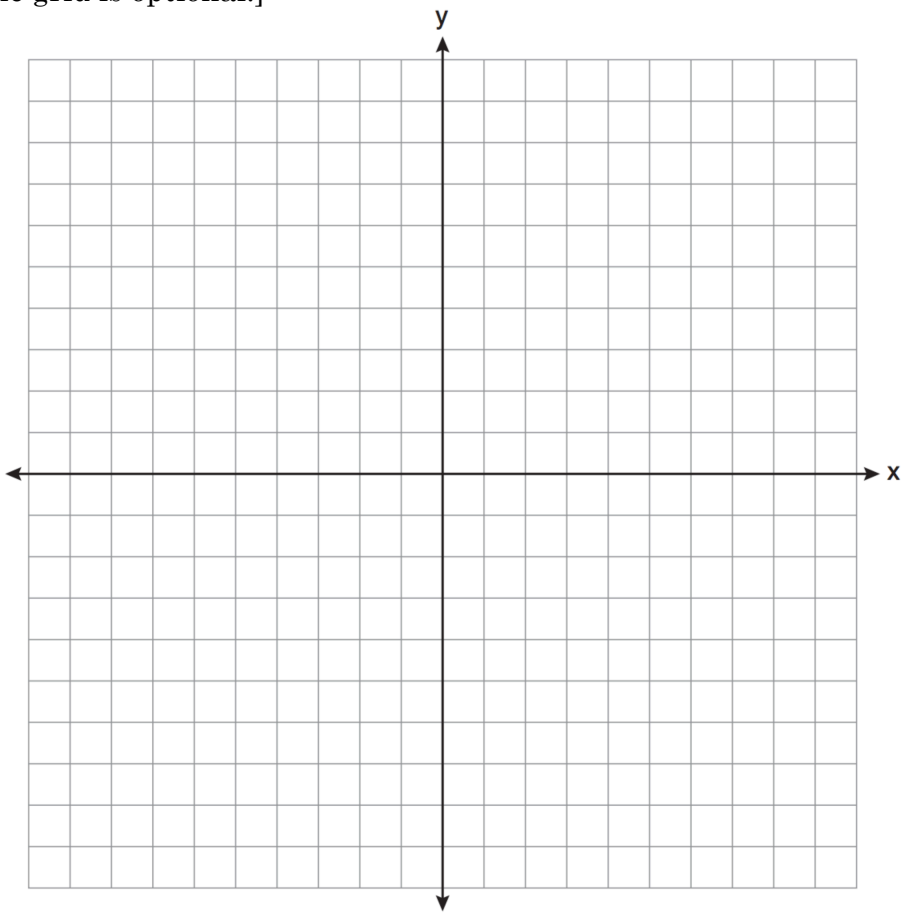
31 You have been hired to design the shelves for the soup aisle in a new grocery store. The storeowner has requested that the shelves be constructed so that exactly *four* cylindrical soup cans can stack one on top of another, with a 3-inch gap between the top can and the next shelf above. The manager does not know how tall one can of soup is, but he does tell you that each can has a diameter of 3 inches and a volume of 10.125π in^3. Determine the exact distance between the shelves that will satisfy the storeowner's requirements.

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]

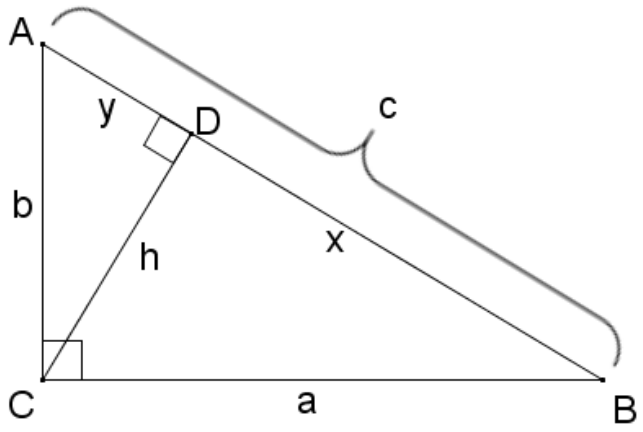
32 The coordinates of rectangle *MATH* are *M*(–1, –3), *A*(–4, –3), *T*(–4, 2), and *H*(–1, 2). State the coordinates of *M"A"T"H"*, the image of *MATH* after it undergoes a translation two units to the left and three units down, followed by a point reflection through the origin.

[The use of the grid is optional.]



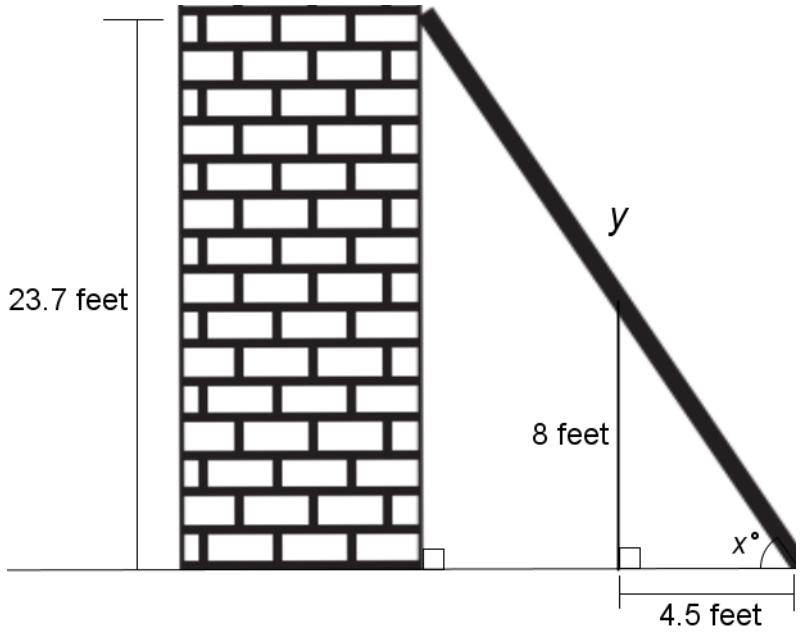
Using the definition of congruence in terms of rigid motions, determine if rectangles *MATH* and *M"A"T"H"* are congruent and explain how you know.

33 Right triangles *ACB*, *ADC*, and *CDB* are shown below, and $\triangle ACB \sim \triangle ADC \sim \triangle CDB$.



Use triangle similarity from this diagram to prove that $a^2 + b^2 = c^2$.

34 As shown in the diagram below, the base of a ladder rests on the ground 4.5 feet from an 8-foot fence, and leans against a wall.



(Not drawn to scale)

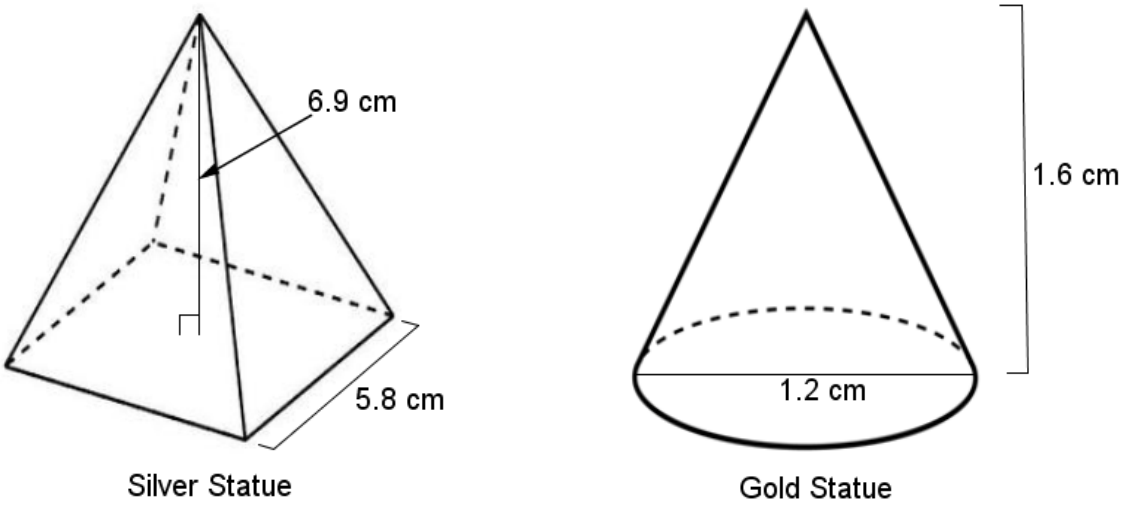
If the ladder touches the top of the fence and reaches the wall at a height of 23.7 feet from the ground, determine the measure of angle x that the ladder makes with the ground to the *nearest tenth of a degree*.

Using the angle found above, determine the length of the ladder, y, to the *nearest tenth of a foot*.

Part IV

Answer both questions in this part. Each 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. [12]

35 Luke is comparing the value of two small metal statues, one made of solid silver and one made of solid gold. As shown below, the silver statue is in the shape of a regular pyramid with a square base, which has a side length of 5.8 cm and a height of 6.9 cm, and the gold statue is in the shape of a right circular cone with a diameter of 1.2 cm and a height of 1.6 cm. The density of silver is 10.49 g/cm^3 and the density of gold is 19.32 g/cm^3.



Silver Statue Gold Statue

(Not drawn to scale)

Determine the weight of each statue, to the *nearest gram*.

Question 35 is continued on the next page.

Question 35 continued

If silver is valued at \$0.53 per gram and gold is valued at \$38.17 per gram, use the weights found above to determine which statue has a higher value *and* by how much, to the *nearest cent*.

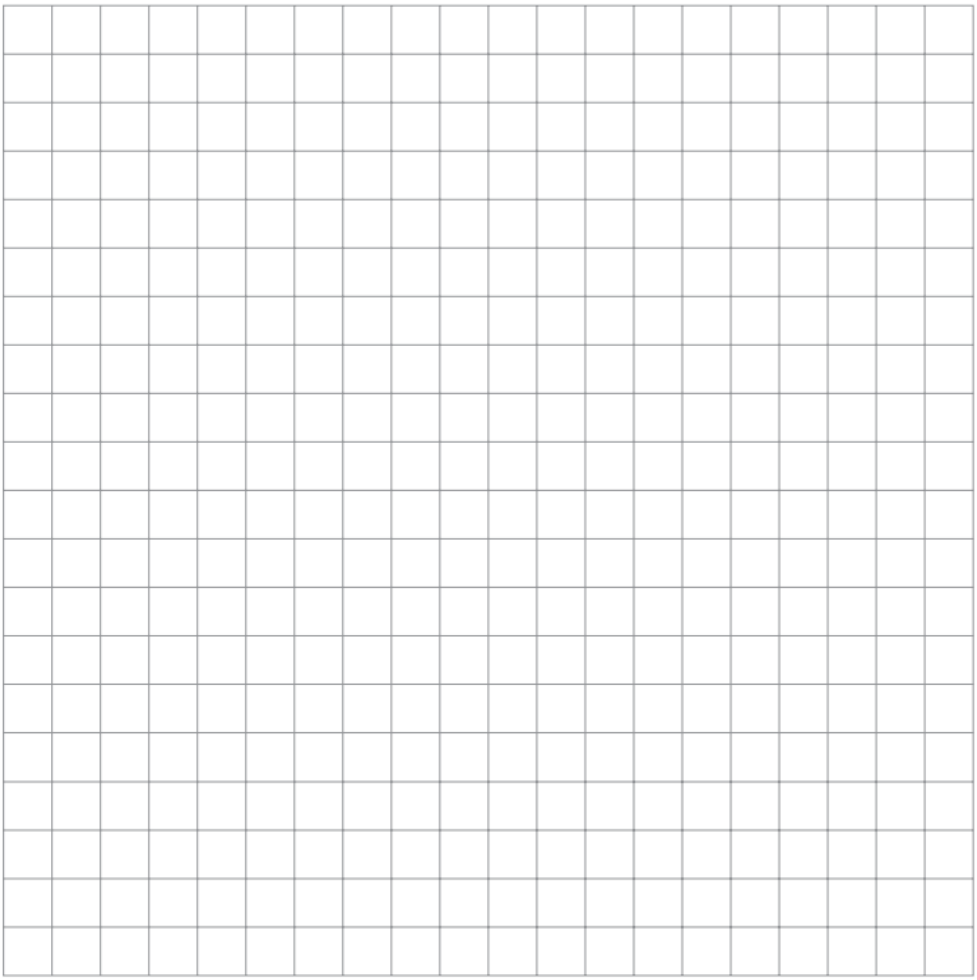
If both statues were melted down, about how many gold statues, to the *nearest whole number*, would need to be melted in order to have the same volume as a single silver statue?

36 John created quadrilateral $QUAD$ with vertices $Q(-4, 2)$, $U(-4, -3)$, $A(4, 1)$, and $D(0, 4)$ using a new graphing program on his computer.

Prove that Jim's quadrilateral is an isosceles trapezoid but *not* a rectangle.

[The use of the grid on the next page is optional.]

Question 36 continued



FOR TEACHERS ONLY

Network 603

PRACTICE REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY (Common Core)

Practice Exam

SCORING KEY AND RATING GUIDE

Part I

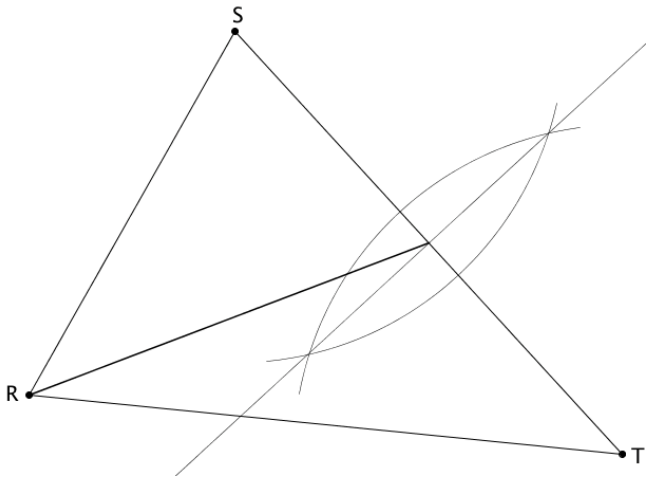
Allow a total of 48 credits, 2 credits for each of the following:

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

Answers and sample responses are provided below for Parts II, III, and IV.
Please note that, due to time constraints on this project, full rubrics were not designed.

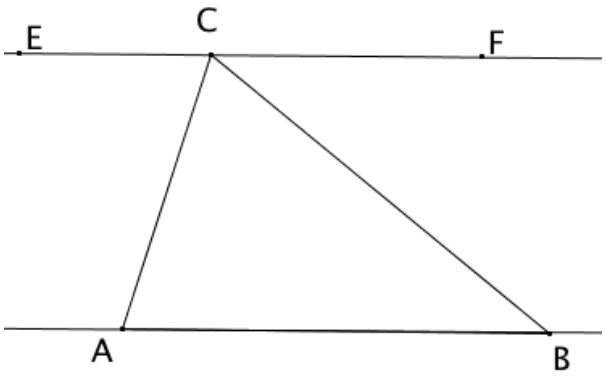
Part II

25 ***Sample Response***



26 ***Sample Response***

Draw line $\overleftrightarrow{AB}$ through side $\overline{AB}$ and draw a second line, call it $\overleftrightarrow{EF}$, through point C such that $\overleftrightarrow{AB} \parallel \overleftrightarrow{EF}$. Line $\overleftrightarrow{EF}$ creates two new angles, $\angle ECA$ and $\angle FCB$.



Statement	*Reason*
1. $\angle ECA \cong \angle CAB$ and $\angle FCB \cong \angle CBA$	1. Alternate interior angles formed by a transversal intersecting two parallel lines are congruent.
2. $m\angle ECA = m\angle CAB$ and $m\angle FCB = m\angle CBA$	2. Congruent angles have equal measure.
3. $m\angle ECA + m\angle ACB + m\angle FCB = 180°$	3. Angles on a straight line add to 180°.
4. $m\angle CAB + m\angle ACB + m\angle CBA = 180°$	4. Substitution theorem of equality

27 ***Sample Responses***

Reason 2: Vertical angles are congruent
Statement 3: $\angle C \cong \angle D$
Reason 5: ASA

OR

Reason 2: Vertical angles are congruent
Statement 3: $\angle A \cong \angle B$
Reason 5: AAS

28 ***Sample Response***

No, because for two figures to be similar, all corresponding sides of the figure must be in proportion. As given, $\frac{BC}{FG} = \frac{4}{2} = 2$ but $\frac{AD}{EH} = \frac{6}{8} = \frac{3}{4}$, and so since $2 \neq \frac{3}{4}$, the two figures are not similar.

29 ***Answer & Sample Response***

Part 1

$m\angle COD = 64°$; because $m\widehat{CD} = 64°$ and $m\angle COD = m\widehat{CD}$
$m\angle ODA = 32°$; because $m\angle AOD = 116°$ and $m\angle CAD = 32°$, and so $m\angle ODA = 32°$ because $\triangle AOD$ is isosceles (or because $180° - 116° - 32° = 32°$)

Part 2

$\angle A \cong \angle C$ (inscribed angles subtending the same arc are congruent) and $\angle EFC \cong \angle AFD$ (vertical angles are congruent) and so by AA, $\triangle EFC \sim \triangle AFD$

30 ***Sample Response***

A regular octagon inscribed in the same circle would have an area that better approximates the circle's area than the hexagon's area because the octagon has a greater number of sides than the hexagon, and as the number of sides increases (i.e. approaches infinity), the regular polygon approaches the shape of a circle.

31 ***Answer***

$V = \pi r^2 h$
$10.125\pi = \pi(1.5)^2 h$
$10.125\pi = 2.25\pi h$
$10.125 = 2.25h$
$4.5 = h$
The height of one soup can is 4.5 inches, so the shelves should be $4(4.5) + 3 = 21$ inches apart

Part III

32 ***Answer & Sample Response***

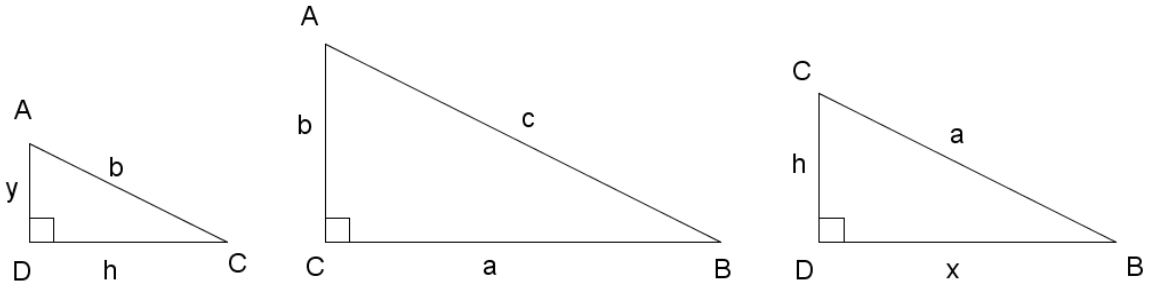
Part 1

$M''(3, 6)$, $A''(6, 6)$, $T''(6, 1)$, $H''(3, 1)$

Part 2

Since two figures are congruent if there exists one or more rigid motions that will map one figure one the other, *MATH* and *M"A"T"H"* must be congruent because *MATH* can be mapped onto *M"A"T"H"* through a sequence of rigid motions (translation and reflection).

33 ***Sample Response***



(Figures not necessary for full credit)

$\frac{a}{c} = \frac{x}{a} \rightarrow a^2 = cx$

$\frac{b}{c} = \frac{y}{b} \rightarrow b^2 = cy$

Since the goal is to show that $a^2 + b^2 = c^2$, use substitution:

$a^2 + b^2 = cx + cy$
$a^2 + b^2 = c(x + y)$

And since $x + y = c$ (see original image), $a^2 + b^2 = c(c)$ by substitution and so $a^2 + b^2 = c^2$.

34 ***Answers***

Part 1

$\tan^{-1}\left(\frac{8}{4.5}\right) \approx 60.6°$

Part 2

$\sin(60.6°) = \frac{23.7}{y} \rightarrow y = \frac{23.7}{\sin(60.6°)} \approx 27.2$ feet

Part IV

35 ***Answers***

Part 1

Weight of the silver statue = (volume)·(density) = $(1/3)(5.8)^2(6.9)\cdot(10.49) \approx 812$ grams.
Weight of the gold statue = (volume)·(density) = $(1/3)(\pi)(0.6)^2(1.6)\cdot(19.32) \approx 12$ grams.

Part 2

Value of the silver statute = (812 grams)·($0.53 per gram) = $430.36.
Value of the gold statute = (12 grams)·($38.17 per gram) = $458.04.
So the *gold* statue has the higher value, by $27.68.

Part 3

About 128 *or* 129 gold statues (accept either), because the number of gold statues needed to have the same volume as a silver statue is the volume of one silver statue divided by the volume of one gold statue = 77.372/0.603 = 128.3 ≈ 128 (or if student used a less precise rounding, such as 77.4/0.60 = 129, that is acceptable)

36 ***Sample Response***

Statement	*Reason*
1. $Q(-4, 2)$, $U(-4, -3)$, $A(4, 1)$, $D(0, 4)$	1. Given
2. $\overline{QD} \parallel \overline{UA}$	2. Slope of $\overline{QD} = (4 - 2)/(0 - -4) = 2/4 = 0.5$ Slope of $\overline{UA} = (-3 - 1)/(-4 - 4) = -4/-8 = 0.5$ Lines with equal slopes are parallel.
3. *QUAD* is a trapezoid	3. A quadrilateral with at least one pair of parallel sides is a trapezoid.
4. $\overline{QU} \cong \overline{DA}$	4. Length of $\overline{QU}$ is $\sqrt{(-4 - -4)^2 + (-3 - 2)^2} = \sqrt{(0)^2 + (-5)^2} = 5$ Length of $\overline{DA}$ is $\sqrt{(0 - 4)^2 + (4 - 1)^2} = \sqrt{(-4)^2 + (3)^2} = 5$ Line segments with equal length are congruent.
5. *QUAD* is an isosceles trapezoid	5. A trapezoid with one pair of sides parallel and the other pair of sides congruent is an isosceles trapezoid.
6. $\overline{QU} \nparallel \overline{DA}$	6. Slope of $\overline{QU} = (-3 - 2)/(-4 - -4) = -5/0 =$ undefined Slope of $\overline{DA} = (4 - 1)/(0 - 4) = 3/-4 = -0.75$ Lines with unequal slopes are not parallel.
7. *QUAD* is not a rectangle	7. Rectangles have both pairs of opposite sides parallel .

Alternatively, Statement 6 could have involved showing that $\overline{QD}$ and $\overline{UA}$ are not congruent using segment lengths, or showing that either $\overline{QU}$ or $\overline{DA}$ is not perpendicular to $\overline{QD}$ or $\overline{UA}$ using slopes, with Reason 7 being revised accordingly.

Practice Regents Exam

Item Standards Alignment

Sorted by Item Number

Item	Type	Standard
1	MC	G-CO.C.9
2	MC	G-SRT.A.1b
3	MC	G-GPE.B.5
4	MC	G-CO.C.11
5	MC	G-CO.B.7
6	MC	G-CO.13
7	MC	G-GPE.B.6
8	MC	G-GMD.B.4
9	MC	G-GPE.A.1
10	MC	G-SRT.A.1a
11	MC	G-C.A.2
12	MC	G-GPE.B.7
13	MC	G-CO.A.2
14	MC	G-CO.B.6
15	MC	G-SRT.A.2
16	MC	G-SRT.C.8
17	MC	G-CO.A.5
18	MC	G-SRT.C.8
19	MC	G-GMD.A.3
20	MC	G-SRT.C.7
21	MC	G-CO.A.5
22	MC	G-C.B.5
23	MC	G-SRT.B.5
24	MC	G-CO.C.10
25	SR2	G-CO.D.12
26	SR2	G-CO.C.10
27	SR2	G-SRT.B.5
28	SR2	G-SRT.A.2
29	SR2	G-C.A.2
30	SR2	G-GMD.A.1
31	SR2	G-MG.A.3
32	SR4	G-CO.B.6
33	SR4	G-SRT.B.4
34	SR4	G-SRT.C.8
35	SR6	G-MG.A.2
36	SR6	G-GPE.B.4

Sorted by Standard

Standard	Item	Type
G-C.A.2	11	MC
G-C.A.2	29	SR2
G-C.B.5	22	MC
G-CO.13	6	MC
G-CO.A.2	13	MC
G-CO.A.5	17	MC
G-CO.A.5	21	MC
G-CO.B.6	14	MC
G-CO.B.6	32	SR4
G-CO.B.7	5	MC
G-CO.C.9	1	MC
G-CO.C.10	24	MC
G-CO.C.10	26	SR2
G-CO.C.11	4	MC
G-CO.D.12	25	SR2
G-GMD.A.1	30	SR2
G-GMD.A.3	19	MC
G-GMD.B.4	8	MC
G-GPE.A.1	9	MC
G-GPE.B.4	36	SR6
G-GPE.B.5	3	MC
G-GPE.B.6	7	MC
G-GPE.B.7	12	MC
G-MG.A.2	35	SR6
G-MG.A.3	31	SR2
G-SRT.A.1a	10	MC
G-SRT.A.1b	2	MC
G-SRT.A.2	15	MC
G-SRT.A.2	28	SR2
G-SRT.B.4	33	SR4
G-SRT.B.5	23	MC
G-SRT.B.5	27	SR2
G-SRT.C.7	20	MC
G-SRT.C.8	16	MC
G-SRT.C.8	18	MC
G-SRT.C.8	34	SR4