The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Tuesday, June 23, 2026 — 1:15 to 4:15 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 35 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. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale.

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 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. 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. [48]

Use this space for computations.

1 Which transformation would result in the area of a rectangle's image being different from the area of its pre-image?

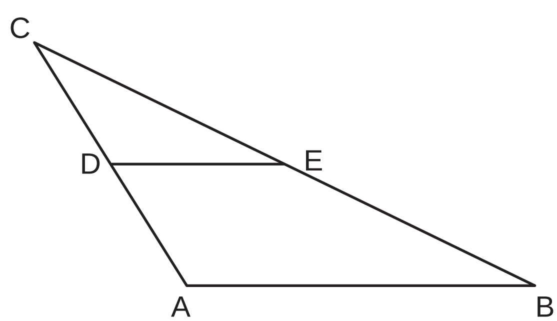
(1) a reflection over the y-axis

(2) a translation 4 units to the right

(3) a rotation of 90° counterclockwise about the origin

(4) a vertical stretch of scale factor 3 with respect to $y = 0$

2 In the diagram below of $\triangle ABC$, points D and E are the midpoints of $\overline{CA}$ and $\overline{CB}$, respectively.



Which statement must always be true?

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

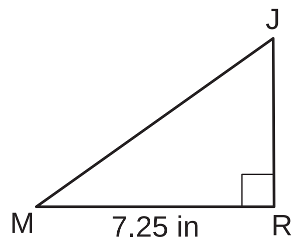
(2) $DE = \frac{1}{2}AC$

(3) $AD = \frac{1}{2}AB$

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

3 In triangle RJM below, $m\angle R = 90°$ and $MR = 7.25$ inches.

Use this space for computations.

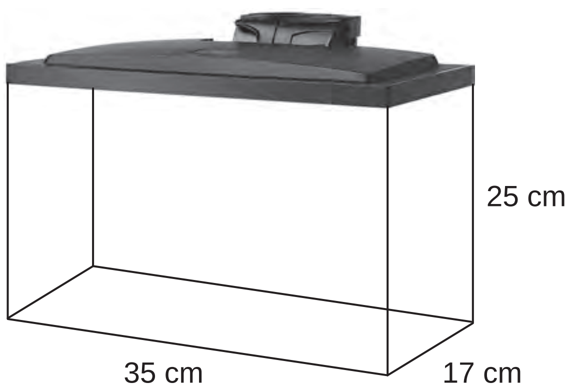


If the measure of angle M is 35°, what is the length of $\overline{MJ}$, to the *nearest hundredth of an inch*?

(1) 4.16 (3) 8.85

(2) 5.94 (4) 12.64

4 A fish tank in the shape of a rectangular prism with a length of 35 cm, width of 17 cm, and a height of 25 cm is shown below.



If the fish tank is filled with water to a height 3 centimeters from the top, how many liters of water are in this tank, to the *nearest liter*?

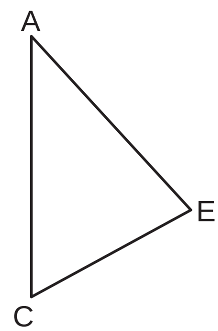
[1 liter = 1000 cubic centimeters]

(1) 10 (3) 15

(2) 13 (4) 17

Use this space for computations.

5 Triangle ACE is drawn below. Triangle ACE is mapped onto triangle AXE after a reflection over side $\overline{AE}$. Triangle AXE is then mapped onto triangle LXE after a reflection over side $\overline{XE}$.



Which side of $\triangle LXE$ is the image of $\overline{AC}$?

(1) $\overline{LE}$

(2) $\overline{AX}$

(3) $\overline{XE}$

(4) $\overline{LX}$

6 The lines whose equations are represented by $y = -\frac{1}{2}x + 2$ and $x + 2y = 8$ are

(1) parallel

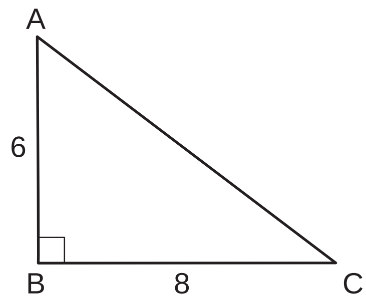
(2) perpendicular

(3) the same line

(4) neither parallel nor perpendicular

Use this space for computations.

7 Right triangle *ABC* below has legs whose lengths are 6 and 8.

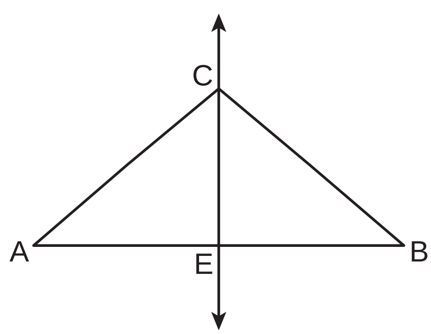


What is the volume of the three-dimensional object formed by continuously rotating $\triangle ABC$ about $\overline{AB}$?

(1) 96π (3) 288π

(2) 128π (4) 384π

8 In $\triangle ABC$ below, $\overleftrightarrow{CE}$ is the perpendicular bisector of $\overline{AEB}$.



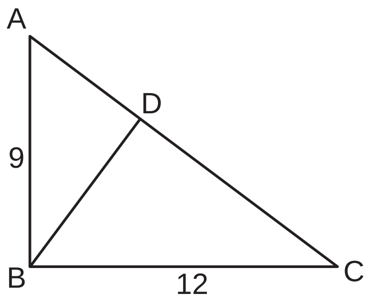
Which statement is always true?

(1) $\overline{AC} \cong \overline{BC}$ (3) $\angle EAC \cong \angle BCE$

(2) $\overline{AE} \cong \overline{CE}$ (4) $m\angle A + m\angle B = 90°$

Use this space for computations.

9 In right triangle ABC below, $AB = 9$, $BC = 12$, and altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$.



Which equation is always true for $\overline{BD}$?

(1) $\cos A = \frac{BD}{9}$

(2) $\sin C = \frac{BD}{12}$

(3) $\tan A = \frac{BD}{9}$

(4) $\sin C = \frac{BD}{15}$

10 Which regular polygon, when rotated about its center, carries onto itself after both a 120° rotation and a 180° rotation?

(1) triangle

(2) square

(3) hexagon

(4) octagon

11 The coordinates of the endpoints of $\overline{PA}$ are $P(3, -6)$ and $A(-2, 9)$. If point C is on $\overline{PA}$, what are the coordinates of C such that $PC{:}CA = 1{:}4$?

(1) $(-1, 6)$

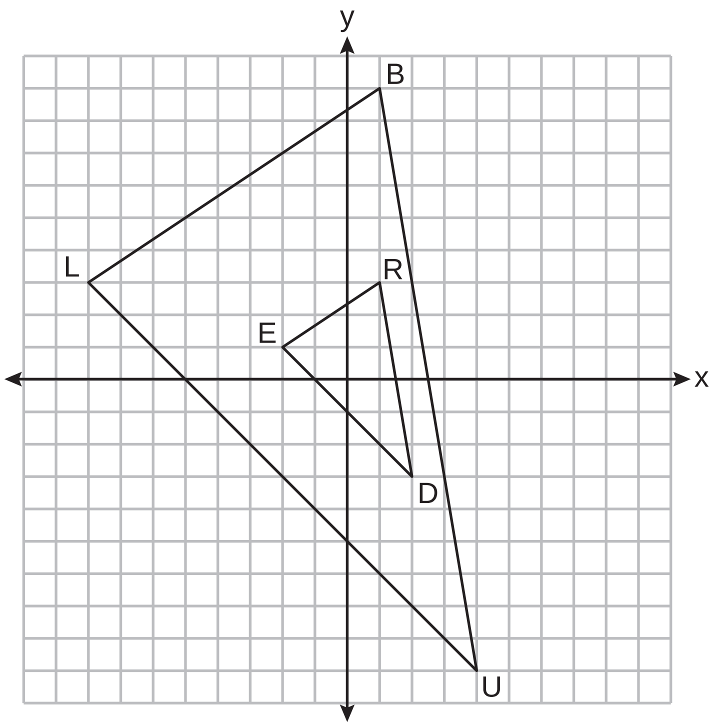
(2) $(0, 3)$

(3) $(1, 0)$

(4) $(2, -3)$

Use this space for computations.

12 On the set of axes below, $\triangle BLU$ is the image of $\triangle RED$ after a dilation.



What are the scale factor and the coordinates of the center of dilation of this transformation?

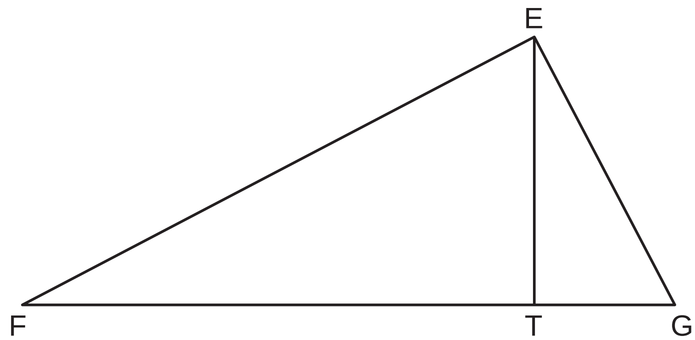
(1) 2 and (0, 0)
(2) 2 and (1, 0)
(3) 3 and (0, 0)
(4) 3 and (1, 0)

13 What are the coordinates of the center and the length of the radius of the circle whose equation is $x^2 + y^2 = 45 + 4x$?

(1) center (2, 0) and radius 7
(2) center (−2, 0) and radius 7
(3) center (2, 0) and radius 49
(4) center (−2, 0) and radius 49

Use this space for computations.

14 In right triangle EFG below, altitude $\overline{ET}$ is drawn to hypotenuse $\overline{FG}$.



If $EF = 17$ and $FT = 15$, what is the length of $\overline{TG}$, to the *nearest tenth*?

(1) 3.8 (3) 8.0

(2) 4.3 (4) 9.1

15 In trapezoid $ERJT$, sides $\overline{ER}$ and $\overline{TJ}$ are parallel.
If $m\angle R = (2x + 15)°$ and $m\angle J = (3x - 40)°$, what is $m\angle J$?

(1) 125° (3) 83°

(2) 97° (4) 55°

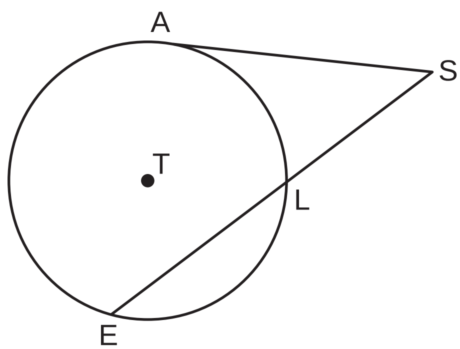
Use this space for computations.

16 In isosceles right triangle ABC, the length of hypotenuse $\overline{AC}$ is 14. What is the length of $\overline{BC}$, to the *nearest tenth*?

(1) 7.0 (3) 9.9

(2) 8.1 (4) 19.8

17 In circle T below, tangent $\overline{AS}$ and secant $\overline{ELS}$ are drawn.



If $SL = 8$ and $LE = 10$, the length of $\overline{AS}$ is

(1) $\sqrt{18}$ (3) 9

(2) $\sqrt{80}$ (4) 12

18 Parallelogram $MERT$ has diagonals that intersect at I. Which additional statement is sufficient to prove $MERT$ is a rhombus?

(1) $\angle ERT \cong \angle RTM$ (3) $m\angle TIM = 90°$

(2) $\angle MEI \cong \angle RTI$ (4) $\overline{ME} \cong \overline{RT}$

Use this space for computations.

19 For the acute angles in right triangle ABC, $\sin(3x)° = \cos(x + 10)°$. What is the measure of the *smallest* angle in $\triangle ABC$?

(1) 5° (3) 30°

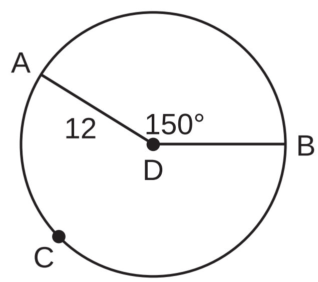
(2) 15° (4) 60°

20 Which two-dimensional shape below can *not* be a plane section of a rectangular prism?

(1) triangle (3) pentagon

(2) octagon (4) trapezoid

21 Points A, B, and C are on circle D below such that $DA = 12$ and $m\angle ADB = 150°$.



The length of $\overset{\frown}{AB}$ is

(1) 5π (3) 24π

(2) 10π (4) 60π

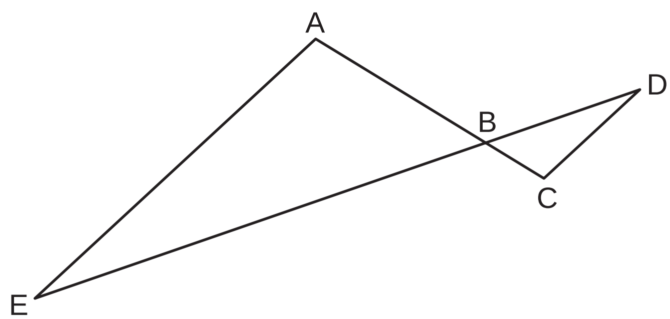
Use this space for computations.

22 The lengths of two sides of a triangle are 12 and 30. The length of the third side could be

(1) 12 (3) 28

(2) 18 (4) 42

23 In the diagram below, $\overline{AC}$ and $\overline{ED}$ intersect at B, and $\overline{AE} \parallel \overline{CD}$.



If $AB = 6$, $BC = 2$, $CD = 3$, and $BD = 4$, what is the perimeter of $\triangle ABE$?

(1) 9 (3) 21

(2) 18 (4) 27

24 On the coordinate plane, a line is dilated by a scale factor, centered at a point on the line. The image of the line has

(1) the same slope and the same y-intercept as the original line

(2) the same y-intercept but a different slope as the original line

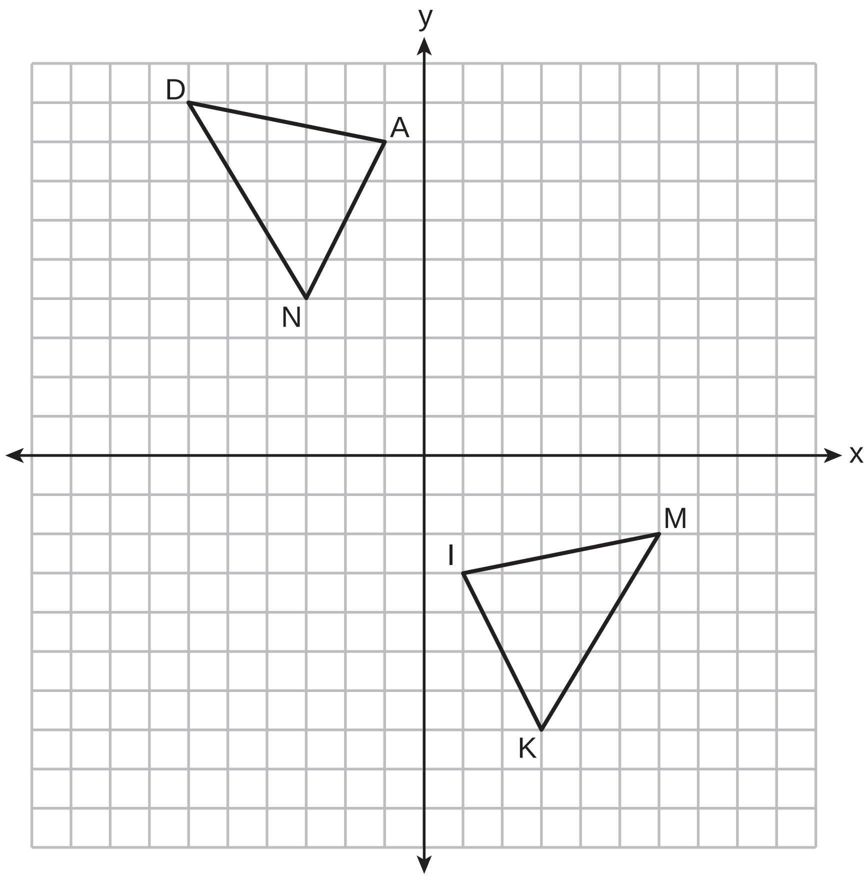
(3) the same slope but a different y-intercept as the original line

(4) a different slope and a different y-intercept than the original line

Part II

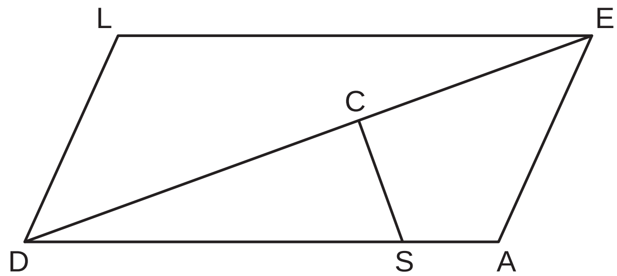
Answer all 7 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. 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 set of axes below, $\triangle DAN \cong \triangle MIK$.



Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

26 In parallelogram *LEAD* below, *C* is on $\overline{DE}$ and *S* is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.

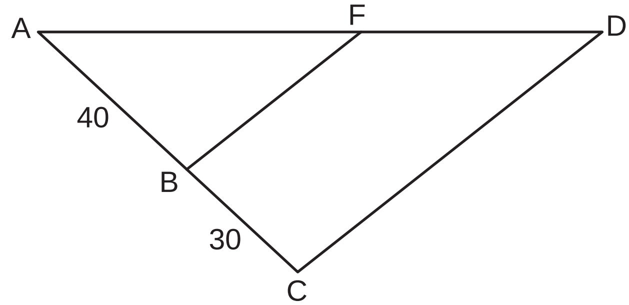


If $m\angle LED = 21°$, determine and state the measure of $\angle CSA$.

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

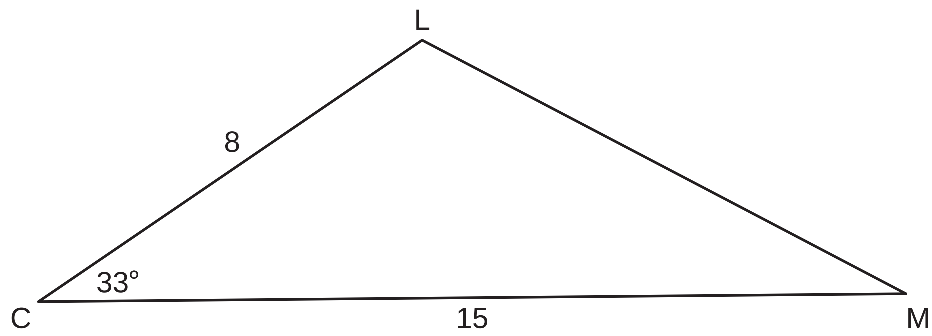
If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

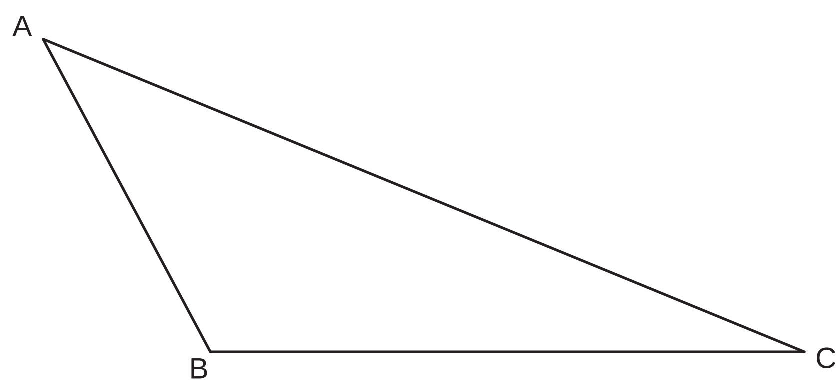
29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

[Leave all construction marks.]



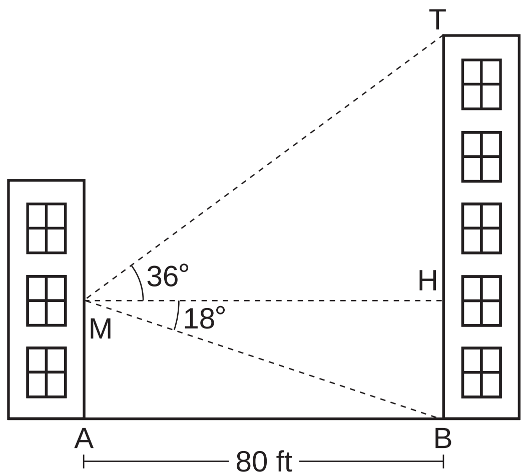
31 The diagonals of parallelogram $GRAM$ intersect at P.

If $RP = 12$ and $GA = 24$, explain why $GRAM$ is a rectangle.

Part III

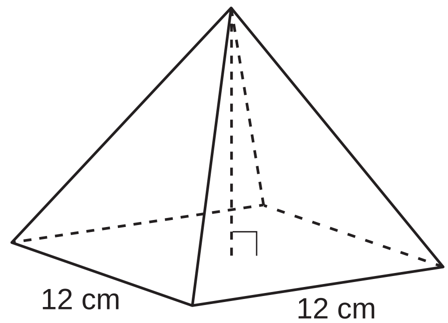
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. 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 As modeled below, Maria wants to determine the height of the building across the street from her position, M. The angle of elevation from M to the top of the building, T, is 36°. From M, the angle of depression to the base of the building, B, is 18°. The buildings are 80 feet apart.



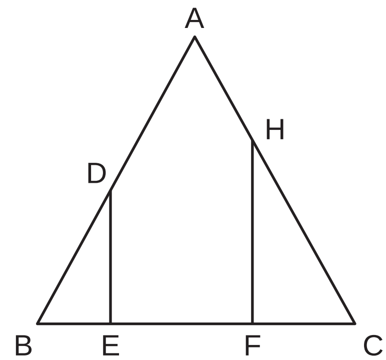
Determine and state, to the *nearest foot*, the height of the building, TB, across the street from Maria.

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

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. Utilize the information provided to determine your answer. Note that diagrams are not necessarily drawn to scale. 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. [6]

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

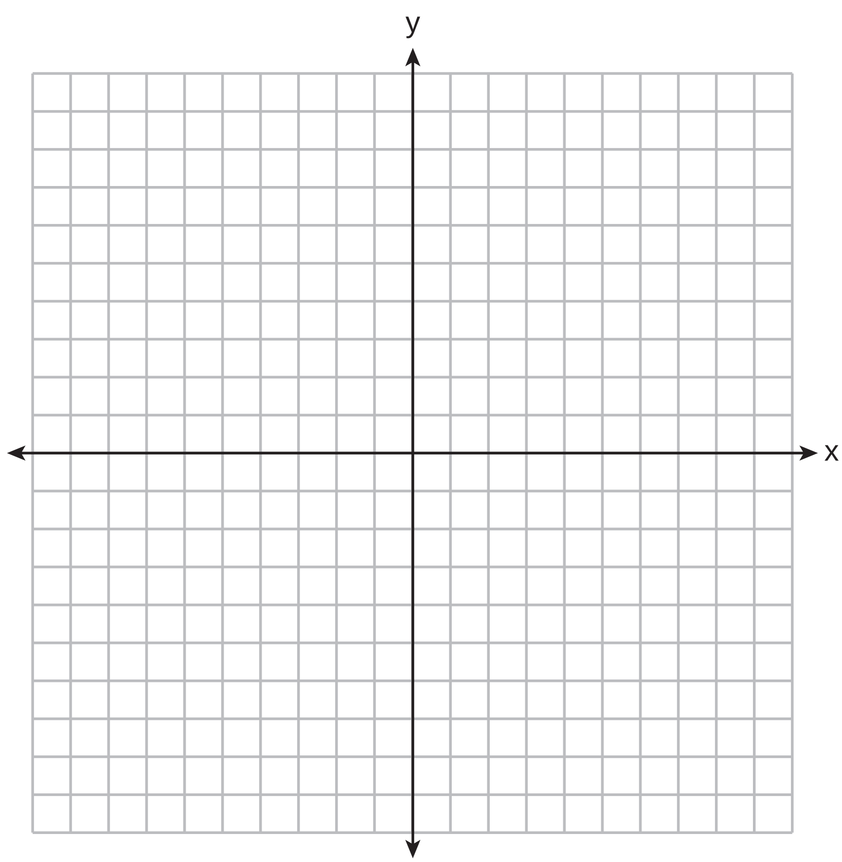
Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

Question 35 is continued on the next page.

Question 35 continued

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]



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

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Reference Sheet for Geometry

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

GEOMETRY

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GEOMETRY

The State Education Department / The University of the State of New York

Regents Examination in Geometry – June 2026

Scoring Key: Part I (Multiple-Choice Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit
Geometry	June '26	**1**	4	MC	2
Geometry	June '26	**2**	1	MC	2
Geometry	June '26	**3**	3	MC	2
Geometry	June '26	**4**	2	MC	2
Geometry	June '26	**5**	4	MC	2
Geometry	June '26	**6**	1	MC	2
Geometry	June '26	**7**	2	MC	2
Geometry	June '26	**8**	1	MC	2
Geometry	June '26	**9**	2	MC	2
Geometry	June '26	**10**	3	MC	2
Geometry	June '26	**11**	4	MC	2
Geometry	June '26	**12**	4	MC	2
Geometry	June '26	**13**	1	MC	2
Geometry	June '26	**14**	2	MC	2
Geometry	June '26	**15**	3	MC	2
Geometry	June '26	**16**	3	MC	2
Geometry	June '26	**17**	4	MC	2
Geometry	June '26	**18**	3	MC	2
Geometry	June '26	**19**	3	MC	2
Geometry	June '26	**20**	2	MC	2
Geometry	June '26	**21**	2	MC	2
Geometry	June '26	**22**	3	MC	2
Geometry	June '26	**23**	4	MC	2
Geometry	June '26	**24**	1	MC	2

Regents Examination in Geometry – June 2026

Scoring Key: Parts II, III, and IV (Constructed-Response Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit
Geometry	June '26	**25**	-	CR	2
Geometry	June '26	**26**	-	CR	2
Geometry	June '26	**27**	-	CR	2
Geometry	June '26	**28**	-	CR	2
Geometry	June '26	**29**	-	CR	2
Geometry	June '26	**30**	-	CR	2
Geometry	June '26	**31**	-	CR	2
Geometry	June '26	**32**	-	CR	4
Geometry	June '26	**33**	-	CR	4
Geometry	June '26	**34**	-	CR	4
Geometry	June '26	**35**	-	CR	6

Key
MC = Multiple-choice question CR = Constructed-response question

The chart for determining students' final examination scores for the **June 2026 Regents Examination in Geometry** will be posted on the Department's website at: **https://www.nysedregents.org/geometryre/** on the day of the examination. Conversion charts provided for the previous administrations of the Regents Examination in Geometry must NOT be used to determine students' final scores for this administration.

FOR TEACHERS ONLY

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REGENTS HIGH SCHOOL EXAMINATION

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Tuesday, June 23, 2026 — 1:15 to 4:15 p.m., only

RATING GUIDE

Updated information regarding the rating of this examination may be posted on the New York State Education Department's website during the rating period. Check this website at: https://www.nysed.gov/state-assessment/high-school-regents-examinations 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.

The Department is providing supplemental scoring guidance, the "Model Response Set," for the Regents Examination in Geometry. This guidance is intended to be part of the scorer training. Schools should use the Model Response Set along with the rubrics in the Rating Guide to help guide scoring of student work. While not reflective of all scenarios, the Model Response Set illustrates how less common student responses to constructed-response questions may be scored. The Model Response Set will be available on the Department's website at: https://www.nysedregents.org/geometryre/.

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 *Directions for Scoring Regents Examinations*.

Do *not* attempt to correct the student's work by making insertions or changes of any kind. In scoring the constructed-response 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 constructed-response questions on a student's paper. Teachers may not score their own students' answer papers. 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 constructed-response 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 website at: https://www.nysed.gov/state-assessment/high-school-regents-examinations on the day of the examination. 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.

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 *Directions for Scoring Regents Examinations*, 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 a 4-credit question and no more than 3 credits should be deducted in a 6-credit question. 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.

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.

For 4- and 6-credit questions, 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. Refer to the rubric for specific scoring guidelines.

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.

(25) **[2]** A correct sequence of rigid motions is written.

[1] An appropriate sequence of rigid motions is written, but one computational or graphing error is made.

or

[1] An appropriate sequence of rigid motions is written, but one conceptual error is made.

or

[1] An appropriate sequence of rigid motions is written, but it is incomplete or partially correct.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(26) **[2]** 111, and correct work is shown, such as a correctly labeled diagram.

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

or

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

or

[1] 111, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(27) **[2]** 353, and correct work is shown.

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

or

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

or

[1] Correct work is shown to find the volume of the section of white pine tree, but no further correct work is shown.

or

[1] 353, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(28) **[2]** 48, and correct work is shown.

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

or

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

or

[1] A correct proportion is written to find the length of $\overline{FD}$, but no further correct work is shown.

or

[1] 48, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(29) **[2]** 32.7, and correct work is shown.

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

or

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

or

[1] $\frac{1}{2}(8)(15)$ sin 33 or an equivalent expression is written, but no further correct work is shown.

or

[1] 32.7, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(30) **[2]** A correct construction is drawn showing all appropriate arcs.

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

or

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

or

[1] A correct angle bisector is constructed showing all appropriate arcs, but from a vertex other than *B*.

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

or

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(31) **[2]** A complete and correct explanation is written.

[1] An appropriate explanation is written, but one conceptual error is made.

or

[1] An appropriate explanation is written, but it is incomplete or partially correct.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, 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.

(32) **[4]** 84, and correct work is shown.

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

or

[3] Correct work is shown to find the lengths of both $\overline{TH}$ and $\overline{BH}$, but no further correct work is shown.

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

or

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

or

[2] Correct work is shown to find the length of either $\overline{TH}$ or $\overline{BH}$, but no further correct work is shown.

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

or

[1] At least one correct relevant trigonometric equation to find the lengths of $\overline{TH}$ and/or $\overline{BH}$ is written. No further correct work is shown.

or

[1] 84, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(33) **[4]** 31, and correct work is shown.

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

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

or

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

or

[2] Correct work is shown to find the mass of one pyramid in grams, but no further correct work is shown.

or

[2] Correct work is shown to find the volume of 15 kg of clay, but no further correct work is shown.

[1] Correct work is shown to find the volume of one pyramid, but no further correct work is shown.

or

[1] 31, but no work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

(34) **[4]** A complete and correct proof that includes a concluding statement is written.

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

or

[3] $\triangle DEB \sim \triangle HFC$ is proven, but no further correct work is shown.

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

or

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

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

[0] The "given" and/or the "prove" statements are rewritten in the style of a formal proof, but no further correct relevant statements are written.

or

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, 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.

(35) **[6]** $D(1, 5)$ is stated, correct work is shown to prove $ABCD$ is a parallelogram, and a correct concluding statement is written. $E(-3, 5)$ is stated, correct work is shown to prove $\triangle ABE$ is an isosceles triangle, and a correct concluding statement is written.

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

or

[5] Appropriate work is shown, but one concluding statement is missing or incorrect.

or

[5] Correct proofs are written, but $D(1, 5)$ or $E(-3, 5)$ is not stated. Correct concluding statements are written.

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

or

[4] Appropriate work is shown, but both concluding statements are missing or incorrect.

[3] Appropriate work is shown, but three or more computational or graphing errors are made.

or

[3] $D(1, 5)$ is stated, correct work is shown to prove $ABCD$ is a parallelogram, and a correct concluding statement is written.

or

[3] $E(-3, 5)$ is stated, correct work is shown to prove $\triangle ABE$ is an isosceles triangle, and a correct concluding statement is written.

[2] Correct work is shown to prove $ABCD$ is a parallelogram, and a correct concluding statement is written, but no further correct work is shown.

or

[2] Correct work is shown to prove $\triangle ABE$ is an isosceles triangle, and a correct concluding statement is written, but no further correct work is shown.

or

[2] $D(1, 5)$ and $E(-3, 5)$ are stated, but no further correct work is shown.

[1] $D(1, 5)$ or $E(-3, 5)$ is stated, but no further correct work is shown.

or

[1] Correct work is shown to prove $ABCD$ is a parallelogram, but the concluding statement is missing or incorrect. No further correct work is shown.

or

[1] Correct work is shown to find the lengths of $\overline{AB}$ and $\overline{BE}$, but no further correct work is shown.

[0] A zero response does not contain enough relevant course-level work to receive any credit, does not satisfy the criteria for one or more credits, or is a correct response that was obtained by an obviously incorrect procedure.

Map to the Learning Standards
Geometry
June 2026

Question	Type	Credits	Cluster
1	Multiple Choice	2	G-CO.A
2	Multiple Choice	2	G-CO.C
3	Multiple Choice	2	G-SRT.C
4	Multiple Choice	2	G-MG.A
5	Multiple Choice	2	G-CO.B
6	Multiple Choice	2	G-GPE.B
7	Multiple Choice	2	G-GMD.B
8	Multiple Choice	2	G-CO.C
9	Multiple Choice	2	G-SRT.C
10	Multiple Choice	2	G-CO.A
11	Multiple Choice	2	G-GPE.B
12	Multiple Choice	2	G-SRT.A
13	Multiple Choice	2	G-GPE.A
14	Multiple Choice	2	G-SRT.B
15	Multiple Choice	2	G-CO.C
16	Multiple Choice	2	G-SRT.C
17	Multiple Choice	2	G-C.A
18	Multiple Choice	2	G-CO.C
19	Multiple Choice	2	G-SRT.C
20	Multiple Choice	2	G-GMD.B
21	Multiple Choice	2	G-C.B
22	Multiple Choice	2	G-CO.C
23	Multiple Choice	2	G-SRT.B
24	Multiple Choice	2	G-SRT.A
25	Constructed Response	2	G-CO.B
26	Constructed Response	2	G-CO.C
27	Constructed Response	2	G-MG.A
28	Constructed Response	2	G-SRT.B
29	Constructed Response	2	G-SRT.D
30	Constructed Response	2	G-CO.D
31	Constructed Response	2	G-CO.C
32	Constructed Response	4	G-SRT.C
33	Constructed Response	4	G-MG.A
34	Constructed Response	4	G-SRT.B
35	Constructed Response	6	G-GPE.B

The *Chart for Determining the Final Examination Score for the June 2026 Regents Examination in Geometry* will be posted on the Department's website at: https://www.nysed.gov/state-assessment/high-school-regents-examinations no later than on the day of the examination. 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 https://www.nysed.gov/state-assessment/teacher-feedback-state-assessments.
2. Click Regents Examinations.
3. Complete the required demographic fields.
4. Select the test title from the Regents Examination dropdown list.
5. Complete each evaluation question and provide comments in the space provided.
6. Click the SUBMIT button at the bottom of the page to submit the completed form.

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

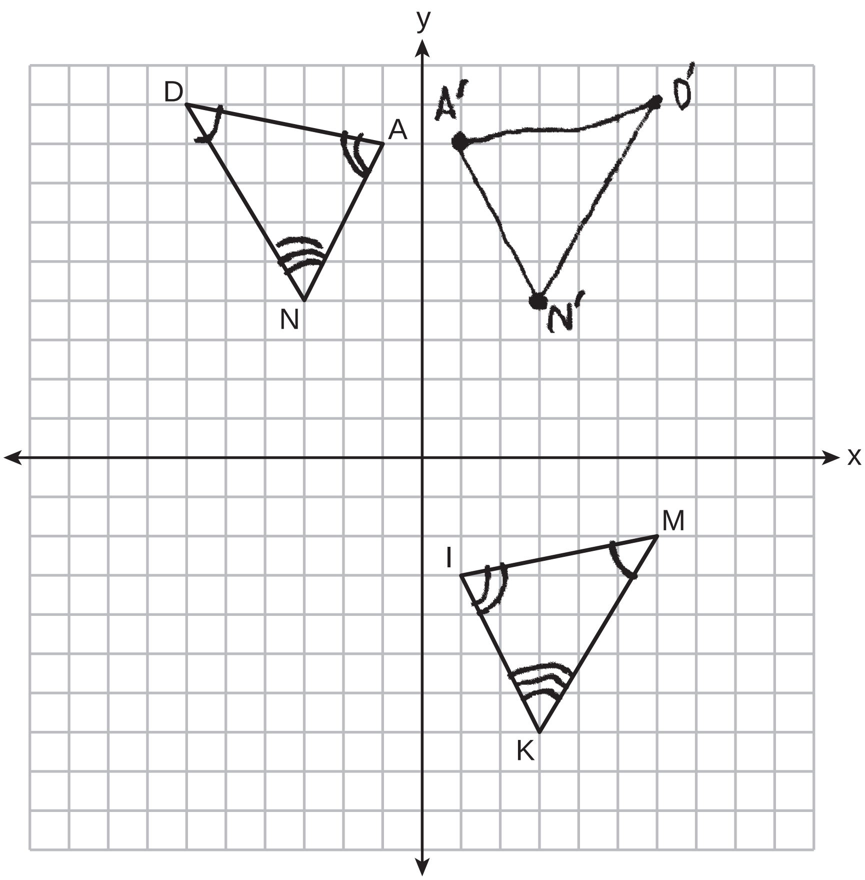
Tuesday, June 23, 2026 — 1:15 to 4:15 p.m., only

MODEL RESPONSE SET

Table of Contents

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



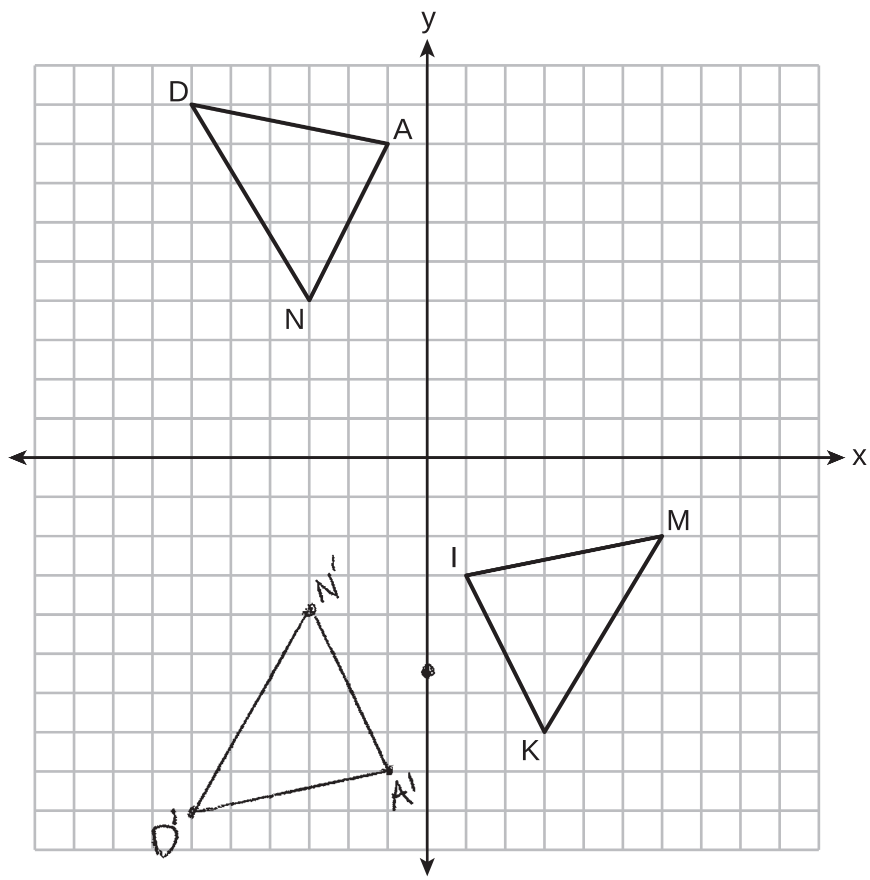
Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

1st: Reflect $\triangle DAN$ over the y-axis
2nd: Translate $\triangle D'A'N'$ down 11 units

Score 2: The student gave a complete and correct response.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



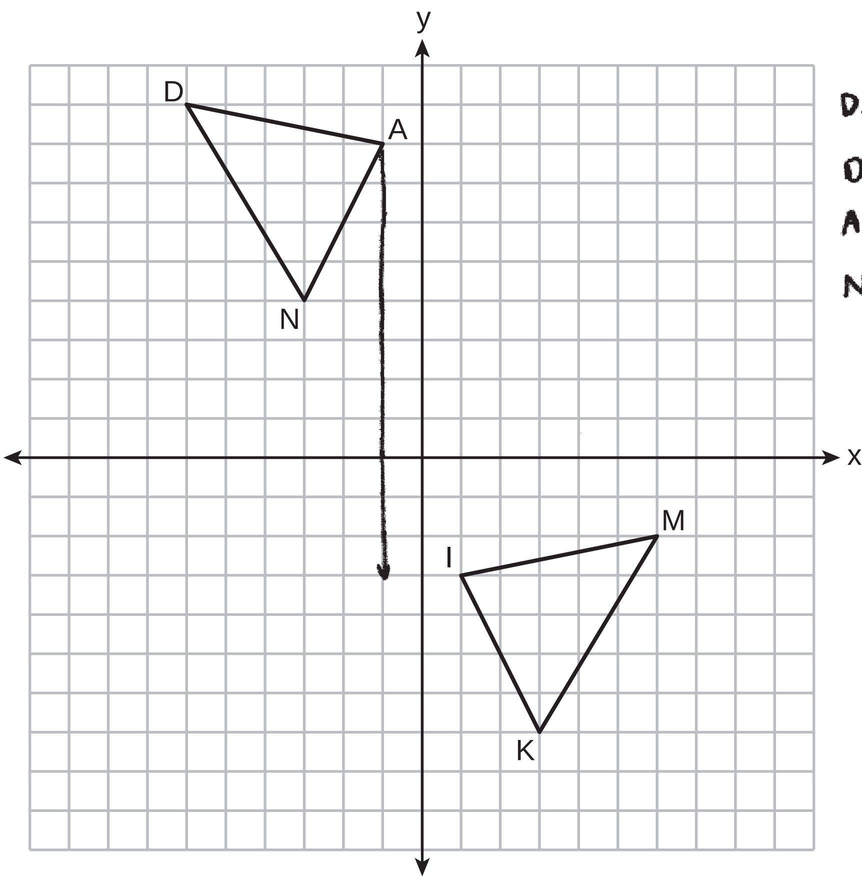
Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

Reflect $\triangle DAN$ over the x-axis
Then reflect it through the point $(0, -5.5)$.

Score 2: The student gave a complete and correct response.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



DAN

D(-6,9)

A(-1,8)

N(-3,4)

Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

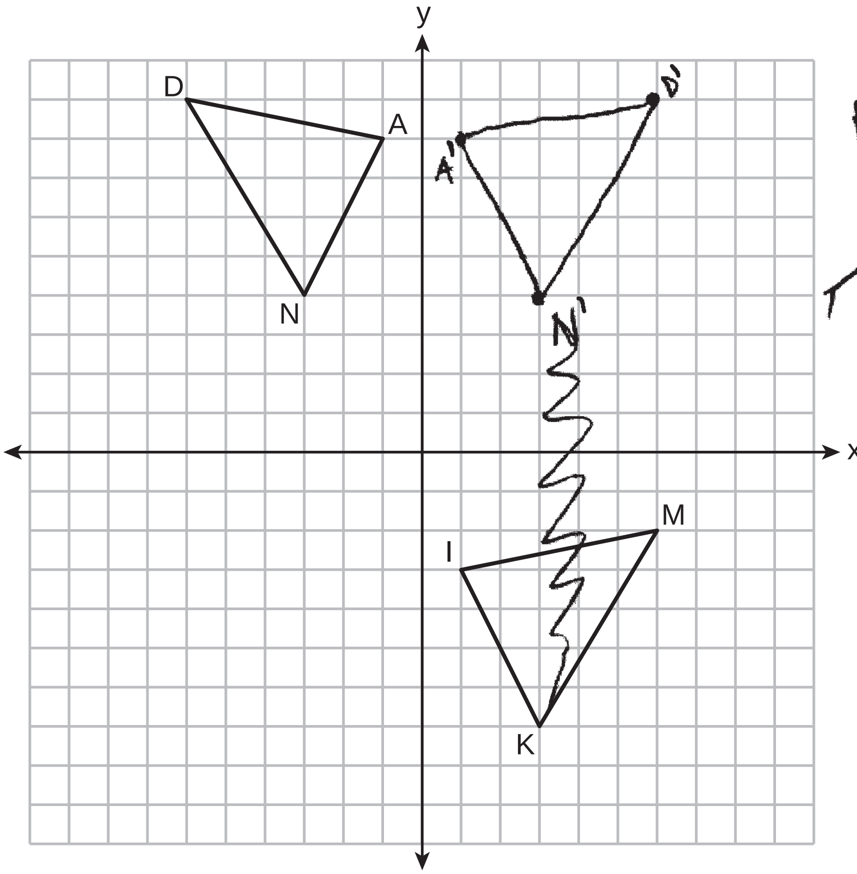
- a translation 11 units down

- a reflection over the y-axis

Score 2: The student gave a complete and correct response.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



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

$T_{(0,-11)}$

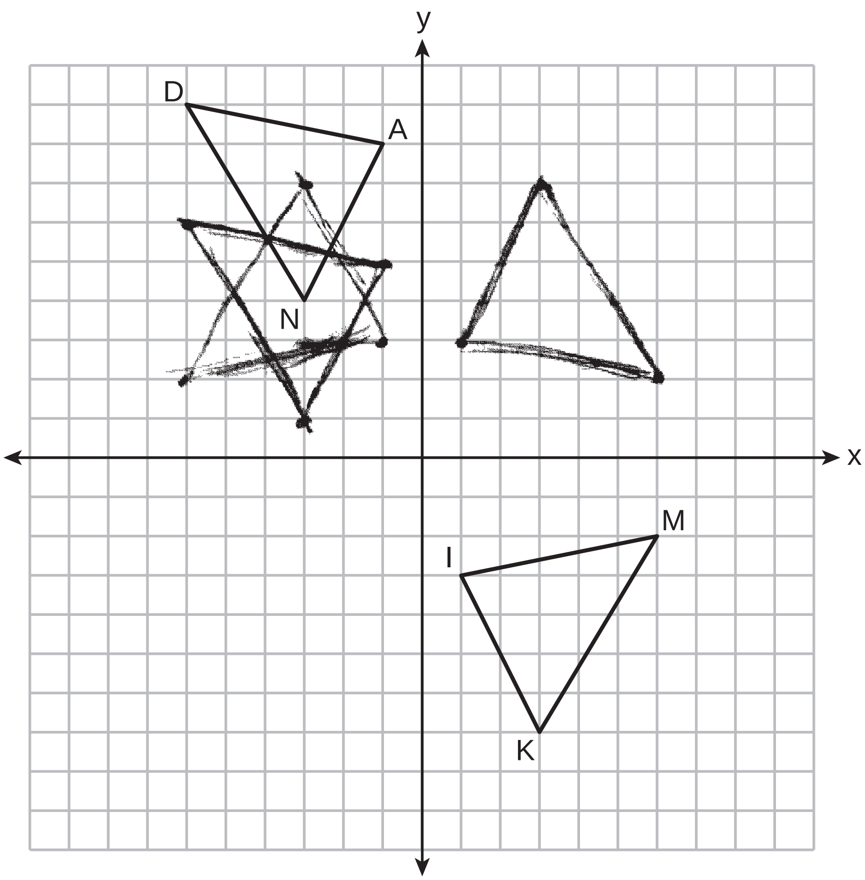
Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

$[T_{(0,-11)} \circ r_{(y\text{-axis})}]$

Score 2: The student gave a complete and correct response.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

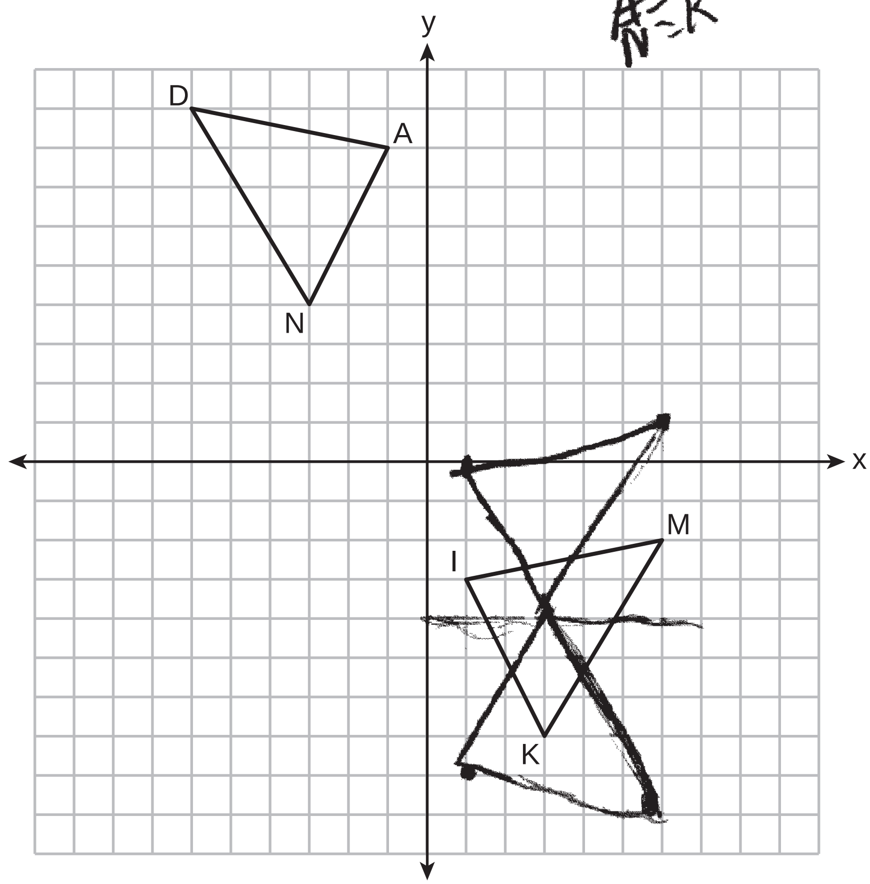
Reflection Across the X axis
Reflection Across the y axis
Reflection across y = 4
Translation up 3 units

Score 1: The student mapped $\triangle MIK$ onto $\triangle DAN$.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.

D=M
A=I
N=K



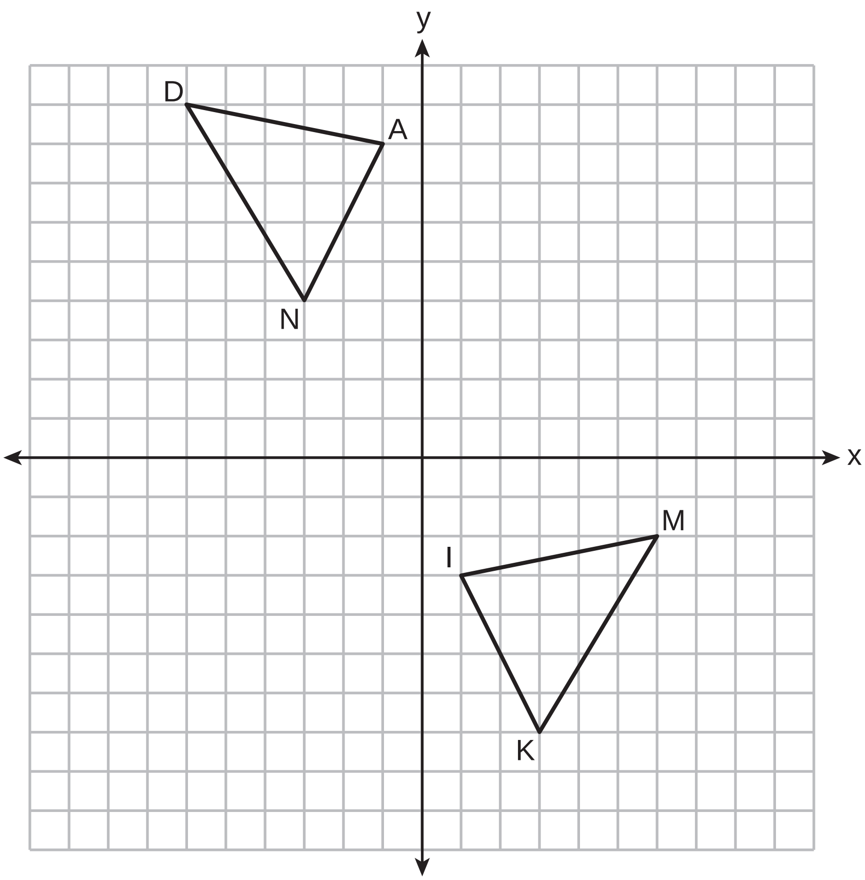
Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

- rotation 180°
- reflection over y = -4
- Translation <0, -3>

Score 1: The student did not state the center of rotation.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



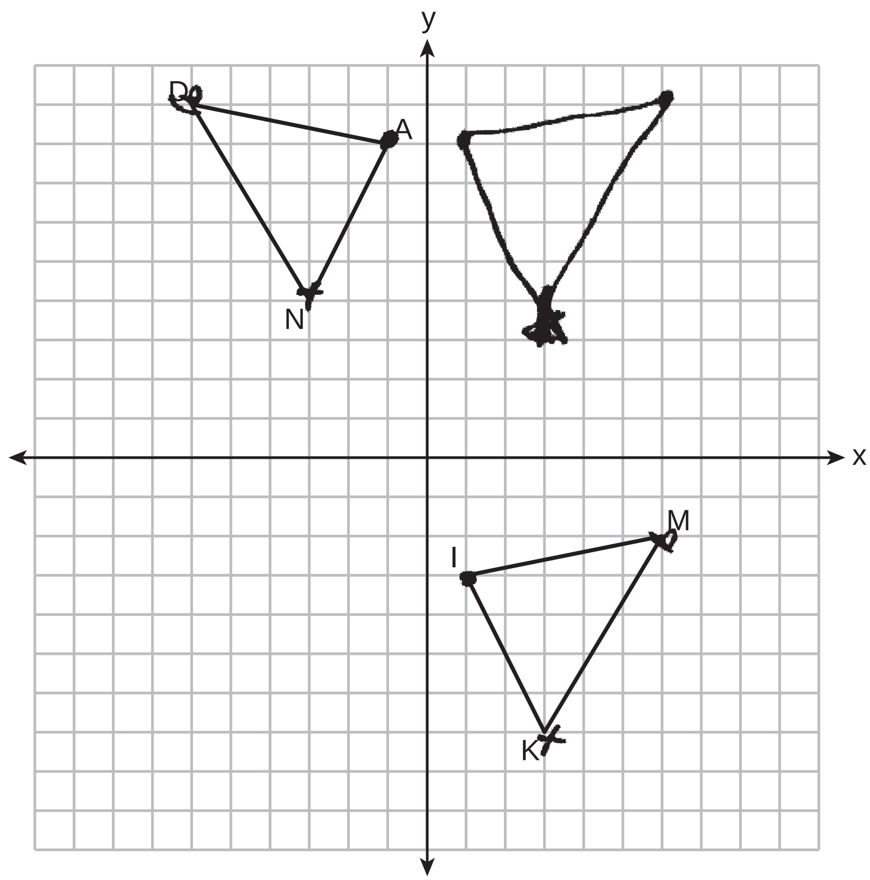
Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

A reflection over the y-axis to bring ΔDAN into quadrant I. A translation

Score 1: The student wrote an incomplete description of the translation.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

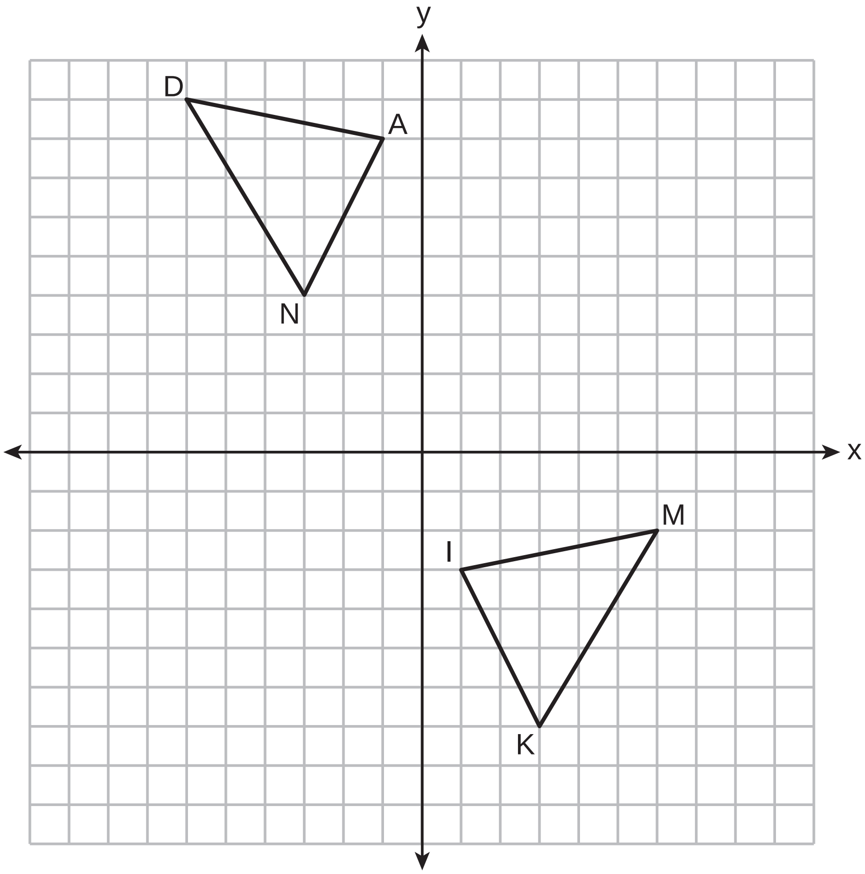
Reflect over x

Down 10 units

Score 0: The student did not show enough relevant course-level work to receive any credit.

Question 25

25 On the set of axes below, $\triangle DAN \cong \triangle MIK$.



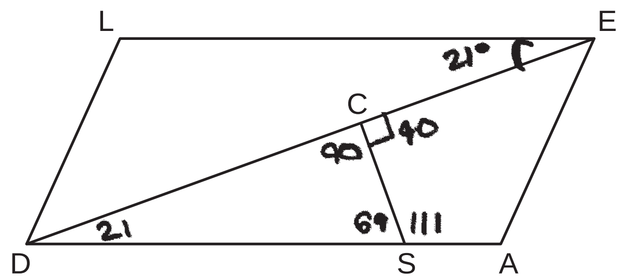
Describe a sequence of rigid motions that maps $\triangle DAN$ onto $\triangle MIK$.

rotation by 180° around the origin

Score 0: The student did not show enough relevant course-level work to receive any credit.

Question 26

26 In parallelogram *LEAD* below, *C* is on $\overline{DE}$ and *S* is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.



If $m\angle LED = 21°$, determine and state the measure of $\angle CSA$.

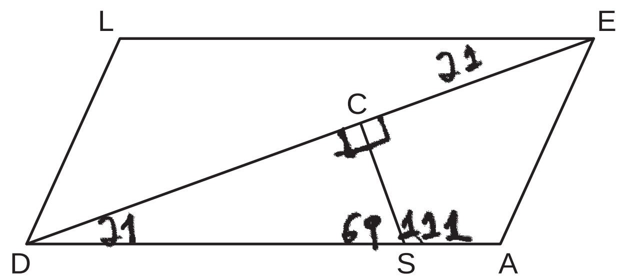
$\boxed{111°}$

$$\begin{array}{r} 21 \\ +90 \\ \hline 111 \end{array} \quad \begin{array}{r} 180 \\ -111 \\ \hline 69 \end{array} \quad \begin{array}{r} 180 \\ -\ 69 \\ \hline 111 \end{array}$$

Score 2: The student gave a complete and correct response.

Question 26

26 In parallelogram *LEAD* below, *C* is on $\overline{DE}$ and *S* is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.



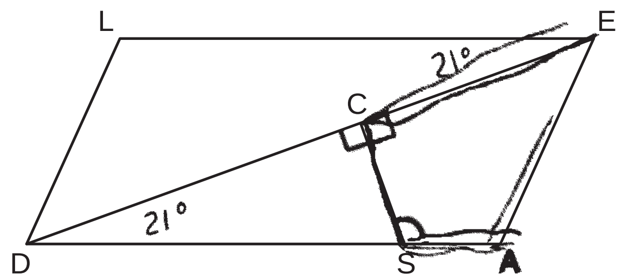
If m$\angle LED$ = 21°, determine and state the measure of $\angle CSA$.

m<CSA = 111°

Score 2: The student gave a complete and correct response.

Question 26

26 In parallelogram *LEAD* below, *C* is on $\overline{DE}$ and *S* is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.



If m$\angle LED = 21°$, determine and state the measure of $\angle CSA$.

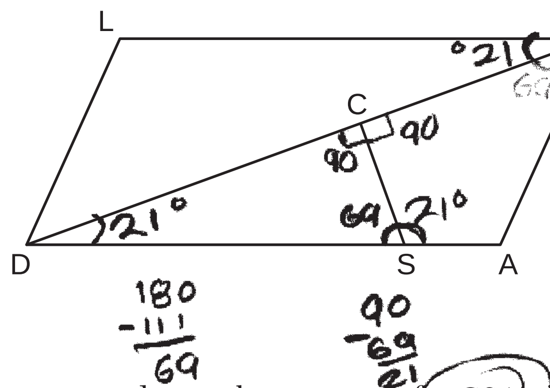
90 + 21 = 111

$\boxed{m\angle CSA = 111°}$

Score 2: The student gave a complete and correct response.

Question 26

26 In parallelogram *LEAD* below, *C* is on $\overline{DE}$ and *S* is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.



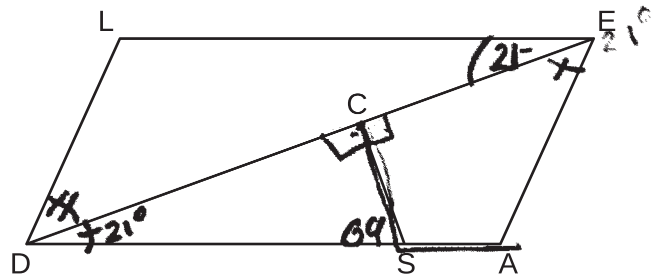
If m∠*LED* = 21°, determine and state the measure of ∠*CSA*.

∠CSA = 21°

Score 1: The student made an error when determining m∠*CSA*.

Question 26

26 In parallelogram *LEAD* below, *C* is on $\overline{DE}$ and *S* is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.



If m$\angle LED = 21°$, determine and state the measure of $\angle CSA$.

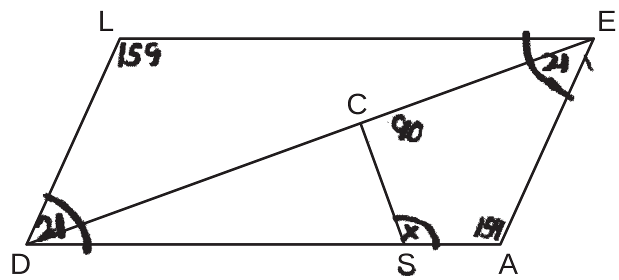
$180 - 90 - 21 = 69°$ $\angle DSC = 69°$

$\angle CDS = 21°$ b/c of alternate interior angles are ≅ in a parallelogram.

Score 1: The student showed correct work to determine m$\angle CSD$, but did not determine m$\angle CSA$.

Question 26

26 In parallelogram $LEAD$ below, C is on $\overline{DE}$ and S is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.



If m$\angle LED = 21°$, determine and state the measure of $\angle CSA$.

$360 = 159 + 90 + x + 10.5$

$360 = 259.5 + x$

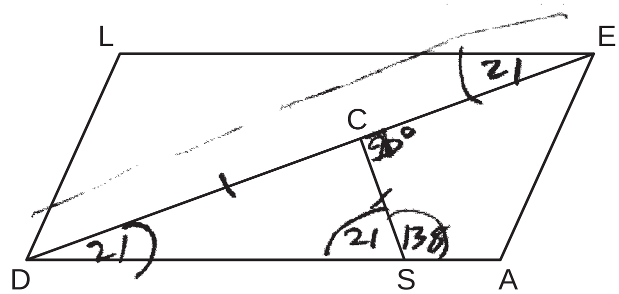
$-259.5 \quad -259.5$

$100.5 = x$

$m\angle CSA = 100.5°$

Score 0: The student did not show enough correct work to receive any credit.

26 In parallelogram *LEAD* below, *C* is on $\overline{DE}$ and *S* is on $\overline{DA}$ such that $\overline{SC} \perp \overline{DE}$.



If m$\angle LED = 21°$, determine and state the measure of $\angle CSA$.

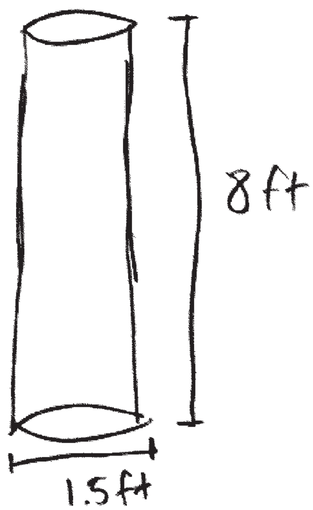
$\boxed{\angle CSA = 138°}$

Score 0: The student did not show enough correct work to receive any credit.

Question 27

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.



$d = 2r$

$r = \frac{d}{2}$

$r = \frac{1.5 \text{ ft}}{2}$

$r = 0.75 \text{ ft}$

$V_{cylinder} = \pi r^2 h$

$V_{cylinder} = \pi (0.75)^2 (8)$

$\text{Weight} = \frac{25 \text{ lbs}}{1 \cancel{\text{ft}^3}} \left(\pi (0.75)^2 (8)\right) \cancel{\text{ft}^3}$

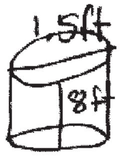
$\boxed{\text{Weight} = 353 \text{ lbs}}$

Score 2: The student gave a complete and correct response.

Question 27

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.



$A = \pi r^2$
$= \pi .75^2$
$= 1.7671...$

$V = Bh$
$= 1.76... \times 8$
$= 14.137...$

$\frac{25 \text{lbs}}{1 \text{ft}^3} = \frac{x}{14.137 \text{ft}^3}$

$x = 353.4...$

353 lbs

Score 2: The student gave a complete and correct response.

Question 27

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.

$V = \pi r^2 h$

$V = \pi(0.75^2)8$

$V = 4.5\pi$

$\frac{4.5\pi}{1} * \frac{25}{1} = \boxed{353.\text{lbs}}$

Score 2: The student gave a complete and correct response.

Question 27

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.

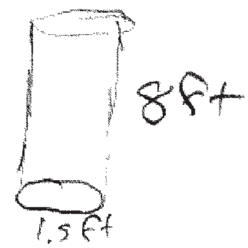
$V = Bh$

$V = \pi r^2(8)$

$V = \pi 2.25(8)$

$V = \frac{56.549 \text{ ft}^3}{1} \times \frac{25 \text{ lbs}}{1 \text{ ft}^3} = 1413.7167 \text{ lbs}$

$\boxed{1414 \text{ lbs}}$

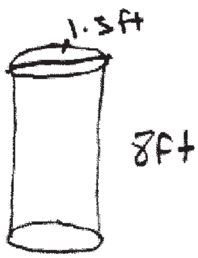


Score 1: The student made an error using a radius of 1.5 when determining the volume.

Question 27

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.



$V = B \times h$

$V = (\pi r^2)\ 8$

$(\pi .5625)\ 8$

$V = 14$

$$\begin{array}{r} 14 \\ \times\ 25 \\ \hline 350 \end{array}$$

the weight of this section is 350 pounds.

Score 1: The student made a rounding error when determining the volume of the section of white pine.

Question 27

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

0.75

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*. D

$D = \frac{1.5}{2}$

$r = 0.75$

$h = 8$

$D = \frac{m}{v}$ $\quad m = D \cdot v$

$V = \frac{m}{D}$

$V = \pi(0.75)^2 \cdot 8$

$V = \pi 0.5625 \cdot 8$

$V = 4.5\pi$

$D = \frac{25}{4.5\pi} =$

$D = 5.555555556\pi$

$D = 17.45329252$

$\boxed{D = 17 \text{ pounds}}$

Score 1: The student correctly determined the volume.

Question 27

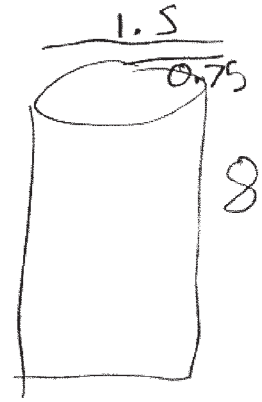
27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.

$(0.75^2\pi)\cdot 8 = 5.964117303$

$5.96\ldots \cdot 25 = 149.1029$

149 pounds



Score 1: The student made an error when determining the volume, but found an appropriate weight.

27 A section of tree trunk from a white pine tree can be modeled by a cylinder. The diameter of the trunk is 1.5 feet, and the height of this section is 8 feet.

If white pine weighs 25 pounds per cubic foot, determine and state the weight of this section of the white pine tree, to the *nearest pound*.

$V = 7.068$

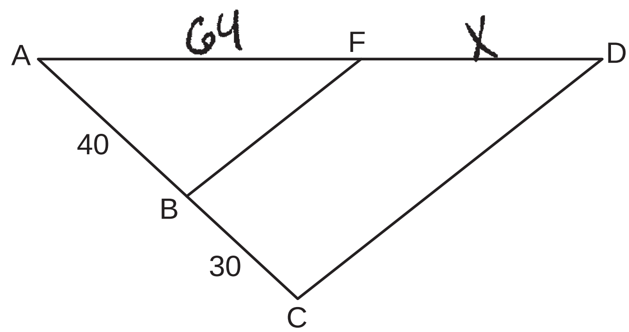
$$\begin{array}{r} 25 \\ \times\ 7.068 \\ \hline \end{array}$$

$W = 176.7$ lbs

Score 0: The student made an error when determining the volume of the section of tree trunk and made a rounding error.

Question 28

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

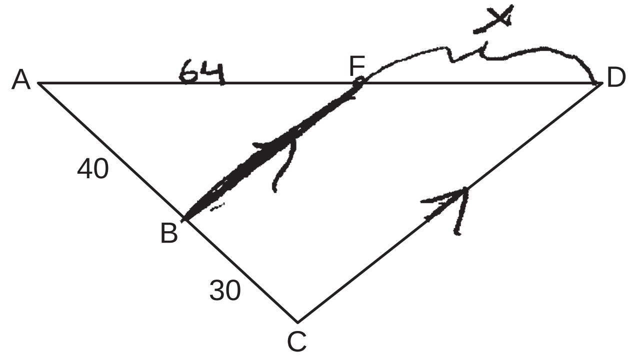
$$\frac{64}{40} = \frac{x}{30}$$

$$\frac{40x}{40} = \frac{1920}{40}$$

$$x = 48$$

Score 2: The student gave a complete and correct response.

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

$$\frac{64}{x} = \frac{40}{30}$$

$$\frac{40x}{40} = \frac{1920}{40}$$

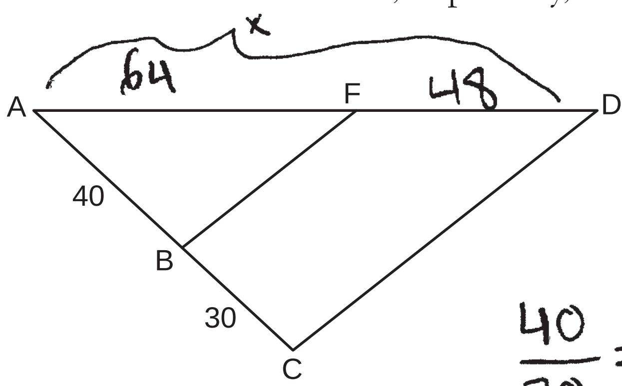
$x = 48$

$\boxed{FD = 48}$

Score 2: The student gave a complete and correct response.

Question 28

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



$$\frac{40}{70} = 57.14285\%$$

If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

$$\frac{57.14285}{100} = \frac{64}{x}$$

$$6400 = 57.14285x$$

$$112 = x$$

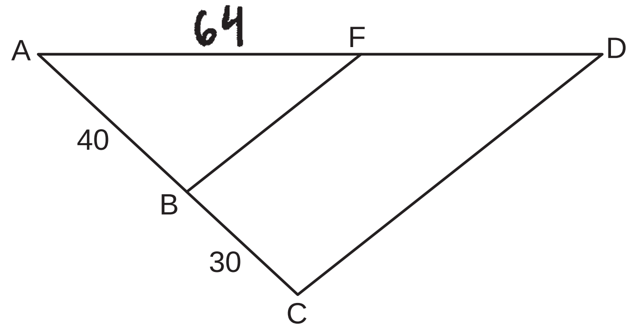
$$112 - 64 =$$

$$48$$

Score 2: The student gave a complete and correct response.

Question 28

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

$$\frac{40}{70} = \frac{64}{x}$$

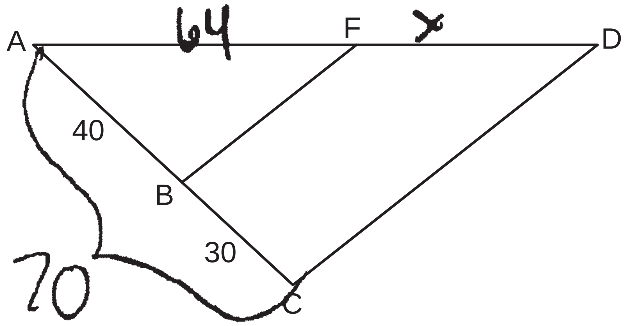
$$\frac{\cancel{40}x}{\cancel{40}} = \frac{4480}{40}$$

$$x = 112$$

$$\boxed{112}$$

Score 1: The student correctly determined the length of $\overline{AD}$.

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

$$\frac{64}{40} = \frac{64+x}{70}$$

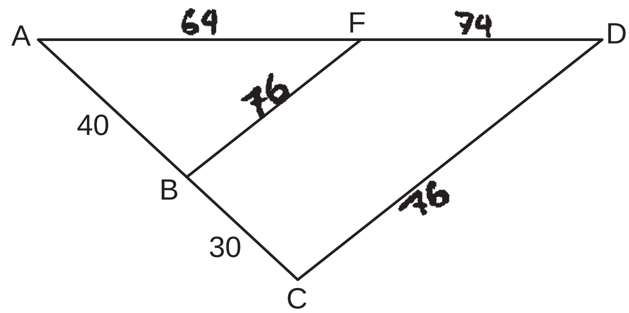
$$\frac{2560x}{2560} = \frac{4480}{2560}$$

$$x = 1.75$$

Score 1: The student wrote a correct proportion, but made an error when cross-multiplying.

Question 28

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

AB + AF $(40+64)-180 = 76$

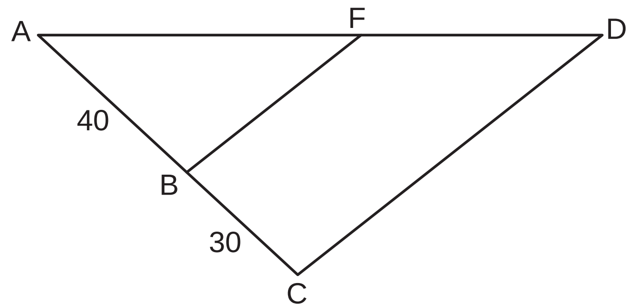
BC + CD $(30+76)-180 = 74$

$\boxed{\overline{BF} \parallel \overline{CD}}$

Score 0: The student did not show enough correct relevant work to receive any credit.

Question 28

28 In $\triangle ADC$ below, points B and F are on $\overline{AC}$ and $\overline{AD}$, respectively, such that $AB = 40$, $BC = 30$, and $\overline{BF}$ is drawn.



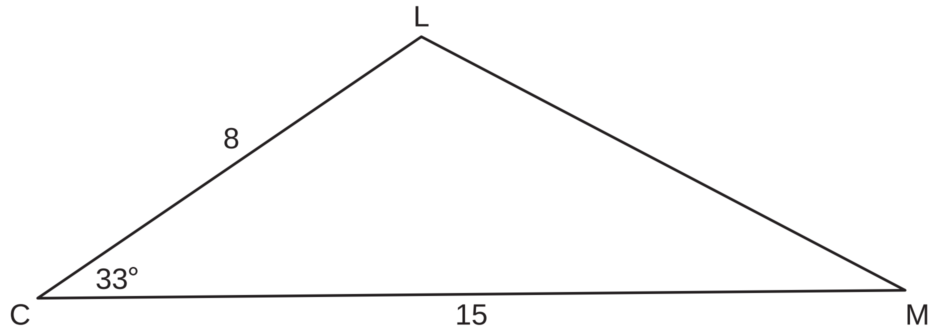
If $AF = 64$, determine and state the length of $\overline{FD}$ that would prove $\overline{BF} \parallel \overline{CD}$.

$$40+30=70$$
$$\begin{array}{r} 70 \\ +64 \\ \hline \boxed{114} \end{array}$$

Score 0: The student did not show enough correct relevant work to receive any credit.

Question 29

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

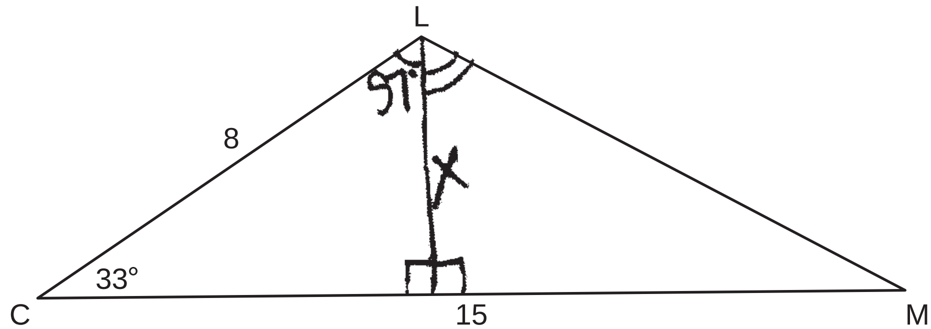
$\frac{1}{2}(8)(15)\sin 33$

$A = 32.7$

Score 2: The student gave a complete and correct response.

Question 29

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

$$\frac{\cos(57)}{1} = \frac{x}{8} \qquad x \approx 4.357$$

$$\frac{15 \cdot 4.357}{2} \approx 32.7$$

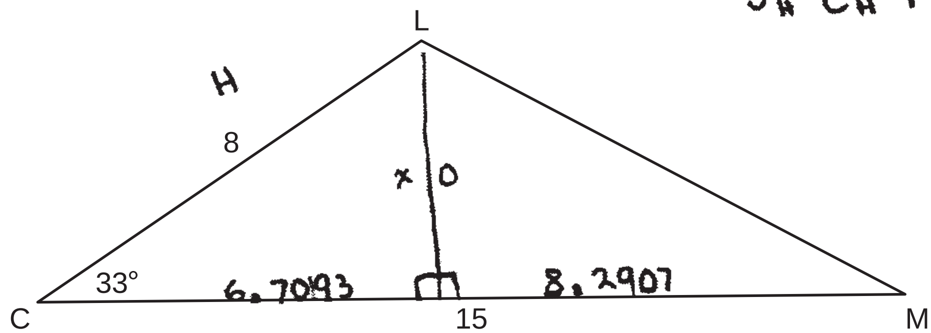
$$\boxed{\text{area of } \triangle CLM \approx 32.7}$$

Score 2: The student gave a complete and correct response.

Question 29

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.

S $\frac{O}{H}$ C $\frac{A}{H}$ T $\frac{O}{A}$



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

$15 - 6.7093 = 8.2907$

$\frac{\sin 33}{1} = \frac{x}{8}$

$x = \sin 33 (8)$

$x = 4.3571$

$(4.3571)^2 + b^2 = (8)^2$

$18.9843 + b^2 = 64$

$-18.9843 \quad -18.9843$

$\sqrt{b^2} = \sqrt{45.0157}$

$b = 6.7093$

$A = \frac{1}{2}bh$

$A = \frac{1}{2}(6.7093)(4.3571)$

$A = 14.6165$

$A = \frac{1}{2}bh$

$A = \frac{1}{2}(8.2907)(4.3571)$

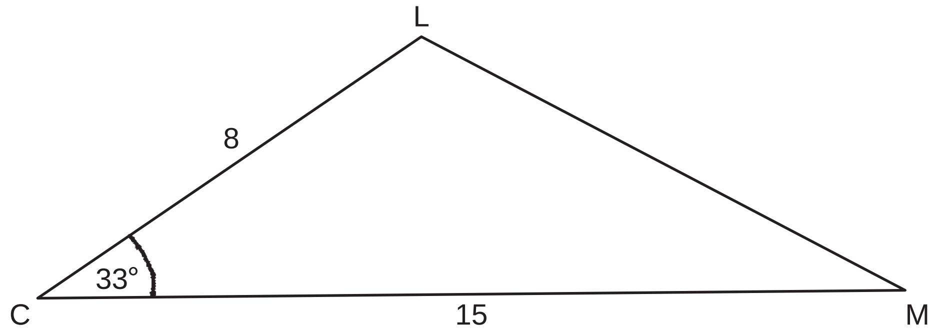
$A = 18.0617$

$18.0617 + 14.6165 = 32.7 \text{ units}^2$

Score 2: The student gave a complete and correct response.

Question 29

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

$A_\Delta = ab\sin C$

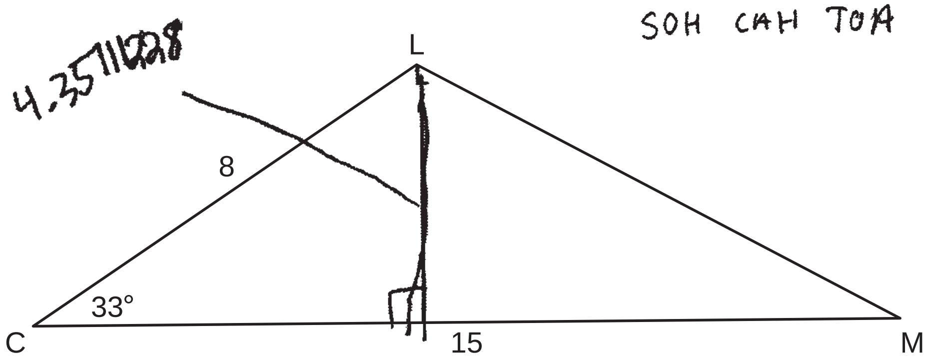
$A_\Delta = 8 \cdot 15 \cdot \sin 33$

$A_\Delta \approx 65.4$

Score 1: The student made an error by not using $\frac{1}{2}$ in the formula, but found an appropriate answer.

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.

SOH CAH TOA



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

$A = \frac{1}{2}(b)(h)$

$\frac{\sin(33)}{1} = \frac{x}{8}$

$x = 4.35711228$

$A = \frac{1}{2}(15)(4.35711228)$

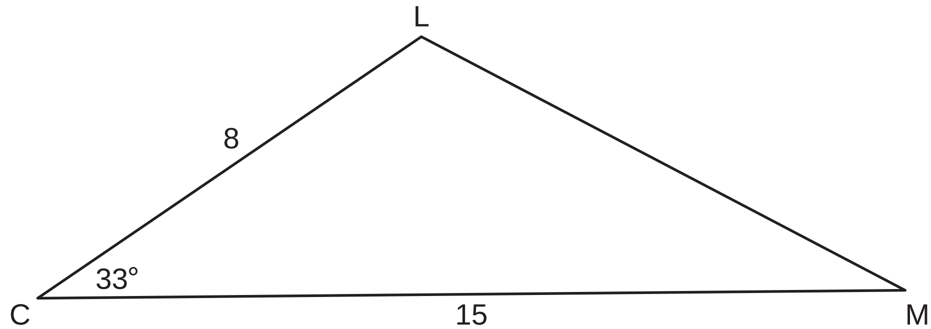
$A =$

$\boxed{A \approx 32.68 \text{ units}^2}$

Score 1: The student made a rounding error.

Question 29

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

$A = \frac{1}{2} b \cdot h$

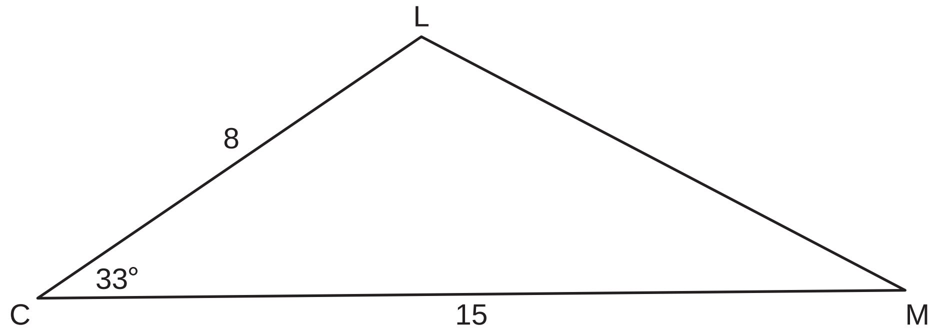
$A = \left(\frac{1}{2}\right)(15)(8)$

$A = 60.0$

Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 29

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.



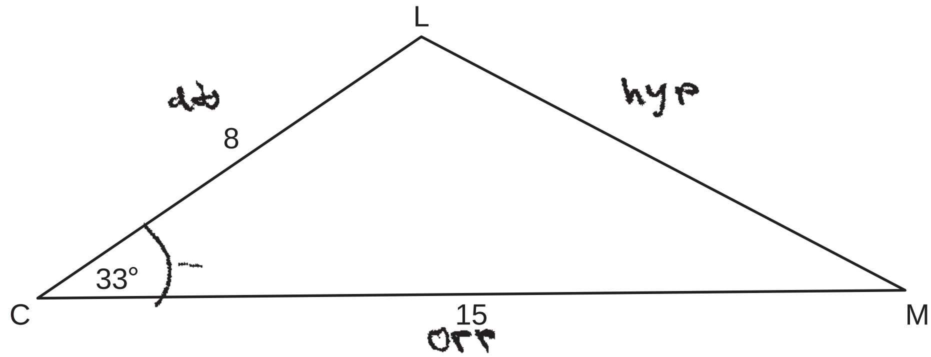
Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

$A = \frac{1}{2}(15)(33)(\tan 12) = 8.6$

Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 29

29 In $\triangle CLM$ below, $m\angle C = 33°$, $CL = 8$, and $CM = 15$.



Determine and state, to the *nearest tenth*, the area of $\triangle CLM$.

$a^2+b^2=c^2$

$8^2+15^2=c^2$

$\downarrow$

$\frac{289}{33}=c$ or $\sqrt{289}=\underline{17}$

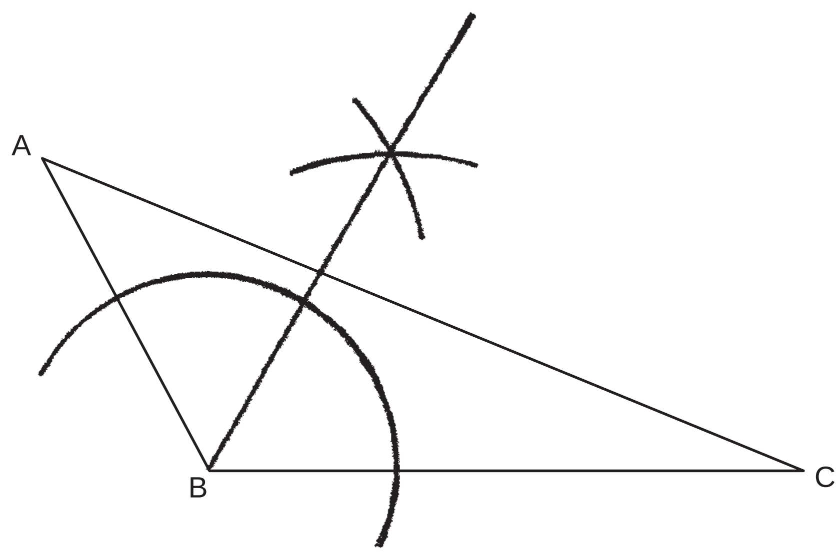
$c=\underline{8.8}$

Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 30

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

[Leave all construction marks.]

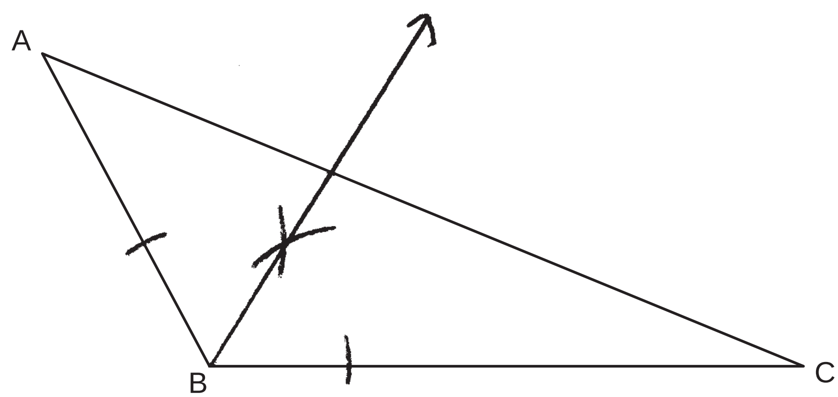


Score 2: The student gave a complete and correct response.

Question 30

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

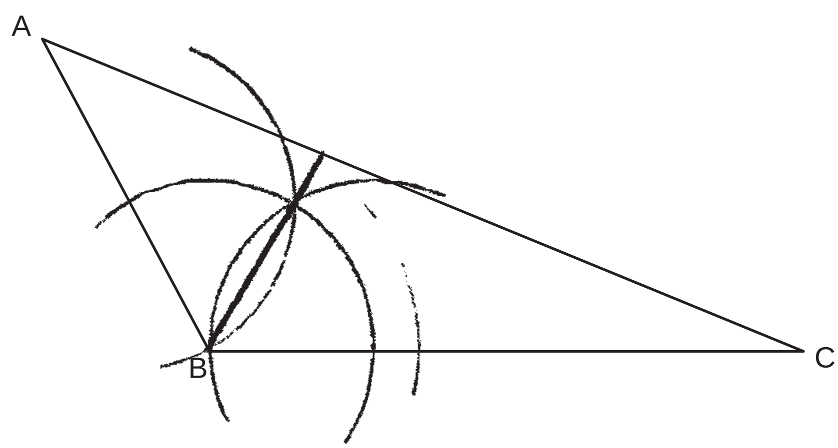
[Leave all construction marks.]



Score 2: The student gave a complete and correct response.

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

[Leave all construction marks.]

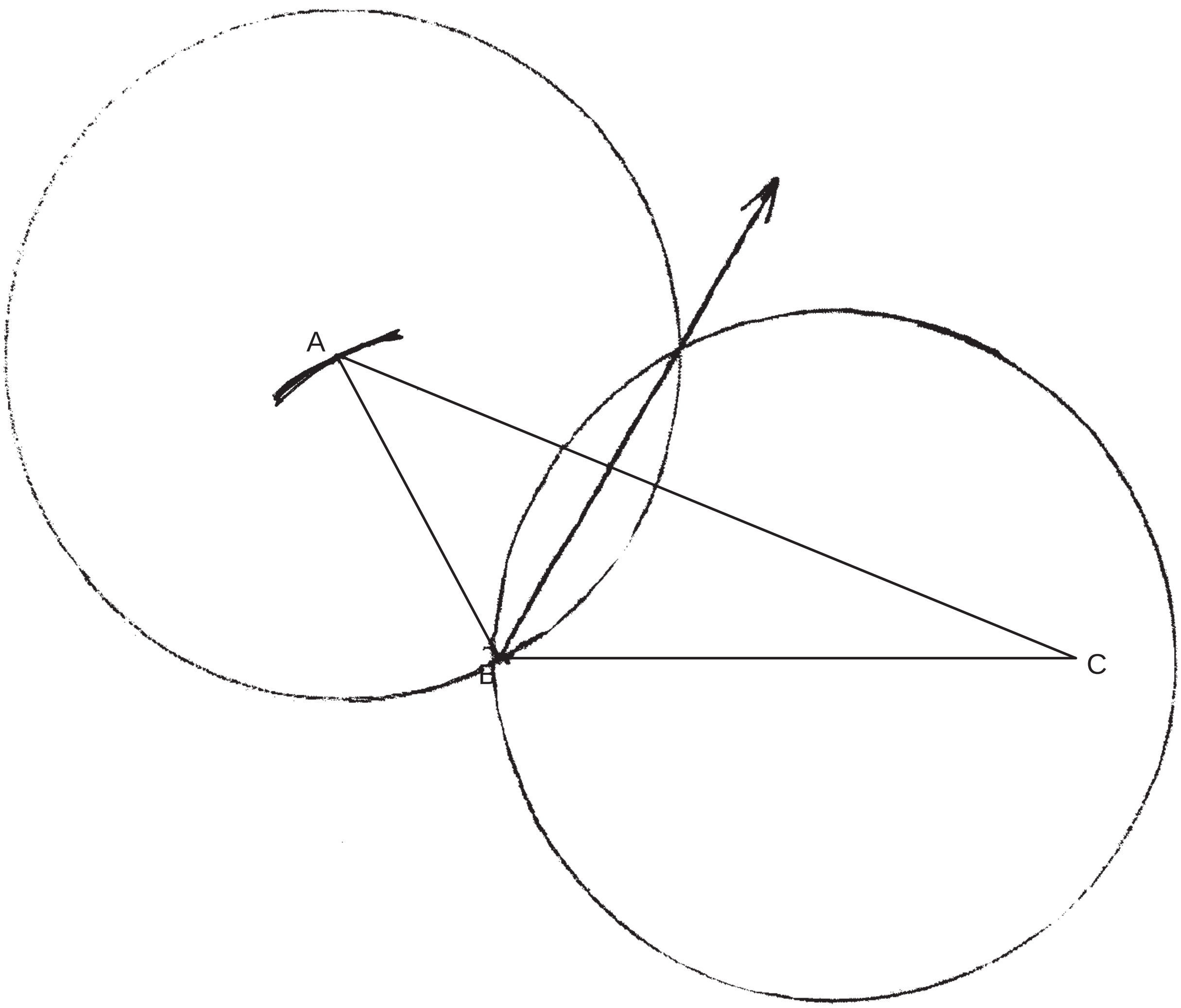


Score 2: The student gave a complete and correct response.

Question 30

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

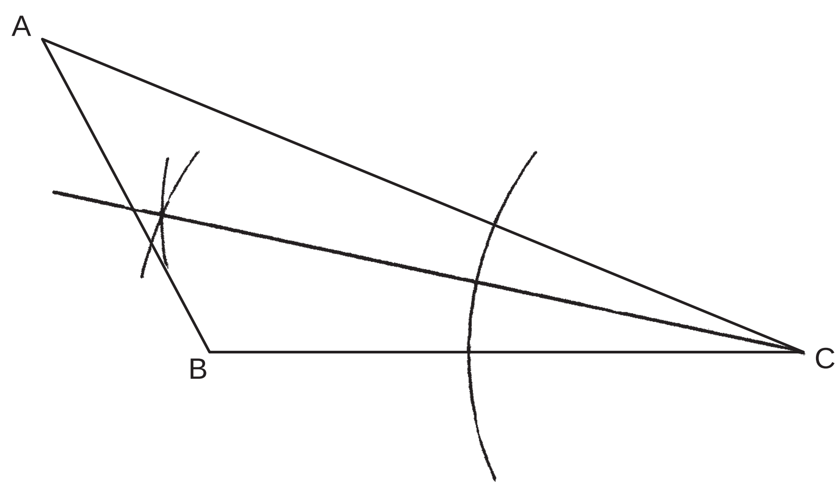
[Leave all construction marks.]



Score 1: The student did not construct the arc on $\overline{BC}$ that is the center of the second circle.

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

[Leave all construction marks.]

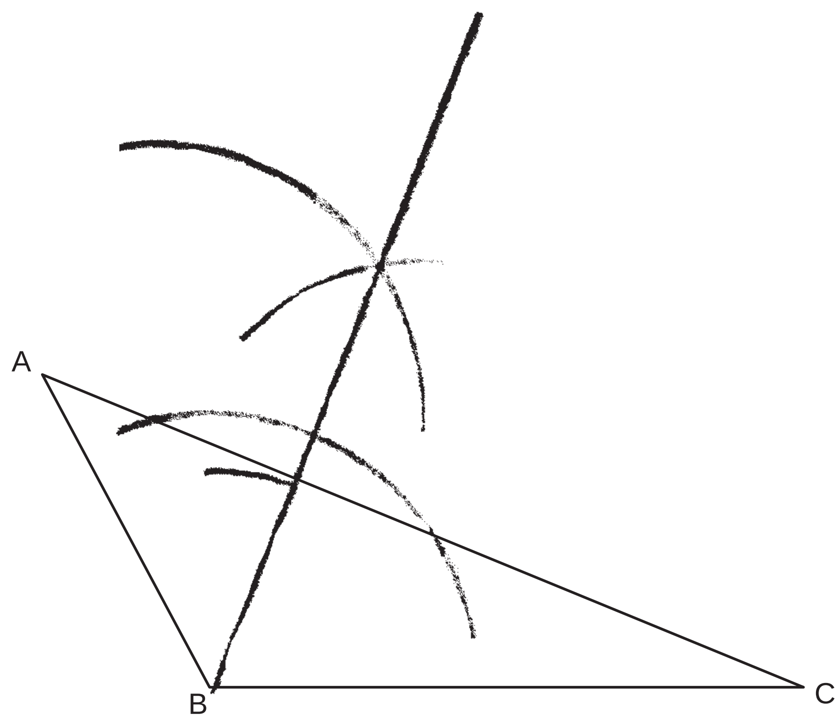


Score 1: The student constructed the bisector of $\angle C$.

Question 30

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

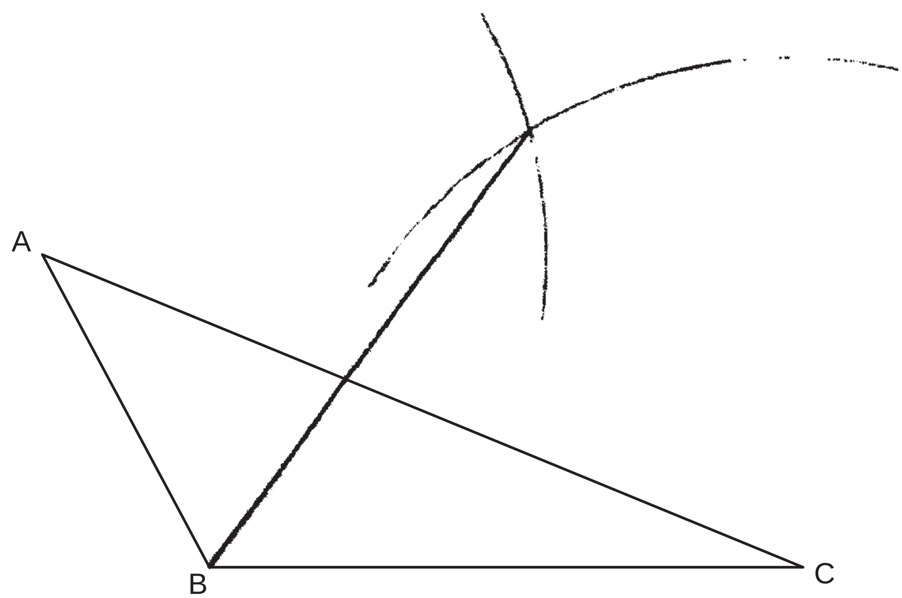
[Leave all construction marks.]



Score 0: The student constructed an altitude from vertex B.

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

[Leave all construction marks.]

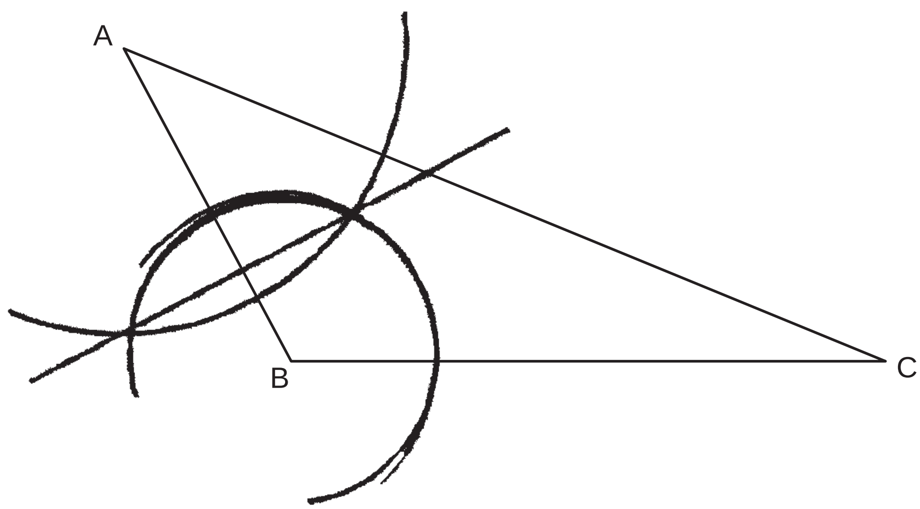


Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 30

30 In the diagram of $\triangle ABC$ below, use a compass and straightedge to construct the angle bisector of $\angle ABC$.

[Leave all construction marks.]

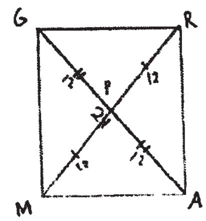


Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 31

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.



GRAM is ▱, RP=12, GA=24

$\overline{MP} \cong \overline{PR}$ and $\overline{GP} \cong \overline{PA}$ because diagonals bisect each other in parallelograms.

GP=12, PA=12 since segment bisectors divide a segment into two equal halves.
24/2=12

Since $\overline{MP} \cong \overline{PR}$, MP=12

GP+PA=MP+PR, so diagonals $\overline{GA} \cong \overline{MR}$.
12+12=12+12

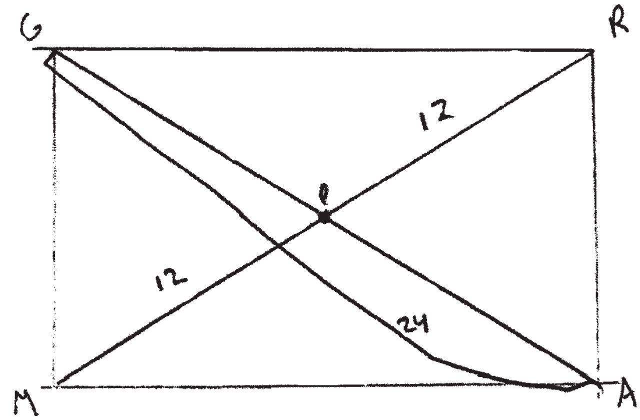
GRAM is a rectangle since rectangles are parallelograms with ≅ diagonals.

Score 2: The student gave a complete and correct response.

Question 31

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.



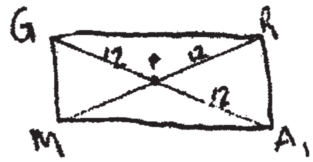
Statement	Reason
1) GRAM is a parallelogram RP=12 GA=24	1) Given
2) $\overline{RP} \cong \overline{MP}$	2) Parallelograms diagonals bisect eachother, bisector cuts segment into 2 ≅ parts.
3) $\overline{RM} \cong \overline{GA}$	3) 24 = 24
4) GRAM is a rectangle	4) PGRAM w/ ≅ diagonals is a rectangle

Score 2: The student gave a complete and correct response.

Question 31

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.



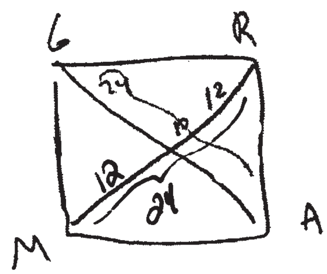
12+12=24

We know that GRAM is a rectangle because the diagonals of a parallelogram bisect each other, so if diagonal GA = 24 and the diagonals intersect at P GP = 12 PA = 12 sinse 24÷2=12. And sinse PR = 12 we know RM = 24 for the same reason diagonals of a parallelogram bisect each other so if half the diagonal is 12 the whole diagonal is 24. Now that I've proven RM = 24 and GA = 24 $\overline{RM} \cong \overline{GA}$ therefore parallelogram GRAM is a rectangle since the diagonals are congruent.

Score 2: The student gave a complete and correct response.

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.



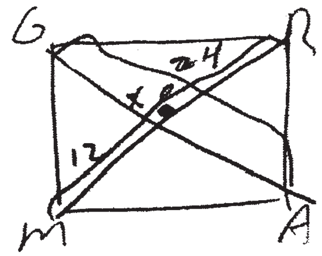
$\overline{RM} \cong \overline{GA}$, $24 = 24$ Parallelogram
GRAM is a rectangle
because diagonals are $\cong$

Score 2: The student gave a complete and correct response.

Question 31

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.



$$24 - 12 = \boxed{12}$$

$$12 + 12 = 24 \checkmark$$

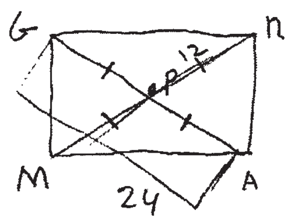
$$\therefore \overline{GA} \cong \overline{RM}$$

Score 1: The student wrote a partially correct explanation.

Question 31

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.



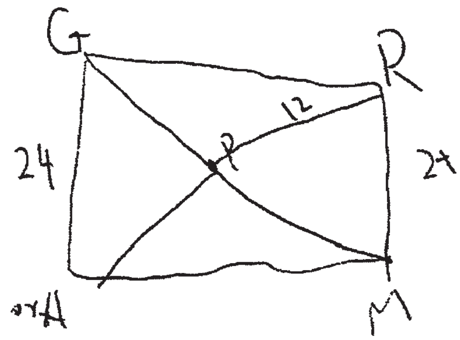
for parallelogram GRAM to be a rectangle the diagonals of the shape have to intersect at the midpoints which they do at point p. also bc all of the diagonals are ≅ this means the opposite sides are ≅ making GRAM a rectangle

Score 1: The student wrote a partially correct explanation.

Question 31

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.



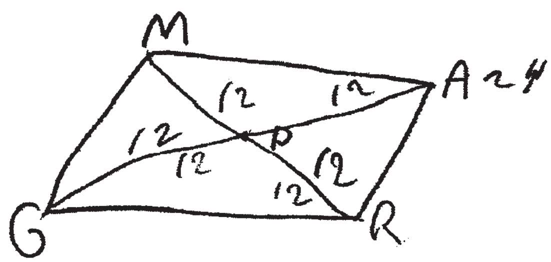
GRAM is A rectangle
because GA and RM will have the
same side length and they
all have intersect at P

Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 31

31 The diagonals of parallelogram *GRAM* intersect at *P*.

If $RP = 12$ and $GA = 24$, explain why *GRAM* is a rectangle.

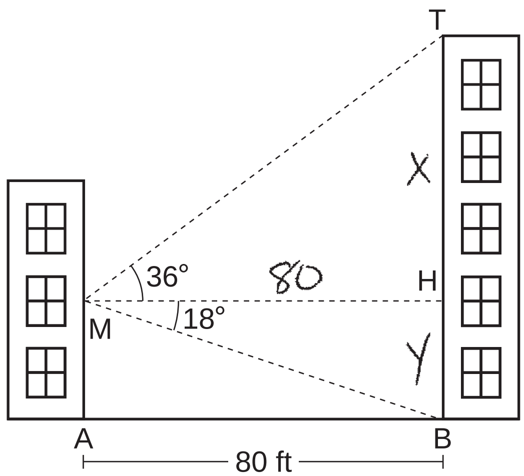


GRAM is a rectangle because it has equal sides like a square does, but it doesn't have 4 90° angles so instead of a square its a Rectangle

Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 32

32 As modeled below, Maria wants to determine the height of the building across the street from her position, *M*. The angle of elevation from *M* to the top of the building, *T*, is 36°. From *M*, the angle of depression to the base of the building, *B*, is 18°. The buildings are 80 feet apart.



Determine and state, to the *nearest foot*, the height of the building, *TB*, across the street from Maria.

$\tan 36 = \frac{x}{80}$

$x = 80(\tan 36)$

$x = 58.12340224$

$\tan 18 = \frac{y}{80}$

$y = 80(\tan 18)$

$y = 25.9935757$

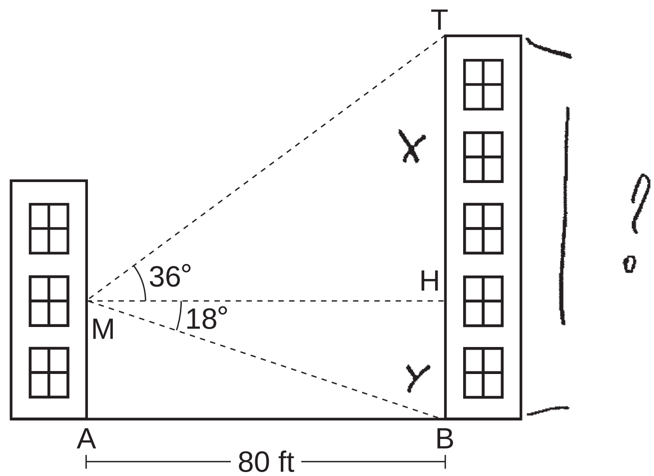
$x + y = 84.11697794$

84

Score 4: The student gave a complete and correct response.

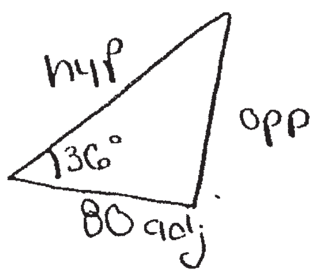
Question 32

32 As modeled below, Maria wants to determine the height of the building across the street from her position, M. The angle of elevation from M to the top of the building, T, is 36°. From M, the angle of depression to the base of the building, B, is 18°. The buildings are 80 feet apart.

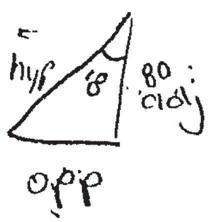


Determine and state, to the *nearest foot*, the height of the building, TB, across the street from Maria.

schcah toa



tan 36: $\frac{.7265}{1} = \frac{X}{80}$ → 58



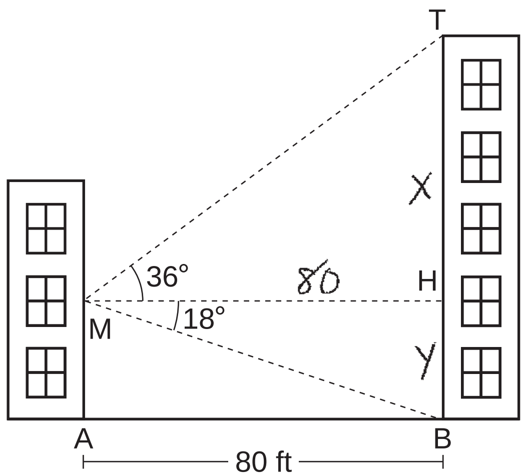
tan 18 : $\frac{.3249}{1} = \frac{Y}{80}$ → 26

$$\begin{array}{r} 58 \\ +\ 26 \\ \hline \end{array}$$

84 is the height of the building

Score 4: The student gave a complete and correct response.

32 As modeled below, Maria wants to determine the height of the building across the street from her position, M. The angle of elevation from M to the top of the building, T, is 36°. From M, the angle of depression to the base of the building, B, is 18°. The buildings are 80 feet apart.



Determine and state, to the *nearest foot*, the height of the building, TB, across the street from Maria.

$\tan 36 = \frac{X}{80}$

$X = (\tan 36)(80)$

$X = 58.1234022 4$

$\sin 18 = \frac{Y}{80}$

$Y = (\sin 18)(80)$

$Y = 24.72135955$

$X + Y = 82.84476179$

83

Score 3: The student made an error when determining the length of $\overline{HB}$, but found an appropriate length for $\overline{TB}$.

Question 32

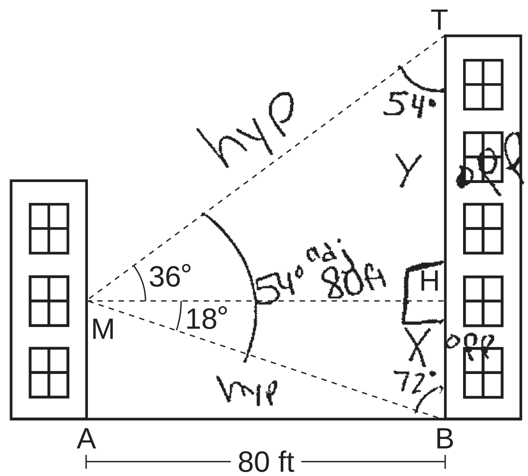
32 As modeled below, Maria wants to determine the height of the building across the street from her position, *M*. The angle of elevation from *M* to the top of the building, *T*, is 36°. From *M*, the angle of depression to the base of the building, *B*, is 18°. The buildings are 80 feet apart.

$\frac{C}{H}$ $\frac{A}{H}$ $\frac{O}{A}$

$90 + 8 = 108$

$180 - 108 = 72$

$36 + 18 = 54$



58.1

26.1

$36 + 90 = 126$

$180 - 126 = 54$

Determine and state, to the *nearest foot*, the height of the building, *TB*, across the street from Maria.

$\frac{\tan 18°}{1} = \frac{X}{80}$ $\frac{\tan 36°}{1} = \frac{Y}{80}$

$X = 80\tan 18°$ $Y = 80\tan 36°$

$X = 26.1$ $Y = 58.1$

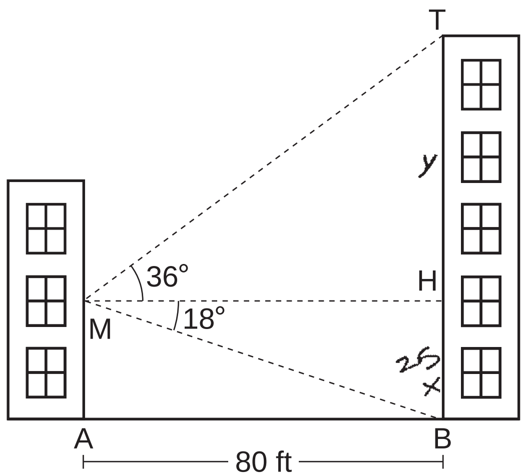
$58.1 + 26.1 = 84.2$

$\boxed{\text{height of building } TB = 84 \text{ ft}}$

Score 3: The student made a computational error when determining the length of $\overline{HB}$.

Question 32

32 As modeled below, Maria wants to determine the height of the building across the street from her position, M. The angle of elevation from M to the top of the building, T, is 36°. From M, the angle of depression to the base of the building, B, is 18°. The buildings are 80 feet apart.



Determine and state, to the *nearest foot*, the height of the building, TB, across the street from Maria.

SOH CAH TOA

$\frac{\sin 18}{1} = \frac{x}{80}$

$80 \sin 18 = x$

$\boxed{x \approx 25}$

Bulding $\overline{TB}$ is aprox 8.4 ft

$\frac{\tan 36}{1} = \frac{y}{80}$

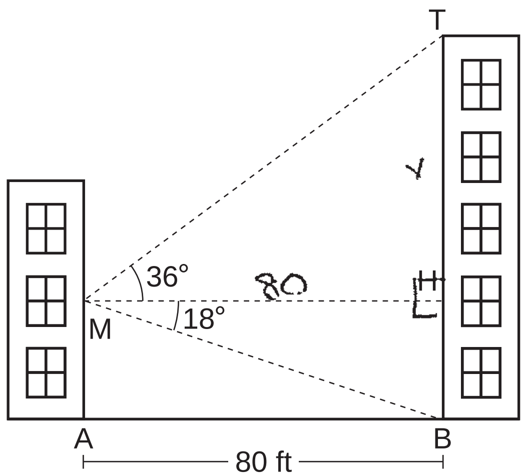
$80 \tan 36 = y$

$y \approx 58$ ft

Score 2: The student made errors when determining the lengths of $\overline{HB}$ and $\overline{TB}$.

Question 32

32 As modeled below, Maria wants to determine the height of the building across the street from her position, *M*. The angle of elevation from *M* to the top of the building, *T*, is 36°. From *M*, the angle of depression to the base of the building, *B*, is 18°. The buildings are 80 feet apart.



Determine and state, to the *nearest foot*, the height of the building, *TB*, across the street from Maria.

$\tan(36) = \frac{x}{80}$

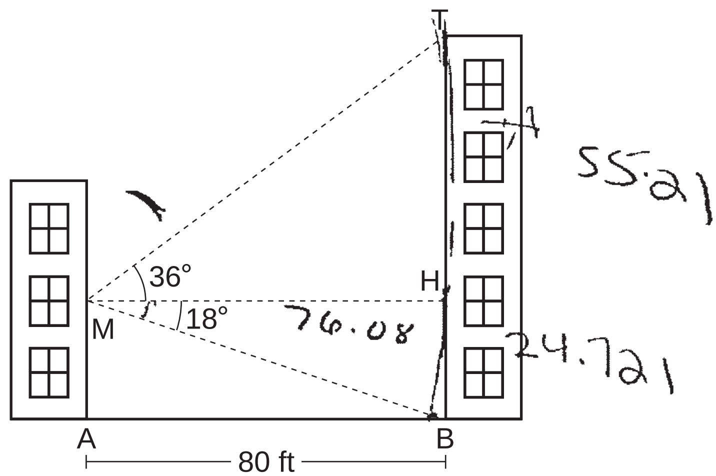
$\tan(36) \cdot 80 = x$

$58.123 = x$

Score 2: The student correctly determined the length of $\overline{TH}$.

Question 32

32 As modeled below, Maria wants to determine the height of the building across the street from her position, M. The angle of elevation from M to the top of the building, T, is 36°. From M, the angle of depression to the base of the building, B, is 18°. The buildings are 80 feet apart.



Determine and state, to the *nearest foot*, the height of the building, TB, across the street from Maria.

$$\frac{\sin(18)}{1} = \frac{HB}{80} \qquad \frac{\cos(18)}{1} = \frac{MH}{80}$$

$$HB = \sin(18)(80) \qquad MH = \cos(18)(80)$$

$$HB = 24.721 \qquad MH = 76.08$$

$$\frac{\tan(36)}{1} = \frac{TH}{76}$$

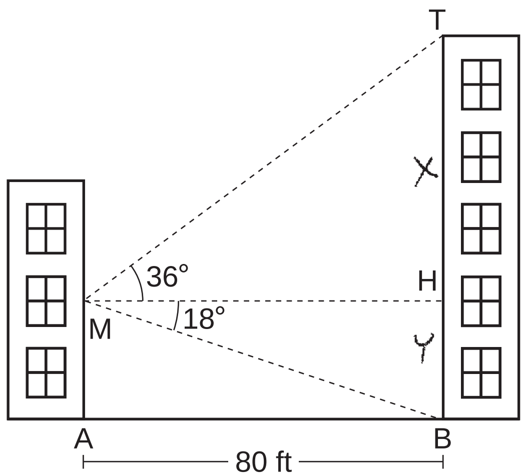
$$TH = \tan(36)(76)$$

$$TB = 79.938$$

Score 1: The student made errors when determining the lengths of $\overline{HB}$ and $\overline{MH}$ and made a rounding error when determining the length of $\overline{TB}$.

Question 32

32 As modeled below, Maria wants to determine the height of the building across the street from her position, *M*. The angle of elevation from *M* to the top of the building, *T*, is 36°. From *M*, the angle of depression to the base of the building, *B*, is 18°. The buildings are 80 feet apart.



Determine and state, to the *nearest foot*, the height of the building, *TB*, across the street from Maria.

$\tan 36° = \frac{x}{80}$ | $\sin 18° = \frac{y}{80}$

$X = .36 \times 80$ | $Y = .18 \times 80$

$x = 28.8$ | $Y = 14.4$

$X + Y =$ ~~[illegible]~~

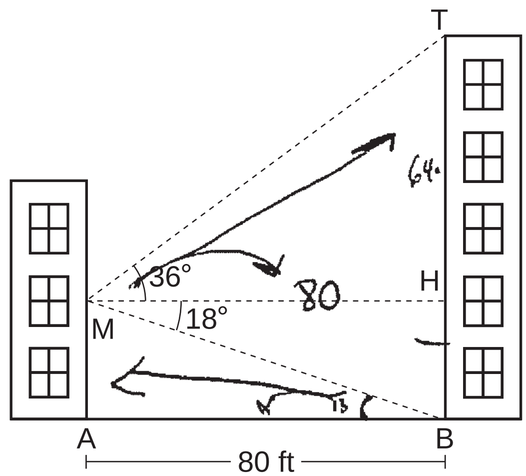
$$\begin{array}{r} 28.8 \\ + \ 14.4 \\ \hline 43.2 \end{array}$$

Score 1: The student wrote one correct relevant trigonometric equation.

32 As modeled below, Maria wants to determine the height of the building across the street from her position, M. The angle of elevation from M to the top of the building, T, is 36°. From M, the angle of depression to the base of the building, B, is 18°. The buildings are 80 feet apart.

SOH - CAH TOA

OH



$\cos 36 = x/80$

76.0345

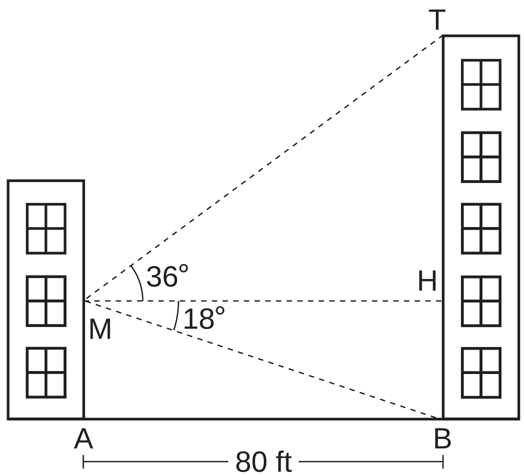
Determine and state, to the *nearest foot*, the height of the building, TB, across the street from Maria.

58.1234042 . . .

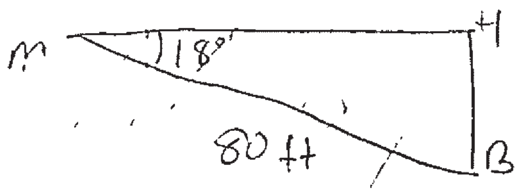
Score 0: The student did not show enough correct relevant course-level work to receive any credit.

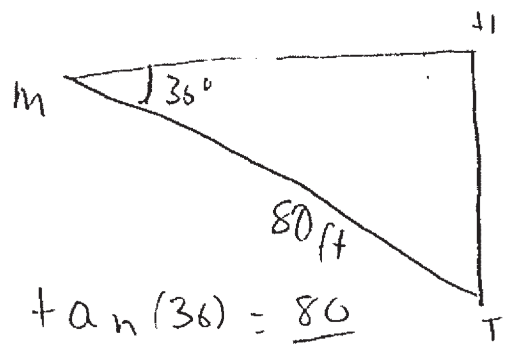
Question 32

32 As modeled below, Maria wants to determine the height of the building across the street from her position, *M*. The angle of elevation from *M* to the top of the building, *T*, is 36°. From *M*, the angle of depression to the base of the building, *B*, is 18°. The buildings are 80 feet apart.



Determine and state, to the *nearest foot*, the height of the building, *TB*, across the street from Maria.





$\tan(18) = \frac{80}{X}$

$80 \tan(18) = X$

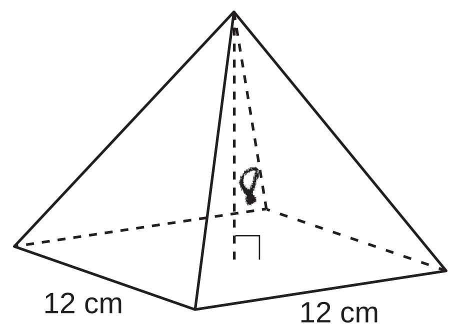
$\tan(36) = \frac{80}{Y}$

$80 \tan(36) = Y$

Score 0: The student did not show enough correct relevant course-level work to receive any credit.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$12 \cdot 12 = 144$ $m = d \cdot V$

$\frac{1}{3} \cdot 144 \cdot 8 = 384$

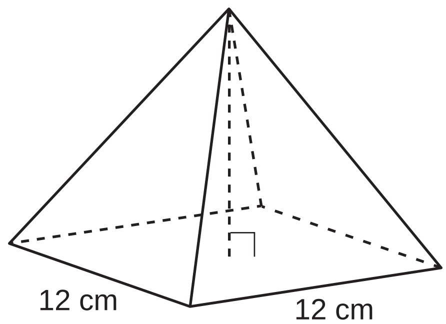
$384 \cdot 1.25 = 480g$ $0.48\ Kg$

$\frac{15}{0.48} = 31.25 \approx \boxed{31 \text{ Pyramids}}$

Score 4: The student gave a complete and correct response.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$\frac{1}{3}12^2(8) = 384$

$\frac{1.25}{1} = \frac{m}{384\text{cm}^3}$

$m = 480$ grams

$\frac{15}{.48} = 31.25$

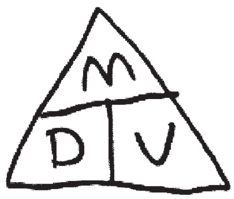
$\frac{480g}{1000} = .48$ kilograms

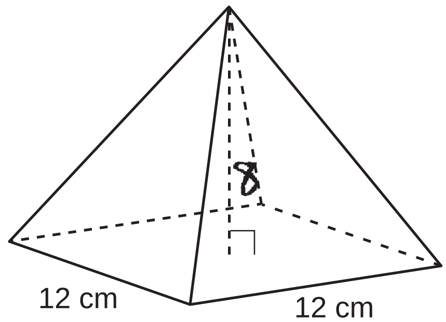
31 pyramids

Score 4: The student gave a complete and correct response.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.





The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(12 \cdot 12)(8)$

$V = \frac{1}{3}(144)(8)$

$V = \frac{1}{3}(1152)$

$V = 384$

15000g

$D \cdot V$

$(1.25)(384)$

480

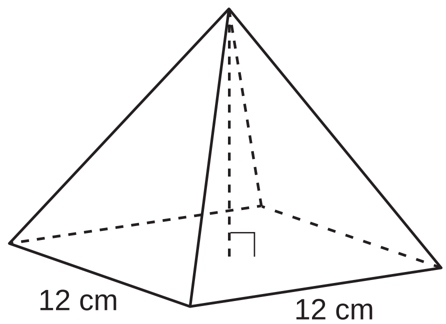
$\frac{15000}{480} = 31.25$

max 31 pyramids can be made

Score 4: The student gave a complete and correct response.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$15 \text{ Kg} = 15{,}000 \text{ g}$

$D = \frac{M}{V}$

$1.25 = \frac{15{,}000}{x}$

$\frac{1.25x}{1.25} = \frac{15{,}000}{1.25}$

$x = 12{,}000 \text{ cm}^3$

$V = \frac{1}{3} B \cdot h$

$= \frac{1}{3}(12 \cdot 12)(8)$

$= \frac{1}{3}(1152)$

$V = 384 \text{ cm}^3$

$\frac{12{,}000}{384}$

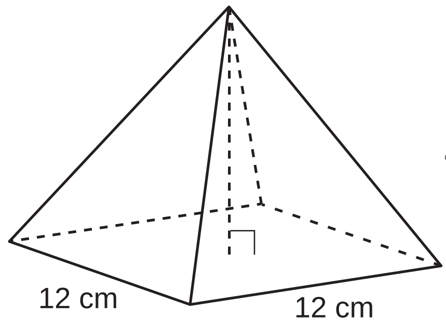
$= 31.25$

$\boxed{31}$

Score 4: The student gave a complete and correct response.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



$V = \frac{1}{3}Bh$

The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$\frac{1}{3}(12 \times 8) = 32$

$32 \times 1.25 = 40g$

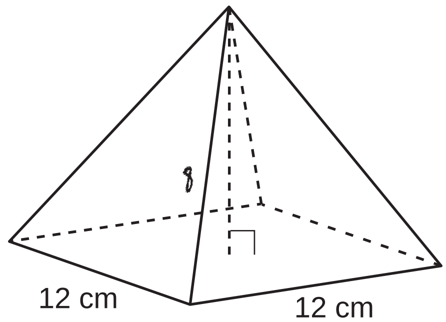
$\frac{15000}{40} = 375$

375 pyramids could be made

Score 3: The student made an error when determining the volume of one pyramid.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

V of Pyramid $= (8 \cdot 12 \cdot 12)\frac{1}{3}$

$V = 384\text{cm}^3$

$1.25 \times 384 = g$

$480 = g$

$480/100 = kg$

$4.8 = kg$

$15/4.8 =$ max # of pyra

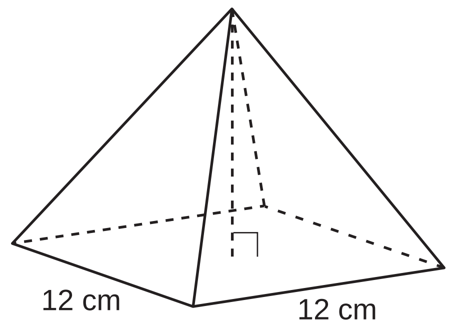
3.125

$\boxed{3 \text{ pyramids}}$

Score 3: The student made an error converting grams to kilograms.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$V=\frac{1}{3}Bh$

$V=\frac{1}{3}(12\cdot12)(8)$

$V=\frac{1}{3}(144)(8)$

$V=384\text{cm}^3$

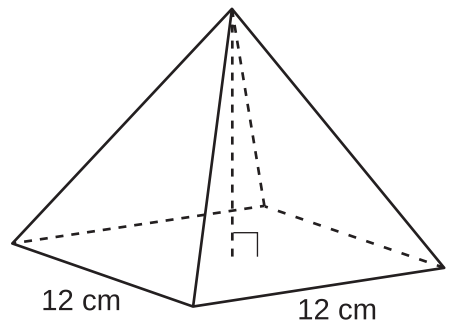
$M=384(1.25)$

$M=480$

Score 2: The student correctly determined the mass of one pyramid.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

pyramid

$v = \frac{1}{3}Bh$

$v = \frac{1}{3}(12 \cdot 12)8$

$v = 384 \text{ cm}^3$

$384 \cdot 1.25 = 480$

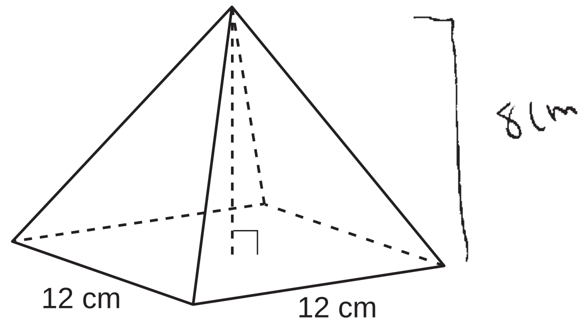
$480/15 = 32$

32 pyramids

Score 2: The student correctly determined the mass of one pyramid.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

of base
$A = 12 \cdot 12 = 144$

$V = \frac{1}{3}(144)(8)$

$V = 384$

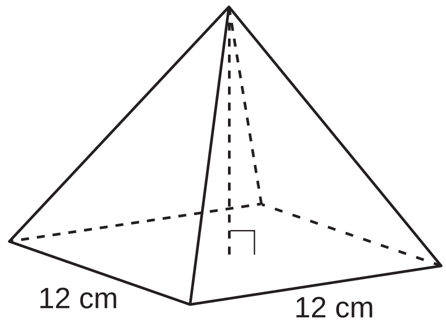
$\frac{384}{15} = 25.6$

artist
can make
25 pyramids

Score 1: The student correctly determined the volume of one pyramid.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



$h = 8$

The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$A_{base} = 12(12)$

$= 144$

$V = \frac{1}{3}(144)(8)$

$V = 384$

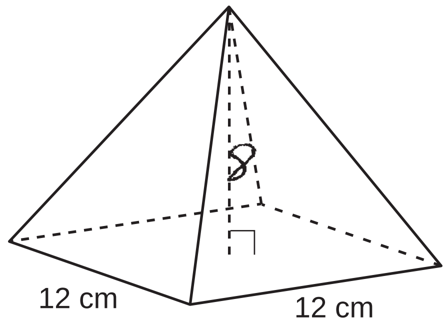
$384/1.25$

$= 307.2$

Score 1: The student correctly determined the volume of one pyramid.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$\frac{1}{3}Bh$

$d = \frac{m}{V}$ $\quad 1.25 = \frac{m}{256}$ $\quad \frac{1}{3}(12)(12)(8)$

256

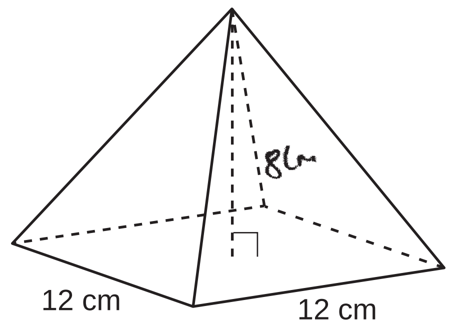
$320 = m$

$320/15 = 21.3333333$

21 pyramids

Score 1: The student made a computational error when determining the volume of one pyramid, but found an appropriate mass.

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$12 \times 12 = 144$

$12 \times 8 = 96$

$\times 4$

384

$384 + 144 = 528$

44

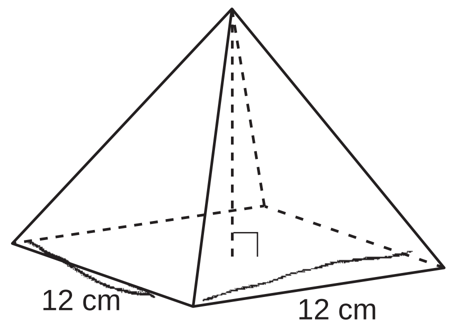
$44 = \frac{660}{15} = \frac{15}{15}$

$\frac{15}{528} = \frac{1.25}{1}$

Score 0: The student did not show enough correct relevant work to receive any credit.

Question 33

33 An artist uses clay to make solid pyramids with a square base whose sides measure 12 cm, as modeled below.



The height of each pyramid is 8 cm, and the density of the clay is 1.25 g/cm^3. If the artist has 15 kilograms of clay, determine and state the maximum number of pyramids that can be made.

$12 \cdot 12 \cdot 8 = 1152$

$1152 / 1.25 \text{ g/cm}^3$

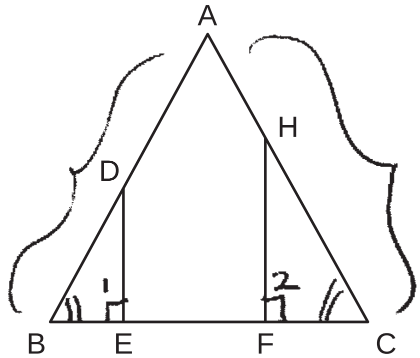
$= 921.6^3 / 15$

$= 61.44$

≈ 61 pyramids.

Score 0: The student did not show enough correct relevant work to receive any credit.

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

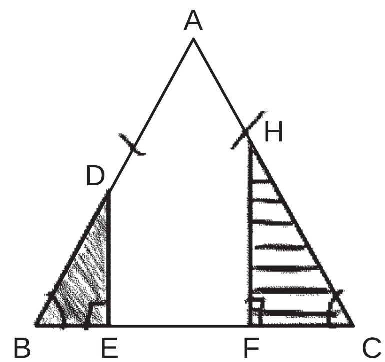
$\triangle ABC$

Statements	Reasons
1 $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, $\overline{HF} \perp \overline{BC}$	1 Given
2 $\triangle ABC$ is isos.	2 2 $\cong$ legs $\rightarrow$ isos. $\triangle$
3 $\angle B \cong \angle C$	3 isos $\triangle \rightarrow$ 2 $\cong$ base $\angle$'s
4 $\angle 1, \angle 2$ are right	4 $\perp$ lines $\rightarrow$ right $\angle$'s
5 $\angle 1 \cong \angle 2$	5 Right $\angle$'s $\rightarrow \cong \angle$'s
6 $\triangle DBE \sim \triangle HCF$	6 AA $\sim$
7 $\dfrac{DE}{BE} = \dfrac{HF}{CF}$	7 $\sim \triangle$s $\rightarrow$ proportional corr. sides

Score 4: The student gave a complete and correct response.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



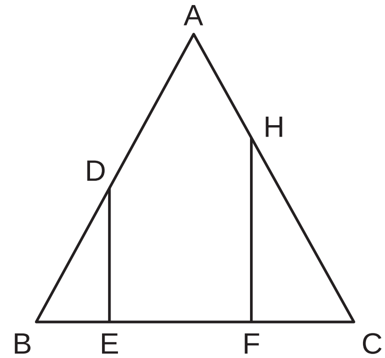
Prove: $\frac{DE}{BE} = \frac{HF}{CF}$

Statements	Reasons
① $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, $\overline{HF} \perp \overline{BC}$	① Given
② $\angle B \cong \angle C$	② In a $\triangle$, angles opposite $\cong$ sides are $\cong$
③ $\angle DEB \cong \angle HFC$	③ $\perp$ lines form $\cong$ right $\angle$s
④ $\triangle DEB \sim \triangle \cancel{HCF}$ HFC	④ AA$\sim$
⑤ $\frac{DE}{BE} = \frac{HF}{CF}$	⑤ Corresponding sides of $\sim$ $\triangle$s are in proportion

Score 4: The student gave a complete and correct response.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

$\triangle ABC$, $\overline{AB} \cong \overline{AC}$
Given

$\overline{DE} \perp \overline{BC}$
$\overline{HF} \perp \overline{BC}$
Given

$\triangle ABC$ is isosceles
If a $\triangle$ has 2 $\cong$ sides it is isosceles

$\angle DEB \cong \angle HFC$
$\perp$ lines form $\cong$ right $\angle$'s

$\angle B \cong \angle C$
Isosceles $\triangle$'s have 2 $\cong$ base $\angle$'s

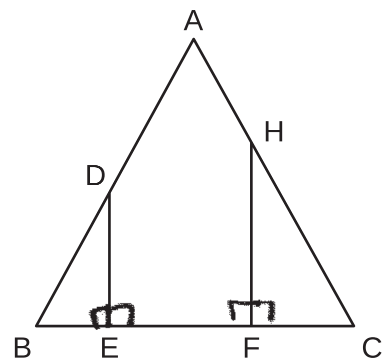
$\triangle DEB \sim \triangle HFC$
AA~

$\dfrac{DE}{BE} = \dfrac{HF}{CF}$
Similar $\triangle$'s corresponding sides are in proportion

Score 4: The student gave a complete and correct response.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



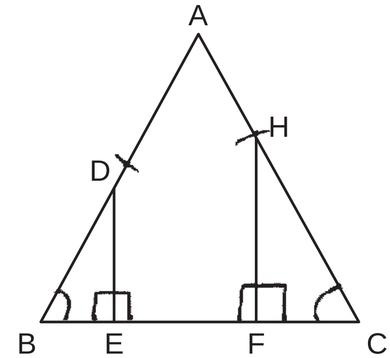
Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

Statement	Reason
1. $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, $\overline{HF} \perp \overline{BC}$	1. Given
2. $\angle DEB$ and $\angle HFC$ are right $\angle$'s	2. $\perp$ segments form right $\angle$'s
3. $\angle DEB \cong \angle HFC$	3. All right $\angle$'s are $\cong$
4. $\triangle ABC$ is isoscelec	4. A $\triangle$ with 2 $\cong$ sides is isosceles
5. $\angle B \cong \angle C$	5. Base $\angle$'s of a $\cong$ $\triangle$ are $\cong$
6. $\triangle DBE \sim \triangle HCF$	6. $AA \cong AA$
7. $\frac{DE}{BE} = \frac{HF}{CF}$	7. Corr. sides of similar $\triangle$'s are in proportion

Score 3: The student wrote an incorrect reason in step 5.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

product of mean equals product of extremes

corraspending parts of corrsponding triangles are congruen

(1) $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, $\overline{HF} \perp \overline{BC}$, $\triangle ABC$ — (1) Given

(2) $\angle ABC \cong \angle ACB$ — (2) if 2 sides of a triangle are $\cong$ then the $\angle$'s opposite those sides are $\cong$

(3) $\angle DEB$ and $\angle HFC$ are right angles — (3) $\perp$ lines form right angles

(4) $\angle DEB \cong \angle HFC$ — (3) All right angles are congruent

(5) $\triangle DBE \sim \triangle HCF$ — (5) AA~

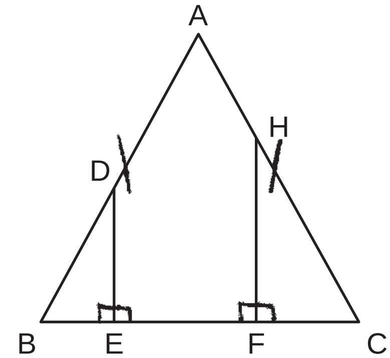
(6) $\overline{DE} \cong \overline{CF}$ $\overline{HF} \cong \overline{BE}$ — (6) coraspending parts of coraspending triangles are congruent

(7) $\dfrac{DE}{BE} = \dfrac{HE}{CF}$ — (7) Products of means is equal to the product of the extrems

Score 3: The student correctly proved $\triangle DBE \sim \triangle HCF$.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



$DE \cdot CF = BE \cdot HF$

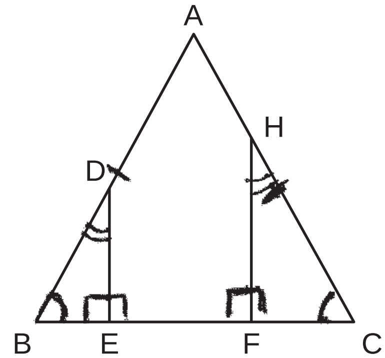
Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

Statment	reasn
1 $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, $\overline{HF} \perp \overline{BC}$, ABC is a triangle	1 given
2 $\angle ABE \cong \angle ACF$	2 all base ∠'s of a isosceles △ are ≅
3 $\angle DEB$, $\angle HFC$ are right ∠'s	3 perpendicular lines form right ∠'s
4 $\angle DEB \cong \angle HFC$	4 all right ∠'s are ≅
5 $\triangle BDE \sim \triangle CHF$	5 AA~
6 $\dfrac{DE}{BE} = \dfrac{HF}{CF}$	6 product of the means equals the product of the extremes

Score 2: The student was missing a statement and reason to prove step 2. The student wrote an incorrect reason in step 6.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



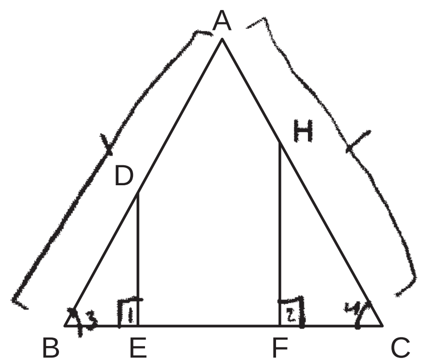
Prove: $\frac{DE}{BE} = \frac{HF}{CF}$

1. $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, $\overline{HF} \perp \overline{BC}$	1. Given
2. $\angle ABE \cong \angle ACF$	2. Definition of icosceles
3. $\angle DEB$ and $\angle HFC$ are $\cong$ right $\angle$'s	3. Perpendicular lines form $\cong$ right angles
4. $\triangle DBE \sim \triangle HCF$	4. AA~
5. $\frac{DE}{BE} = \frac{HF}{CF}$	5. Due to similarity since the angles are the same they are similar which prove it

Score 2: The student wrote correct relevant statements and reasons in steps 3 and 4.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



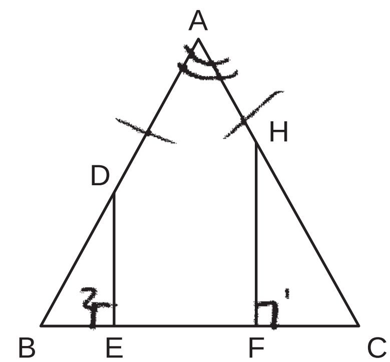
Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

S	R
1. $\triangle ABC$ $\overline{AB} \cong \overline{AC}$ $\overline{DE} \perp \overline{BC}$ $\overline{HF} \perp \overline{BC}$	1. Given
2. $\measuredangle 1 \cong \measuredangle 2$	2. $\perp$ lines form $\cong$ rt $\measuredangle$'s
3. $\measuredangle 3 \cong \measuredangle 4$	3. Congruent sides form $\cong$ opposite $\measuredangle$'s
4. $\triangle DEB \sim \triangle HFC$	4. AA~
5. $\dfrac{DE}{BC} = \dfrac{HF}{CF}$	5. CPSTS

Score 2: The student wrote an incomplete reason in step 3 and an incorrect reason in step 5.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



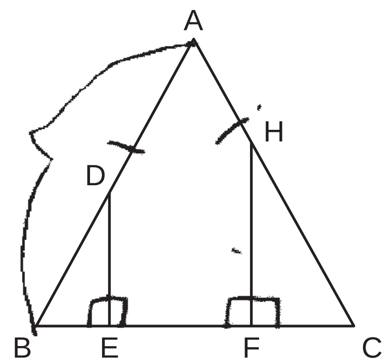
Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

Statments	Reason
① $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, $\overline{HF} \perp \overline{BC}$	① Given
② ∠1 and ∠2 are right ∠'s	② All ⊥ lines form right ∠'s
③ ∠2 ≅ ∠1	③ All right ∠'s are ≅
④ ∠A ≅ ∠A	④ Reflexive property
⑤ ΔDBE ~ ΔHCF	⑤ AA~
⑥ $\frac{DE}{BE} = \frac{HF}{CF}$	⑥ 2 Δ's similar, ≅ ∠'s are crossed multiplied

Score 1: The student correctly proved ∠2 ≅ ∠1.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$

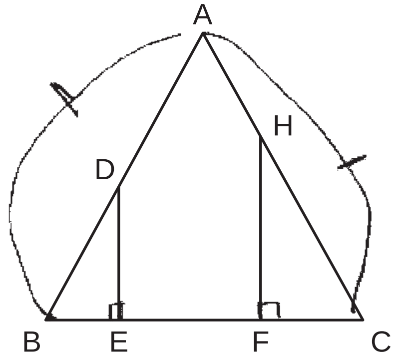


Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

we are given $\overline{AB} \cong \overline{AC}$ $\overline{DE} \perp \overline{BC}$ and $\overline{HF} \perp \overline{BC}$.
$\triangle ABC$ is isocoles b/c it has
2 congruent sides $\overline{AB}$, $\overline{AC}$, so $\angle B \cong \angle C$.

Score 1: The student wrote one correct relevant statement and reason.

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



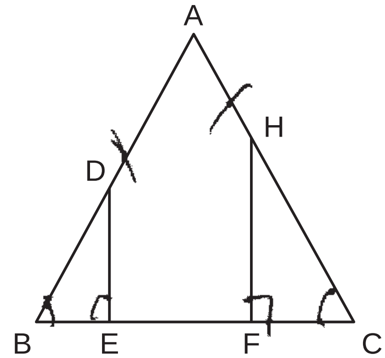
Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

I know	b/c
1. $\overline{AB} \cong \overline{AC}$	1. given
2. $\overline{DE} \perp \overline{BC}$	2. given
3. $\angle DEB$ is a rt $\angle$	3. $\perp$ lines form rt $\angle$
4. $\overline{HF} \perp \overline{BC}$	4. given
5. $\angle HFC$ is a rt $\angle$	5. $\perp$ lines form rt $\angle$
6. $\angle DEB \cong \angle HFC$	6. All rt $\angle$s are $\cong$
7. $\triangle DEB \sim \triangle HFC$	7 AA
8.	

Score 1: The student correctly proved $\angle DEB \cong \angle HFC$.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



Prove: $\frac{DE}{BE} = \frac{HF}{CF}$

1.) $\angle B \cong \angle C$

2.) $\angle E \cong \angle F$

AA

3.) $\frac{DE}{BE} = \frac{HF}{CF}$

1) base $\angle$s are $\cong$

2.) $\perp$ $\angle$s are $\cong$

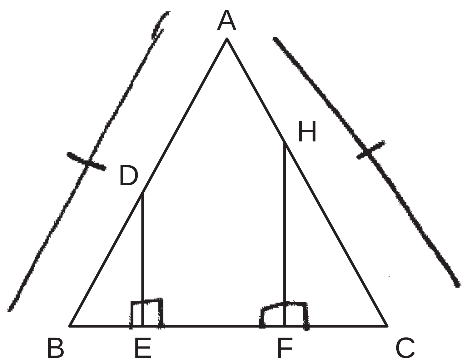
2.)

3.) AA

Score 0: The student did not show enough correct work to receive any credit.

Question 34

34 Given: Triangle ABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$, and $\overline{HF} \perp \overline{BC}$



Prove: $\dfrac{DE}{BE} = \dfrac{HF}{CF}$

Statement	Reasons
1. ΔABC, $\overline{AB} \cong \overline{AC}$, $\overline{DE} \perp \overline{BC}$ and $\overline{HF} \perp \overline{BC}$	1. Given
2.	
) $\Delta DEB \sim \Delta HFC$	) AA similarity
) $\dfrac{DE}{BE} = \dfrac{HF}{CF}$	) Prod of means = prod of extremes.

Score 0: The student did not show enough correct work to receive any credit.

Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$D(1,5)$

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$m_{\overline{AB}} = -\frac{3}{2}$ $m_{\overline{BC}} = \frac{6}{4}$

$m_{\overline{CD}} = \frac{-3}{2}$ $m_{\overline{AD}} = \frac{6}{4}$

same slope $\overline{AB} \parallel \overline{CD}$

same slope $\overline{BC} \parallel \overline{AD}$

$\therefore$ ABCD is a parallelogram because both sets of opposite sides are parallel

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$E(-3,5)$

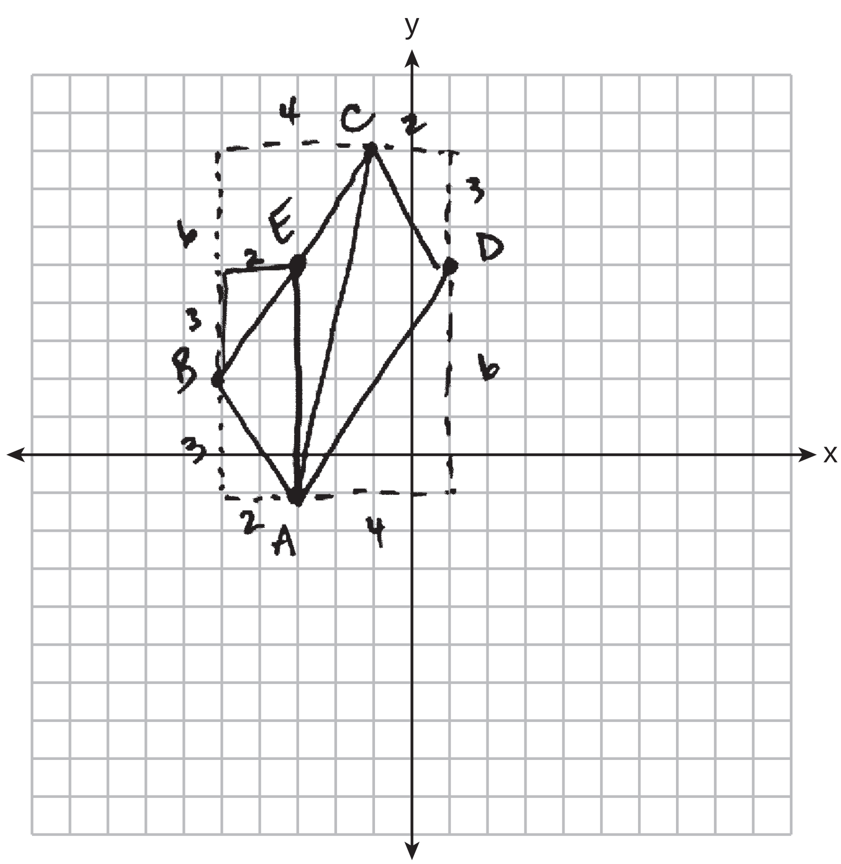
Question 35 is continued on the next page.

Score 6: The student gave a complete and correct response.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$$\left.\begin{array}{l} d_{BE} = \sqrt{3^2 + 2^2} = \sqrt{13} \\ d_{AB} = \sqrt{(-3)^2 + (2)^2} = \sqrt{13} \end{array}\right\} \overline{BE} \cong \overline{AB}$$

$\therefore \triangle ABE$ is an isosceles triangle because 2 sides are congruent.



Question 35

35 Triangle *ABC* has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point *D* such that quadrilateral *ABCD* is a parallelogram.
[The use of the set of axes on the next page is optional.]

$D(1,5)$

Prove *ABCD* is a parallelogram.
[The use of the set of axes on the next page is optional.]

$$d = \sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$$

$$d_{AB} = \sqrt{(-3+5)^2+(-1-2)^2} = \sqrt{4+9} = \sqrt{13}$$
$$d_{CD} = \sqrt{(1+1)^2+(5-8)^2} = \sqrt{4+9} = \sqrt{13}$$
$$d_{BC} = \sqrt{(-5+1)^2+(2-8)^2} = \sqrt{16+36} = \sqrt{52}$$
$$d_{AD} = \sqrt{(1+3)^2+(5+1)^2} = \sqrt{16+36} = \sqrt{52}$$

ABCD is a p-gram b/c both pairs of opposite sides are congruent.

State the coordinates of point *E*, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$E(-3,5)$

Question 35 is continued on the next page.

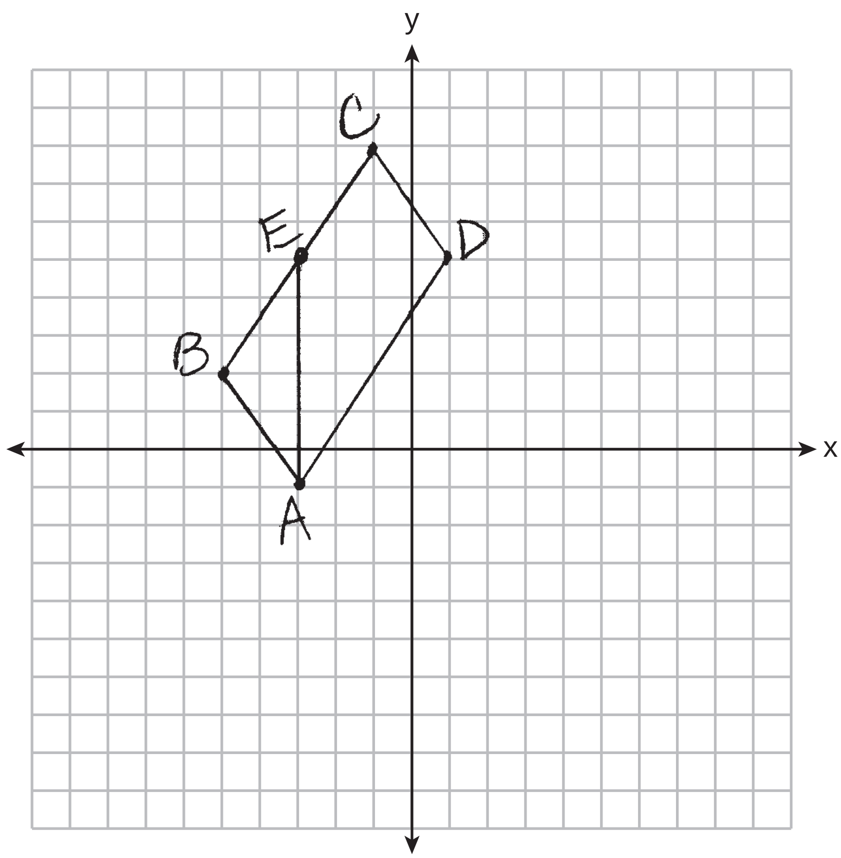
Score 6: The student gave a complete and correct response.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$AB = \sqrt{13}$

$$d_{BE} = \sqrt{(-5++3)^2 + (2-5)^2}$$
$$= \sqrt{4+9}$$
$$= \sqrt{13}$$

$\triangle ABE$ is isosceles because it has 2 $\cong$ sides.
($\overline{AB} \cong \overline{BE}$).



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$D \quad \overset{3}{\downarrow}, \overset{2}{\rightarrow} \qquad D(1,5)$

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$$\text{Midpoint } \overline{AC} = \left(\frac{-3+(-1)}{2}, \frac{-1+8}{2}\right) = \left(\frac{-4}{2}, \frac{7}{2}\right) = (-2, 3.5)$$

$$\text{Midpoint } \overline{BD} = \left(\frac{-5+1}{2}, \frac{2+5}{2}\right) = \left(\frac{-4}{2}, \frac{7}{2}\right) = (-2, 3.5)$$

Since diagonals $\overline{AC}$ and $\overline{BD}$ have the same midpoint, they bisect eachother.
Since the diagonals bisect eachother, ABCD is a parallelogram.

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$$\text{Midpoint of } \overline{BC} = \left(\frac{-5+(-1)}{2}, \frac{2+8}{2}\right) = \left(\frac{-6}{2}, \frac{10}{2}\right)$$

$E(-3, 5)$

Question 35 is continued on the next page.

Score 6: The student gave a complete and correct response.

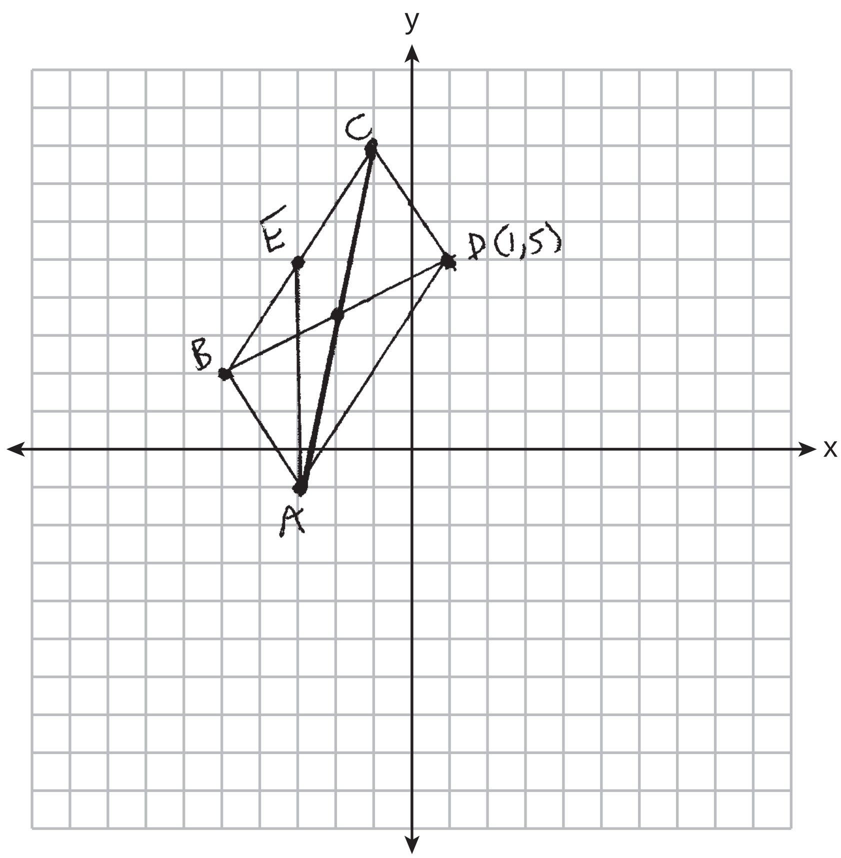
Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$AB = \sqrt{(-5-(-3))^2+(2-(-1))^2}$
$= \sqrt{(-2)^2+3^2}$
$= \sqrt{4+9}$
$AB = \sqrt{13}$

$BE = \sqrt{(-3-(-5))^2+(5-2)^2}$
$= \sqrt{2^2+3^2}$
$= \sqrt{4+9}$
$BE = \sqrt{13}$

$\overline{AB} \cong \overline{BE}$

Since 2 sides of $\triangle ABE$ are $\cong$, it is isosceles.



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

D(1,5)

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

OPP Sides parallel

$m\overline{BA} = \frac{-1-2}{-3+5} = \frac{-3}{2}$ \ $\overline{BA} \parallel \overline{CD}$

$m\overline{CD} = \frac{5-8}{1+1} = \frac{-3}{2}$

$m\overline{CB} = \frac{2-8}{-5+1} = \frac{-6}{-4} = \frac{3}{2}$ \ $\overline{CB} \parallel \overline{DA}$

$m\overline{DA} = \frac{-1+-5}{-3-1} = \frac{-6}{-4} = \frac{3}{2}$

Since both pairs of OPP Sides ∥, ABCD is a parallelogram

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$\frac{-5+-1}{2} = -3$

$\frac{8+2}{2} = 5$

(−3,5)

Question 35 is continued on the next page.

Score 6: The student gave a complete and correct response.

Question 35 continued.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

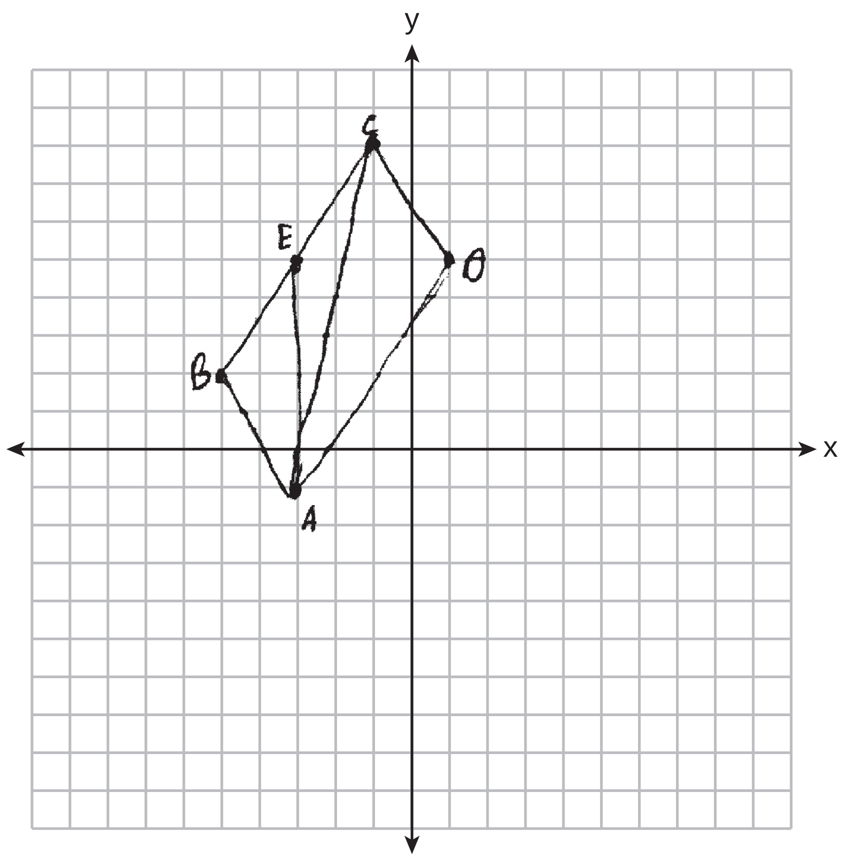
$A(-3,-1)\quad B(-5,2)\quad E(-3,5)$

$$d_{\overline{AB}} = \sqrt{(2+1)^2+(-5+3)^2}$$
$$\sqrt{9+4}$$
$$\sqrt{13}$$

$$d_{\overline{BE}} = \sqrt{(5-2)^2+(-3+5)^2}$$
$$\sqrt{9+4}$$
$$\sqrt{13}$$

$\overline{AB} \cong \overline{BE}$

Since 2 sides $\cong$, $\triangle ABE$ is an isosceles triangle



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

D: (1,5)

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

Slope: $\overline{AD}: \frac{3}{2}$ $\overline{BC}: \frac{3}{2}$ $\overline{CD}: \frac{-3}{2}$ $\overline{AB}: \frac{-3}{2}$

same so //

if 2 sets opposite parallel lines
then it is a parallelogram.

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$\boxed{(-3,5)}$

B
-5,2

C
-1,8

$$\left(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2}\right)$$

$$\left(\frac{-5+-1}{2}, \frac{2+8}{2}\right)$$

(-3, 5)

Question 35 is continued on the next page.

Score 5: The student did not show work when finding the slopes of $\overline{CD}$ and $\overline{DA}$.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

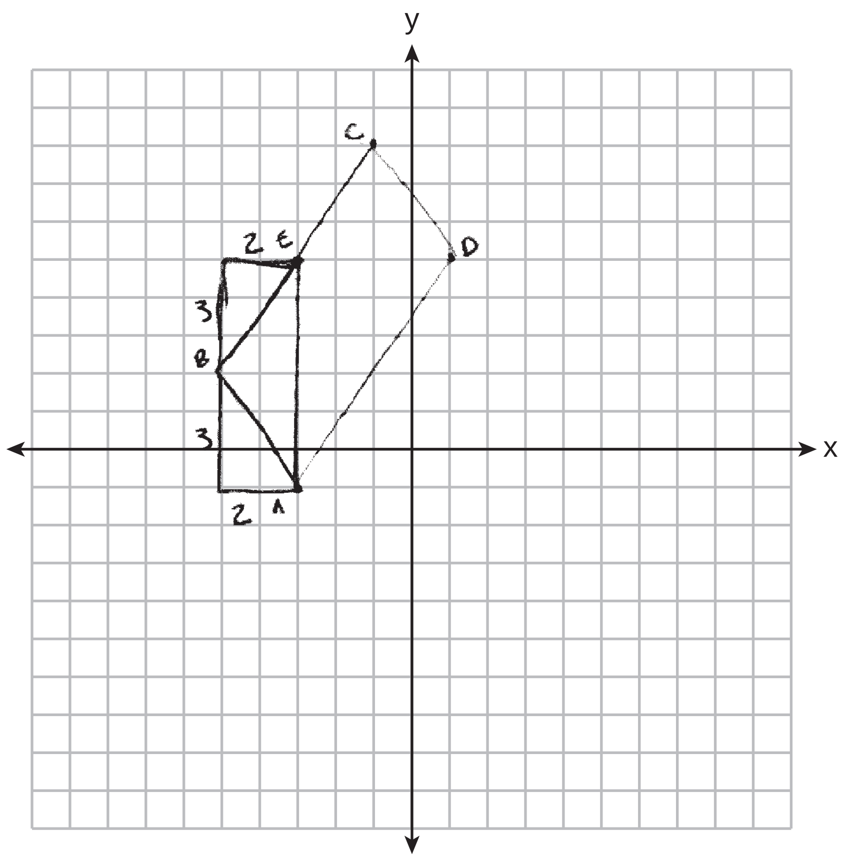
$2^2 + 3^2 = c^2$

$\sqrt{4+9} = C$

$\sqrt{13}$

distance : $\underbrace{AB : \sqrt{13} \quad BE : \sqrt{13}}_{\text{Same so } \cong}$

$\triangle ABE$ is an isosceles triangle because it has 2 congruent sides.



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

D(1,5)

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$D_{\overline{BC}} = \sqrt{4^2 + 6^2} = \sqrt{16+36} = \sqrt{52}$

$D_{\overline{CD}} = \sqrt{(-3)^2 + 2^2} = \sqrt{9+4} = \sqrt{13}$

$D_{\overline{DA}} = \sqrt{(-4)^2 + 6^2} = \sqrt{16+36} = \sqrt{52}$

$D_{\overline{AB}} = \sqrt{(2)^2 + (-3)^2} = \sqrt{4+9} = \sqrt{13}$

distances are =
So sides are ≅

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$\left(\frac{-5-1}{2}, \frac{2+8}{2}\right)$

$(-3, 5)$

Question 35 is continued on the next page.

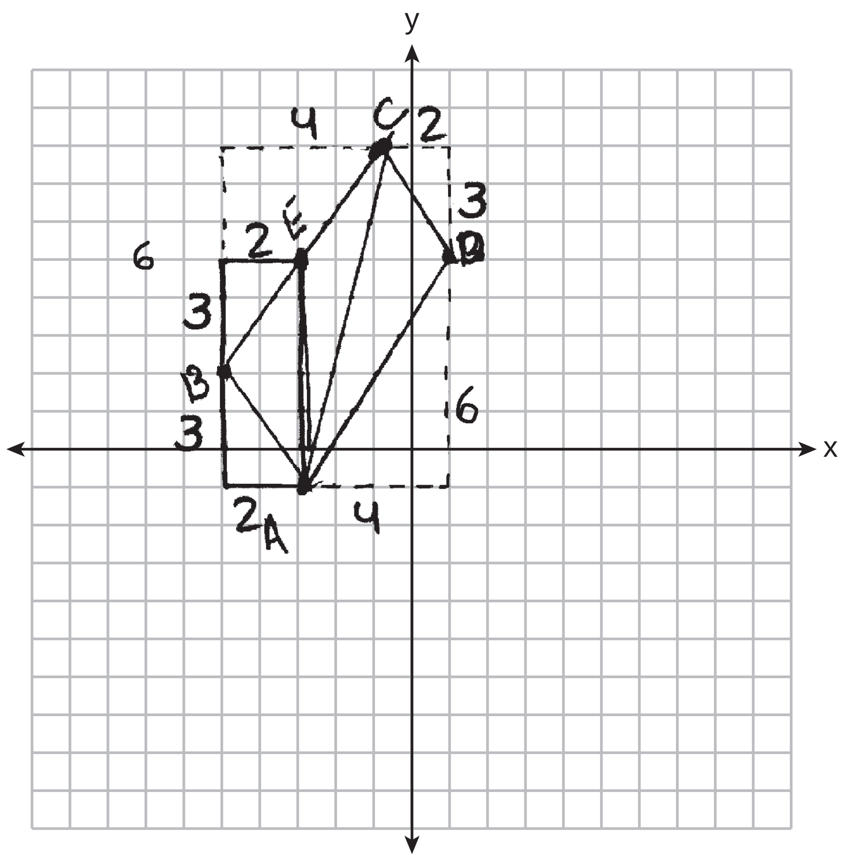
Score 5: The student wrote an incomplete conclusion when proving $ABCD$ is a parallelogram.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$D_{\overline{BE}} = \sqrt{3^2 + 2^2} = \sqrt{9+4} = \sqrt{13}$

$D_{\overline{BA}} = \sqrt{(-3)^2 + 2^2} = \sqrt{9+4} = \sqrt{13}$

Two sides are $\cong$ so the Δ is isosceles



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$m_{\overline{AB}} = \frac{2--1}{-5--3} = \frac{3}{-2}$

$D = (1, 5)$

$m_{\overline{CD}} = \frac{8-y}{-1-x} = \frac{3}{-2}$

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$m_{\overline{AB}} = \frac{3}{-2}$

$m_{\overline{CD}} = \frac{8-5}{-1-1} = \frac{3}{-2}$

same slope so $\overline{AB} \parallel \overline{CD}$

$d_{\overline{AB}} = 3.6055\ldots$

$\text{distance}_{\overline{CD}} = 3.6055\ldots$

same distance so $\overline{AB} \cong \overline{CD}$

One pair of opp sides are $\parallel$ + $\cong$ so it's a parallelogram

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$E(-3, 5)$

Question 35 is continued on the next page.

Score 5: The student did not show work when determining the lengths of $\overline{AB}$, $\overline{CD}$, and $\overline{EB}$.

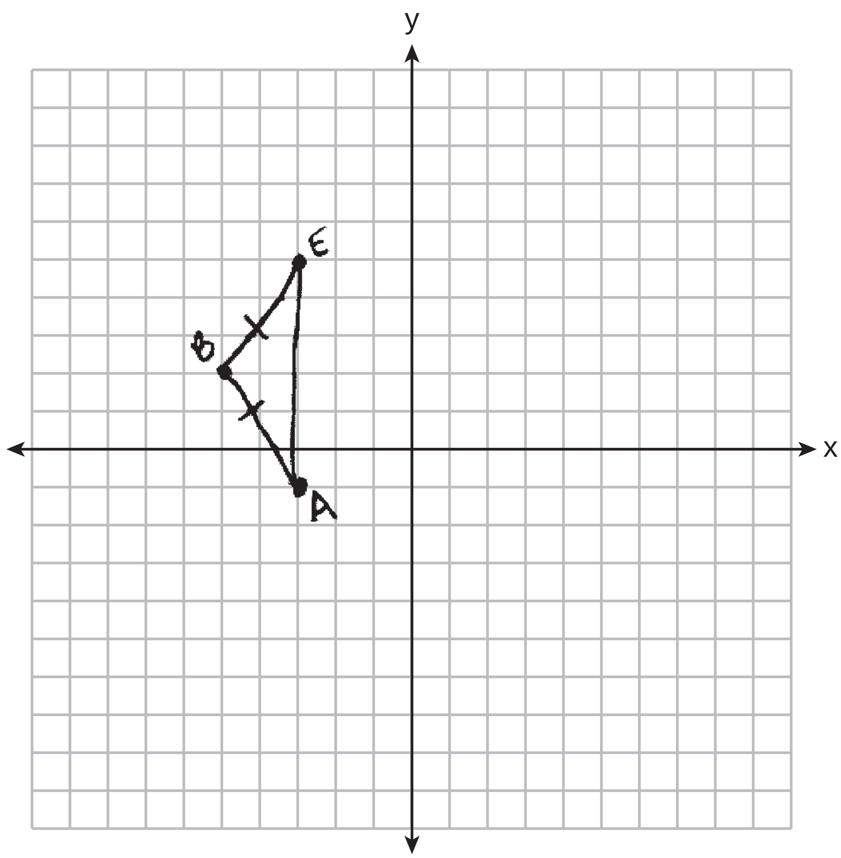
Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$d_{\overline{AB}} = 3.6055\ldots$

$d_{\overline{BE}} = 3.6055\ldots$

same distance
So $\overline{AB} \cong \overline{BE}$

$\triangle ABE$ is an isos triangle because 2 sides are $\cong$



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$m = \frac{\Delta y}{\Delta x}$ $\frac{6}{4} = \frac{3}{2}$

$D = (1,5)$

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$c = \sqrt{a^2+b^2}$

$AB = \sqrt{2^2+3^2} = \sqrt{13}$

$BC = \sqrt{4^2+6^2} = \sqrt{52}$

$CD = \sqrt{2^2+3^2} = \sqrt{13}$

$DA = \sqrt{4^2+6^2} = \sqrt{52}$

$\overline{AB} \cong \overline{CD}$

$\overline{BC} \cong \overline{DA}$

(2 pairs of OPP sides $\cong$)

$\therefore \square ABCD$

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$E = (-3,5)$

Question 35 is continued on the next page.

Score 4: The student showed no correct work when proving $\triangle ABE$ is isosceles.

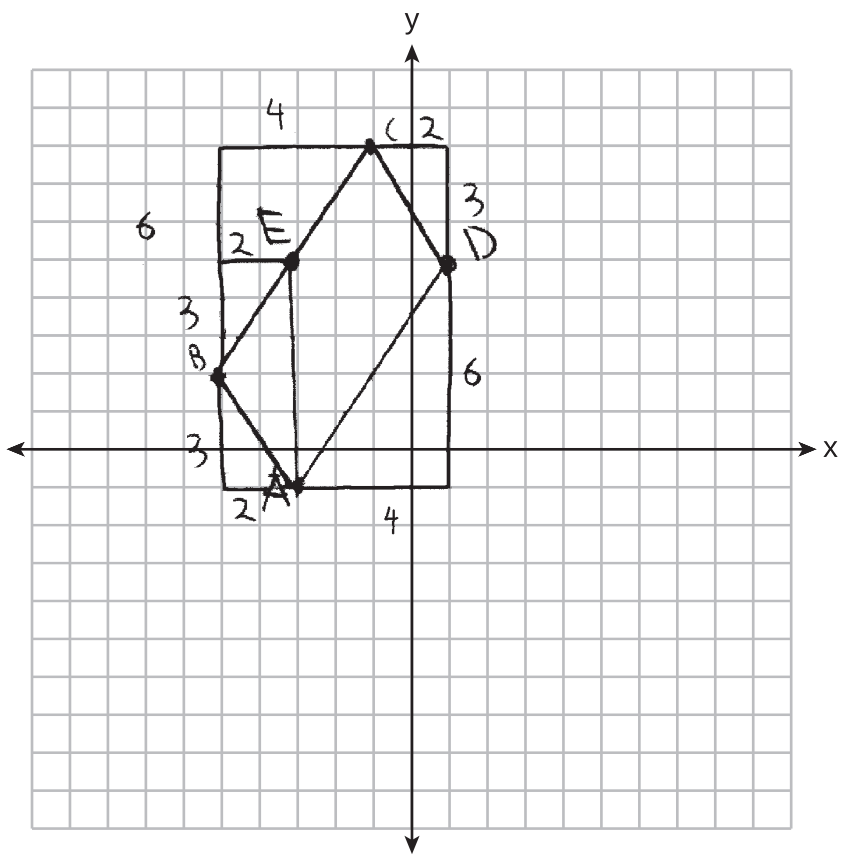
Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$M = \frac{\Delta y}{\Delta x}$

ΔABE is isoccles(A isosceles Δ has 2 $\cong$ sides)

$EB = \frac{3}{2}$

$AB = \frac{-3}{2}$



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.

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

Slope $\overline{AB}$: $\frac{2+1}{-5+3} = \frac{-3}{2}$ ↑ →

$D(1, 5)$

Prove $ABCD$ is a parallelogram.

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

Slope $\overline{BC}$: $\frac{2-8}{-5+1} = \frac{-6}{-4} = \frac{3}{2}$

Slope $\overline{AD}$: $\frac{-1-5}{-3-1} = \frac{-6}{-4} = \frac{3}{2}$

parallel line

Slope $\overline{BA}$: $\frac{-1-2}{-3+5} = \frac{-3}{2}$

Slope $\overline{CD}$: $\frac{5-8}{1+1} = \frac{-3}{2}$

parallel line

State the coordinates of point E, the midpoint of $\overline{BC}$.

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

Slope $\overline{BC}$: $\frac{8-2}{-1+5} = \frac{6}{4} = \frac{3}{2}$ ↑ →

$E(-3, 5)$

Question 35 is continued on the next page.

Score 4: The student wrote an incomplete conclusion when proving $ABCD$ is a parallelogram. The student wrote a partially correct concluding statement when proving $\triangle ABE$ is isosceles.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$D_{\overline{AE}}: \sqrt{(-3+3)^2+(-1-5)^2}$

$: \sqrt{36} \quad D_{\overline{AE}} = 6$

$D_{\overline{EB}}: \sqrt{(-3+5)^2+(5-2)^2}$

$: \sqrt{13} \quad D_{\overline{EB}} = \sqrt{13}$

$D_{\overline{AB}}: \sqrt{(-3+5)^2+(-1-2)^2}$

$: \sqrt{13} \quad D_{\overline{AB}} = \sqrt{13}$

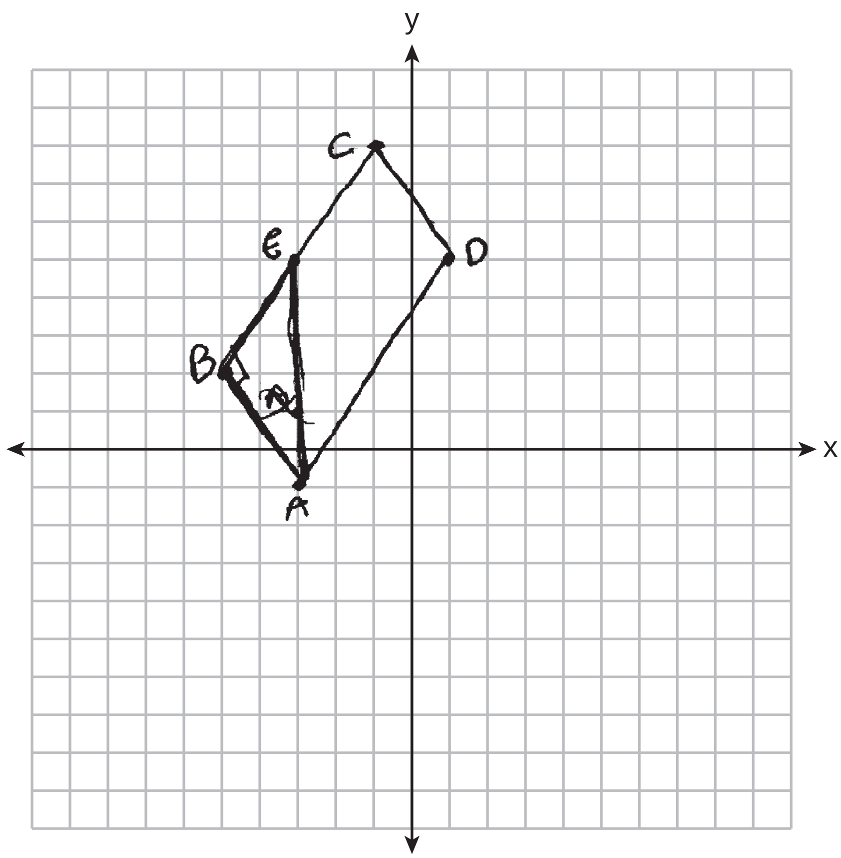
Equal

$\text{Slope}_{\overline{BE}}: \frac{5-2}{-3+5} = \frac{3}{2}$

$\text{Slope}_{\overline{BA}}: \frac{-1-2}{-3+5} = \frac{-3}{2}$

~~perp~~ $\perp$

$\therefore \triangle ABE$ is an isosoceles triangle b/c it has 2 equal sides and 90° $\angle$. $\perp$ lines form rt. $\angle$'s.



35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$m\overline{BA} = \frac{2+1}{-5+3} = \boxed{\frac{3}{-2}}$

$\boxed{D(x,y) = (1,5)}$

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$E(x,y) = (-3,5)$

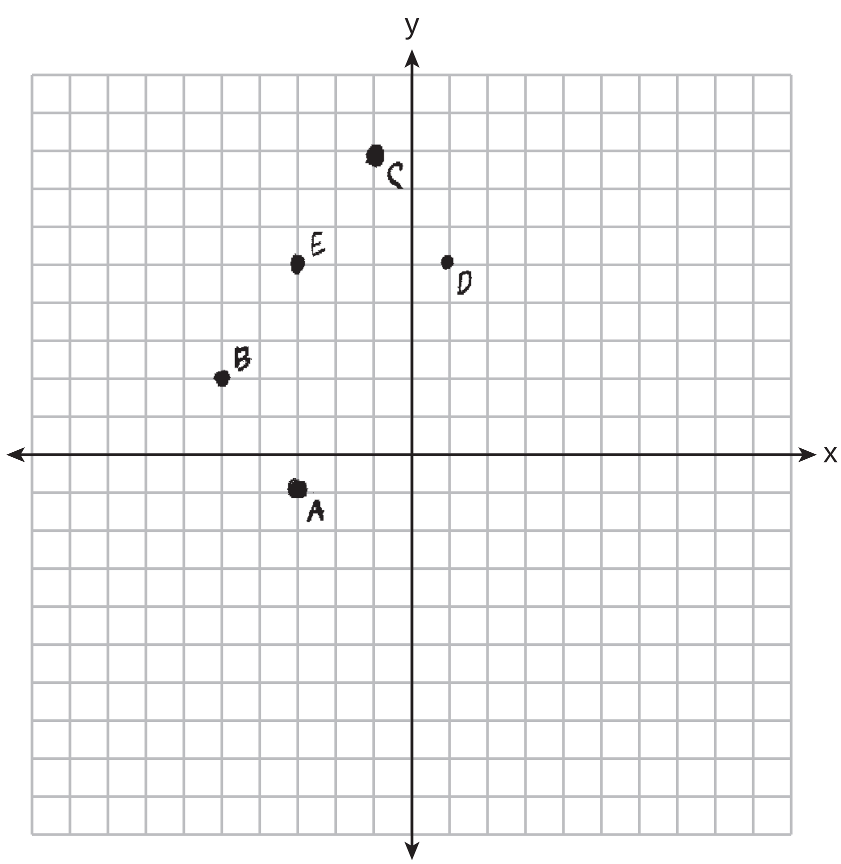
Question 35 is continued on the next page.

Score 3: The student correctly determined the coordinates of points D and E and correctly determined the lengths of $\overline{AB}$ and $\overline{EB}$.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$$d\overline{BA} = \sqrt{(-5+3)^2+(2+1)^2} \rightarrow \sqrt{(-2)^2+3^2} \rightarrow \sqrt{4+9} = \boxed{\sqrt{13}}$$

$$d\overline{BE} = \sqrt{(-5+3)^2+(2-5)^2} \rightarrow \sqrt{(-2)^2+(-3)^2} \rightarrow \sqrt{4+9} = \boxed{\sqrt{13}}$$



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

(1,5)

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$m\overline{BA} = \frac{-2}{3}$

$m\overline{CD} = \frac{-2}{3}$

$m\overline{CB} = \frac{4}{6}$

$m\overline{AD} = \frac{4}{6}$

ABCD is a parallelogram

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

(-3,5)

Question 35 is continued on the next page.

Score 3: The student made an error when determining the slopes of the four sides of $ABCD$. The student wrote an incomplete conclusion when proving $ABCD$ is a parallelogram. The student did not show enough work when determining the lengths of $\overline{AB}$ and $\overline{EB}$.

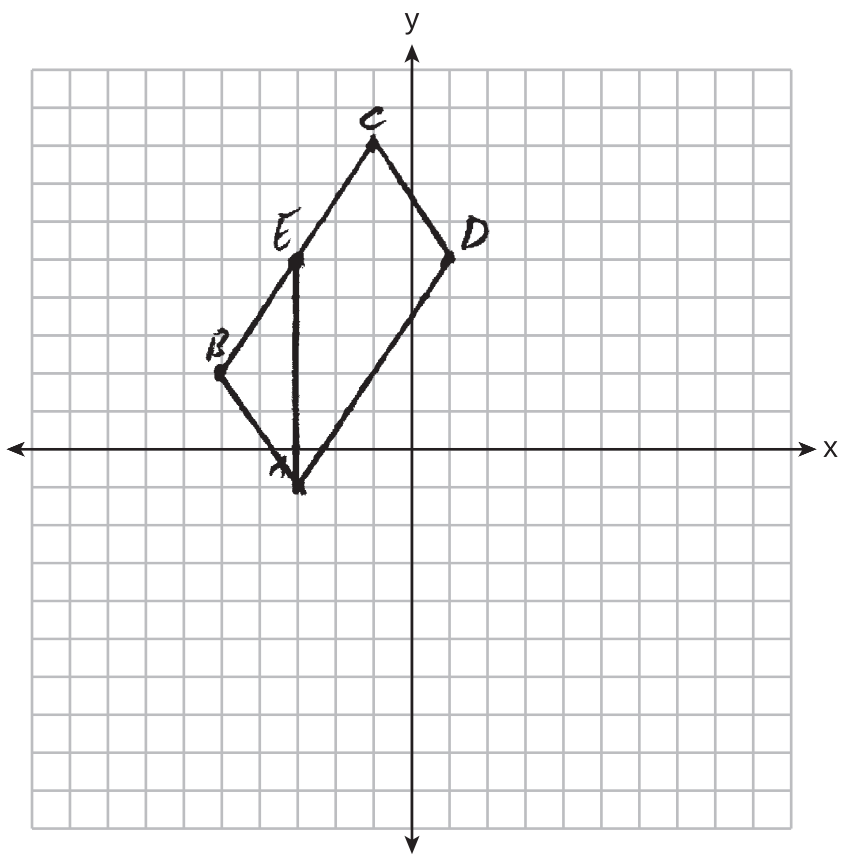
Question 35 continued.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

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

$EB = \sqrt{(2)^2 + (3)^2} = \sqrt{13}$

$\triangle ABE$ is an isosceles triangle because it has 2 congruent sides



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

D(1,5)

B → C $\quad$ A → D

↑6 → 4 $\quad$ ↑6 → 4

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

BC + AD have the same slope 6/4

def of Parallel lines

// lines make a Parallelogram

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

B(-5,2) C(-1,8)

$$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) \qquad \left(\frac{-6}{2}, \frac{10}{2}\right)$$

$$\left(\frac{-5+(-1)}{2}, \frac{2+8}{2}\right) \qquad E(-3,5)$$

Question 35 is continued on the next page.

Score 2: The student correctly determined the coordinates of points D and E.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

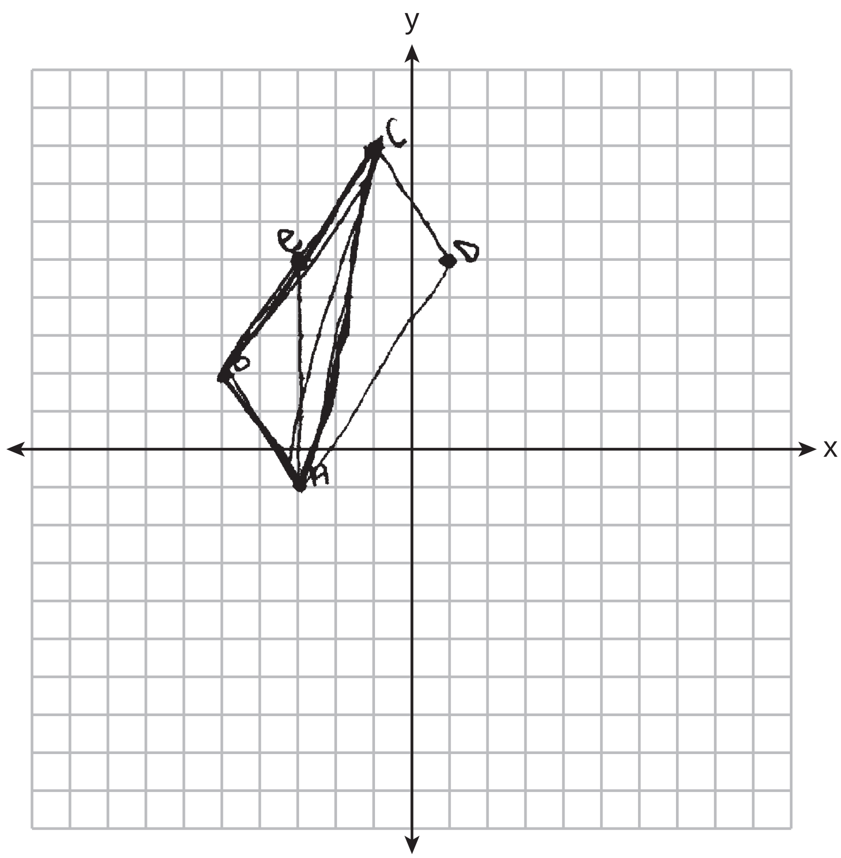
$\measuredangle$ eba is a right angle 90°

making $\measuredangle e$ + $\measuredangle A$ 45°

$90^\circ + 45^\circ + 45^\circ = 180^\circ$ ✓

$\measuredangle e$ + $\measuredangle a$ are $\cong$ def of isosceles Δ

6/4



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$(1,5)$

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$a^2+b^2=c^2$

$\overline{BA}$: $3^2+2^2=c^2$, $9+4$, $\sqrt{13}=\sqrt{c^2}$, $\sqrt{13}=c$

$\overline{DA}$: $6^2+4^2=c^2$, $36+16$, $\sqrt{52}=\sqrt{c^2}$, $\sqrt{52}=c$

$\overline{CD}$: $3^2+2^2=c^2$, $9+4$, $\sqrt{13}=\sqrt{c^2}$, $\sqrt{13}=c$

$\overline{BC}$: $6^2+4^2=c^2$, $36+16=c^2$, $\sqrt{52}=\sqrt{c^2}$, $\sqrt{52}=c$

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$M=\left(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2}\right)$

$\left(\frac{-1+5}{2}, \frac{\cancel{8}+2}{2}\right)$

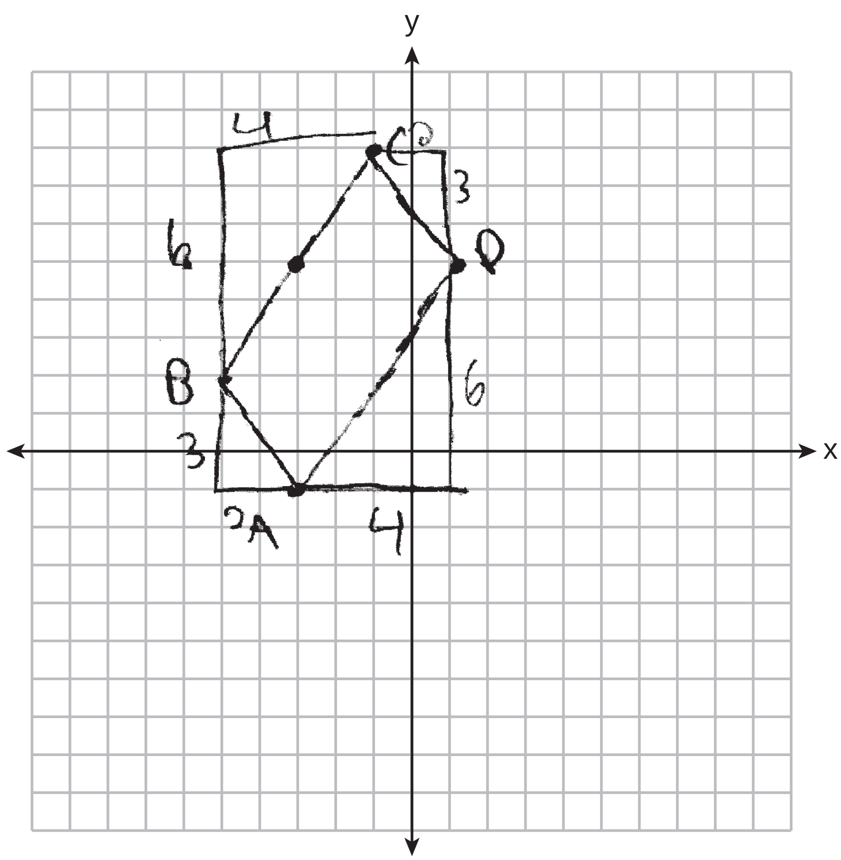
$(-6, 5)$

$B\ (\overset{1}{-5}, 2)\ C\ (\overset{2}{-1}, 8)$
$x\ y \quad x\ y$

Question 35 is continued on the next page.

Score 2: The student correctly determined the coordinates of point D and correctly determined the lengths of the four sides of $ABCD$.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

(1, 5)

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$D_{BC} = \sqrt{4^2+6^2} = \sqrt{16+36} = \sqrt{52}$

$D_{AD} = \sqrt{4^2+6^2} = \sqrt{16+36} = \sqrt{52}$

$D_{CD} = \sqrt{2^2+3^2} = \sqrt{4+9}\ \sqrt{13}$

$D_{BA} = \sqrt{2^2+3^2} = \sqrt{4+9}\ \sqrt{13}$

$\overline{BC} \parallel \overline{AD}$

$\overline{BA} \parallel \overline{CD}$

All sides are parallel so it makes a parallelogram

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$\dfrac{-5 + -1}{2}, \dfrac{2+8}{2}$

$-3, 5$

Question 35 is continued on the next page.

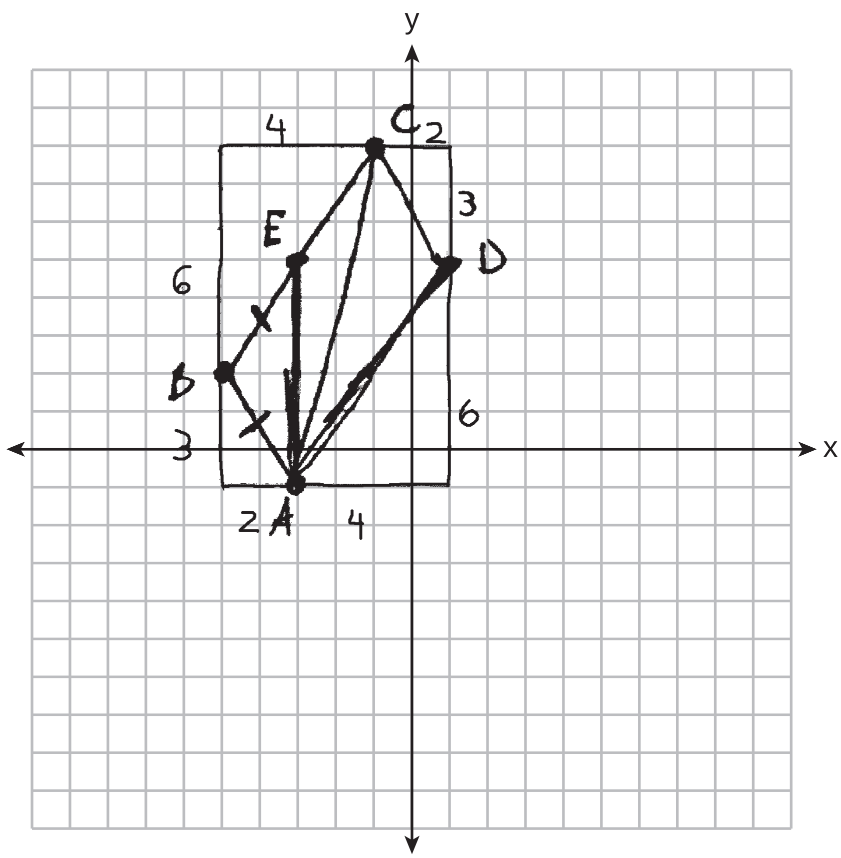
Score 2: The student wrote an incorrect concluding statement when proving $ABCD$ is a parallelogram. The student did not state point E as a coordinate. The student did not prove $\triangle ABE$ is isosceles.

Question 35 continued.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

$\overline{BE} \cong \overline{BA}$

The base sides are congruent which makes the triangle isosceles



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

(1, 5)

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$\frac{2--1}{-5--3} = \boxed{-\frac{3}{2}}$ $\frac{8-2}{-1--5} = \boxed{-\frac{3}{2}}$

$\frac{5-8}{1--1} = \boxed{-\frac{3}{2}}$ $\frac{-1-5}{1--3} = \boxed{-\frac{3}{2}}$

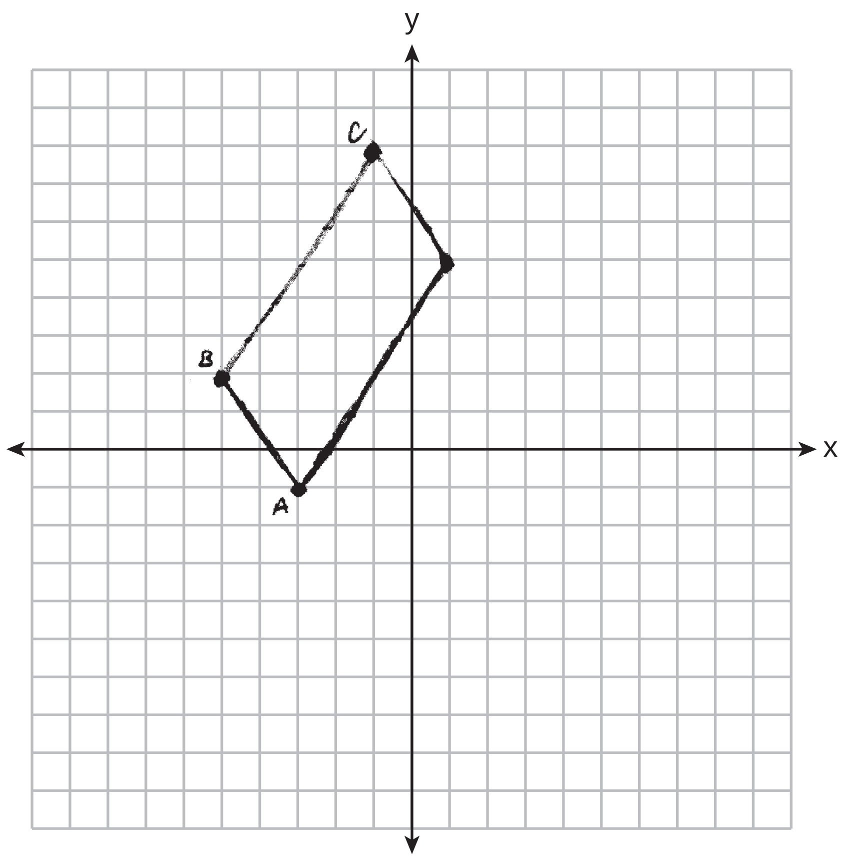
Δ ABCD is a parrelogram because they all have the same slope.

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

Question 35 is continued on the next page.

Score 1: The student correctly determined the coordinates of point D.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

$$m = \frac{x^2 - y_2}{2} + \frac{y_1 - x_1}{2}$$

$$m = \frac{8-2}{2} + \frac{-1-5}{2}$$

$$m = (3, -3)$$

Question 35 is continued on the next page.

Score 0: The student did not show enough correct relevant work to receive any credit.

Question 35 continued.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]

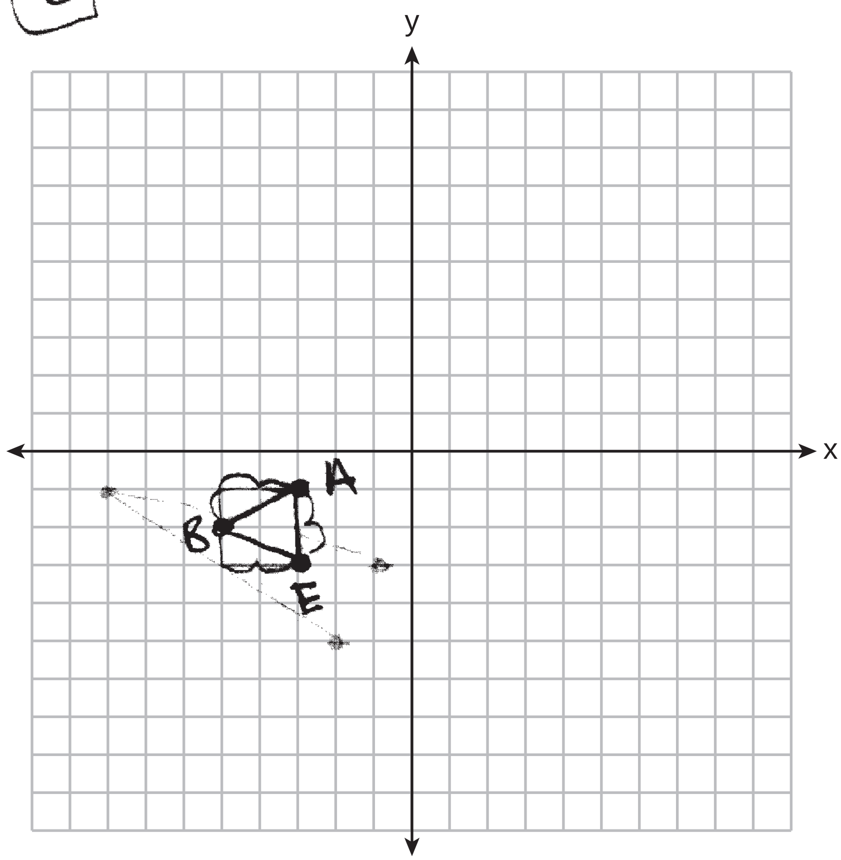
$a^2+b^2=c^2$
$2^2+2^2=c^2$
$4+4=c^2$
$\sqrt{8}=\sqrt{c^2}$
$\boxed{8}$

A(-3,-1)
B(-5,2)
E(3,-3)

$a^2+b^2=c^2$
$2^2+2^2=c^2$
$4+4=c^2$
$\sqrt{8}=\sqrt{c^2}$
$\boxed{8}$

$a^2+b^2=c^2$
$2^2+2^2=c^2$
$4+4=c^2$
$\sqrt{8}=\sqrt{c^2}$
$\boxed{8}$

All sides are equal.



Question 35

35 Triangle ABC has vertices whose coordinates are $A(-3, -1)$, $B(-5, 2)$, and $C(-1, 8)$.

State the coordinates of point D such that quadrilateral $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

D(-3,5)

Prove $ABCD$ is a parallelogram.
[The use of the set of axes on the next page is optional.]

$\overline{BC} \parallel \overline{AB}$

$\overline{DE} \perp \overline{BA}$

State the coordinates of point E, the midpoint of $\overline{BC}$.
[The use of the set of axes on the next page is optional.]

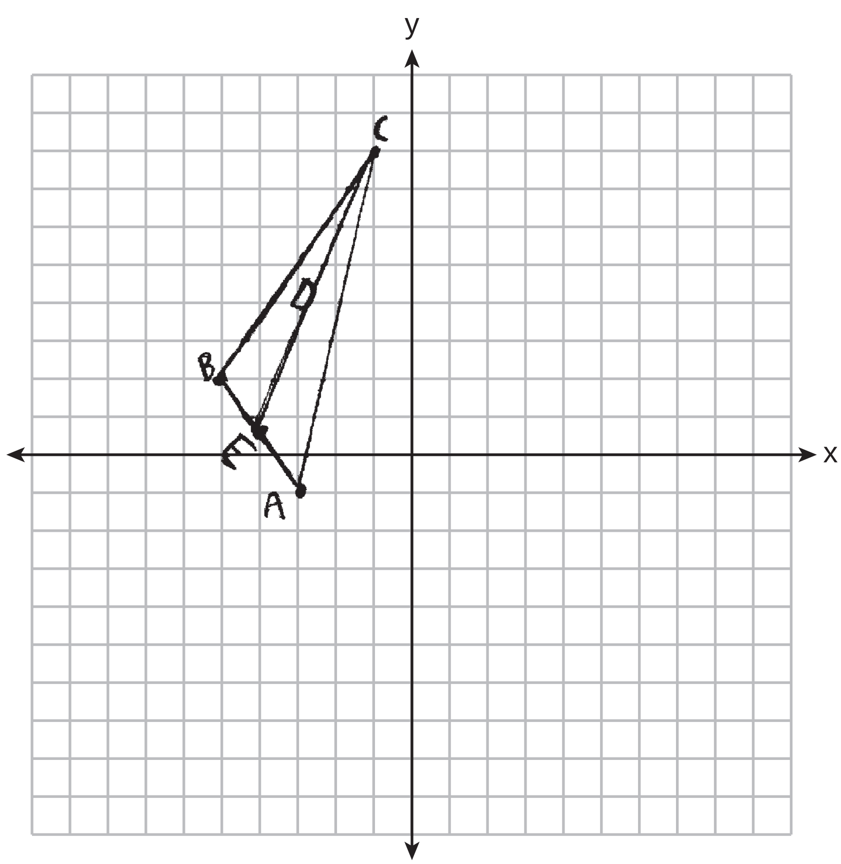
E(-4,1)

Question 35 is continued on the next page.

Score 0: The student did not show enough correct relevant work to receive any credit.

Question 35 continued.

Prove $\triangle ABE$ is an isosceles triangle.
[The use of the set of axes below is optional.]



The State Education Department / The University of the State of New York

Regents Examination in Geometry – JUNE 2026

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

(Use for the June 2026 exam only.)

Raw Score	Scale Score	Performance Level
80	**100**	5
79	**99**	5
78	**97**	5
77	**96**	5
76	**95**	5
75	**93**	5
74	**92**	5
73	**91**	5
72	**90**	5
71	**89**	5
70	**88**	5
69	**87**	5
68	**86**	5
67	**86**	5
66	**85**	5
65	**84**	4
64	**83**	4
63	**83**	4
62	**82**	4
61	**81**	4
60	**80**	4
59	**80**	4
58	**79**	3
57	**79**	3
56	**78**	3
55	**77**	3
54	**77**	3

Raw Score	Scale Score	Performance Level
53	**76**	3
52	**75**	3
51	**75**	3
50	**74**	3
49	**73**	3
48	**73**	3
47	**72**	3
46	**72**	3
45	**71**	3
44	**70**	3
43	**70**	3
42	**69**	3
41	**68**	3
40	**68**	3
39	**67**	3
38	**66**	3
37	**66**	3
36	**65**	3
35	**64**	2
34	**63**	2
33	**63**	2
32	**62**	2
31	**61**	2
30	**60**	2
29	**59**	2
28	**58**	2
27	**57**	2

Raw Score	Scale Score	Performance Level
26	**57**	2
25	**56**	2
24	**55**	2
23	**53**	1
22	**52**	1
21	**51**	1
20	**50**	1
19	**48**	1
18	**47**	1
17	**46**	1
16	**44**	1
15	**42**	1
14	**41**	1
13	**39**	1
12	**37**	1
11	**35**	1
10	**32**	1
9	**30**	1
8	**27**	1
7	**25**	1
6	**22**	1
5	**19**	1
4	**15**	1
3	**12**	1
2	**8**	1
1	**4**	1
0	**0**	1

To determine the student’s final examination score (scale 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.