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

GEOMETRY

Wednesday, January 21, 2026 — 9:15 a.m. to 12:15 p.m., only

Student Name: ____

School Name: ____

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

Print your name and the name of your school on the lines above.

A separate answer sheet for **Part I** has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet.

This examination has four parts, with a total of 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.

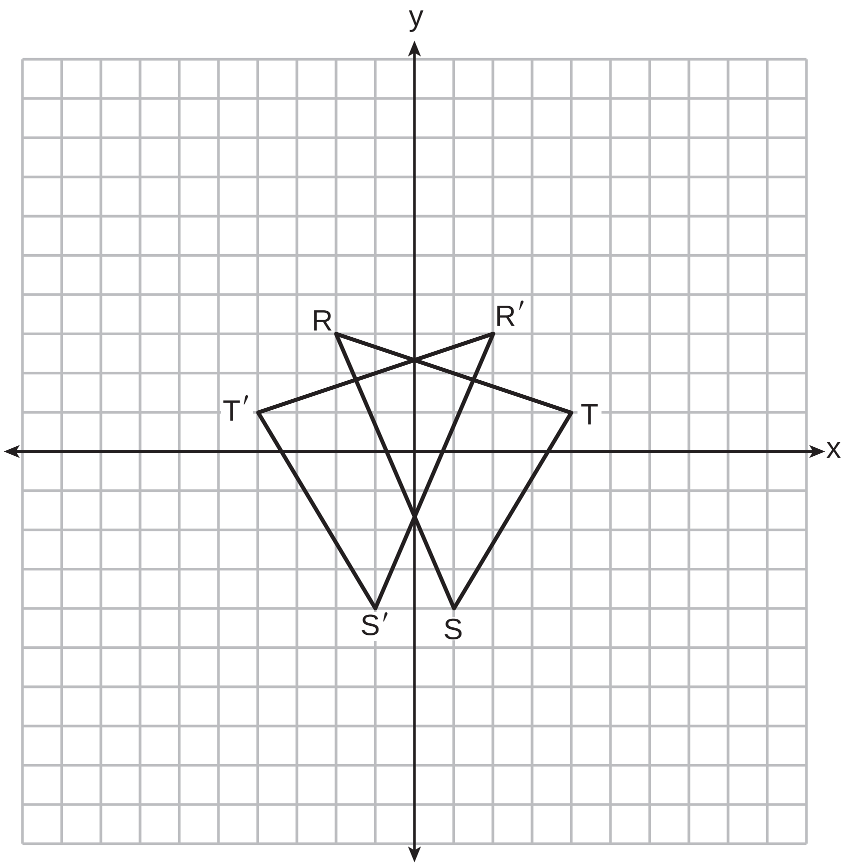
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

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 On the set of axes below, $\triangle RST$ and its image, $\triangle R'S'T'$, are graphed.



Which rigid motion is sufficient to prove $\triangle RST \cong \triangle R'S'T'$?

(1) a rotation of 90° clockwise about the origin

(2) a translation 4 units to the right

(3) a reflection over the x-axis

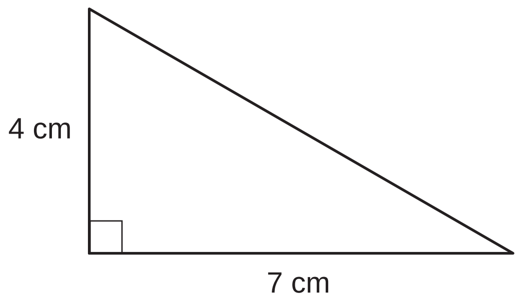
(4) a reflection over the y-axis

Use this space for computations.

2 Which regular polygon would carry onto itself after a rotation of 60° about its center?

(1) pentagon
(2) hexagon
(3) octagon
(4) decagon

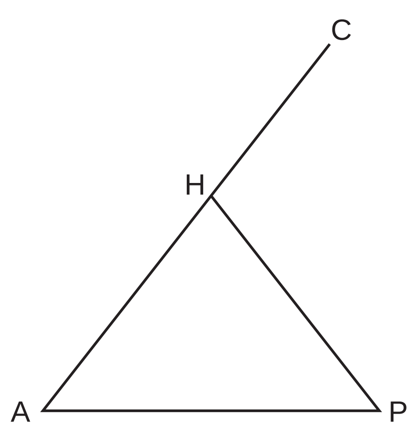
3 The right triangle below is continuously rotated about the 4 cm side.



The solid formed is

(1) a cone with a height of 4 cm and a radius of 7 cm
(2) a cone with a height of 4 cm and a radius of 14 cm
(3) a pyramid with a height of 4 cm and a base length of 7 cm
(4) a pyramid with a height of 4 cm and a base length of 14 cm

4 In isosceles triangle *AHP* below, $\overline{AH} \cong \overline{PH}$, and $\overline{AH}$ is extended through *H* to *C*.

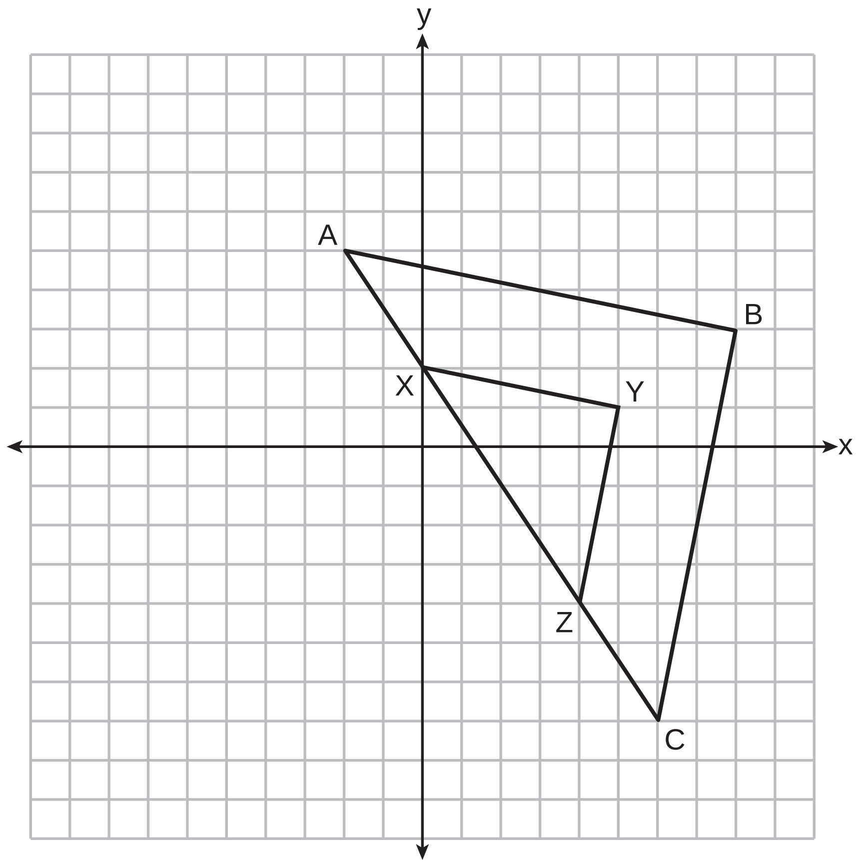


If $m\angle A = (2x + 12)^\circ$ and $m\angle P = (3x - 8)^\circ$, what is the measure of $\angle CHP$?

(1) 52°
(2) 76°
(3) 104°
(4) 128°

Use this space for computations.

5 In the diagram below, $\triangle XYZ$ is the image of $\triangle ABC$ after a dilation of scale factor $\frac{1}{2}$.



Which point must be the center of dilation?

(1) $(2, -1)$ (3) $(5, 1)$

(2) $(8, 3)$ (4) $(0, 0)$

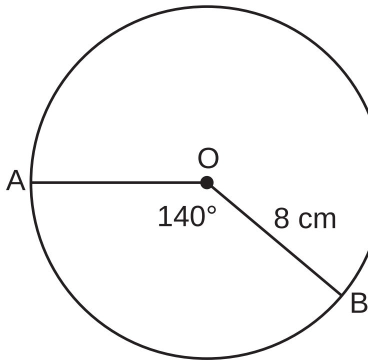
6 In a right triangle, the acute angles have the relationship $\cos(5x + 7)° = \sin(3x + 3)°$. Which equation is always true?

(1) $5x + 7 = 3x + 3$ (3) $5x + 7 + 3x + 3 = 180$

(2) $5x + 7 + 3x + 3 = 90$ (4) $5x + 7 + 3x + 3 + x = 180$

Use this space for computations.

7 In the diagram below, circle O has a radius of 8 cm and a central angle that measures 140°.



What is the length of $\widehat{AB}$, to the *nearest centimeter*?

(1) 10 (3) 25

(2) 20 (4) 78

8 Lucy wants to use a wagon to move a pile of sand in as few trips as possible. The pile of sand can be modeled by a cone, as shown below. The height and radius of the sandpile are both 3.5 feet.

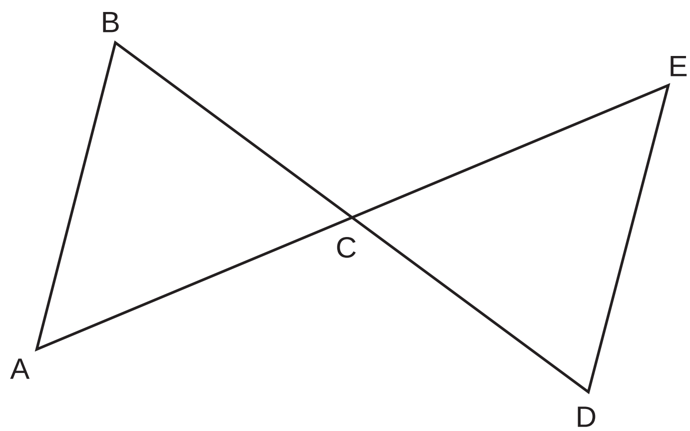
If the wagon holds 5 cubic feet of sand, what is the fewest number of trips Lucy needs to make to move the entire pile of sand?

(1) 27 (3) 3

(2) 14 (4) 9

Use this space for computations.

9 In the diagram below, $\overline{BD}$ and $\overline{AE}$ intersect at C, and $\overline{AB}$ and $\overline{DE}$ are drawn.



If $\overline{AB} \parallel \overline{DE}$, which statement is *not* always true?

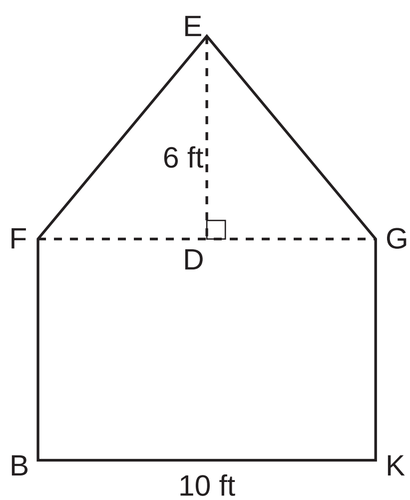
(1) $\angle ABC \cong \angle EDC$

(2) $\angle ACB \cong \angle ECD$

(3) $\triangle ABC \sim \triangle EDC$

(4) $\triangle ABC \cong \triangle EDC$

10 The face of a shed is modeled below. The rectangular section of the face, $BFGK$, is 10 feet wide. The triangular section of the face, FEG, is an isosceles triangle with vertex angle FEG and a height of 6 feet.



What is m$\angle EGD$, to the *nearest degree*?

(1) 34°

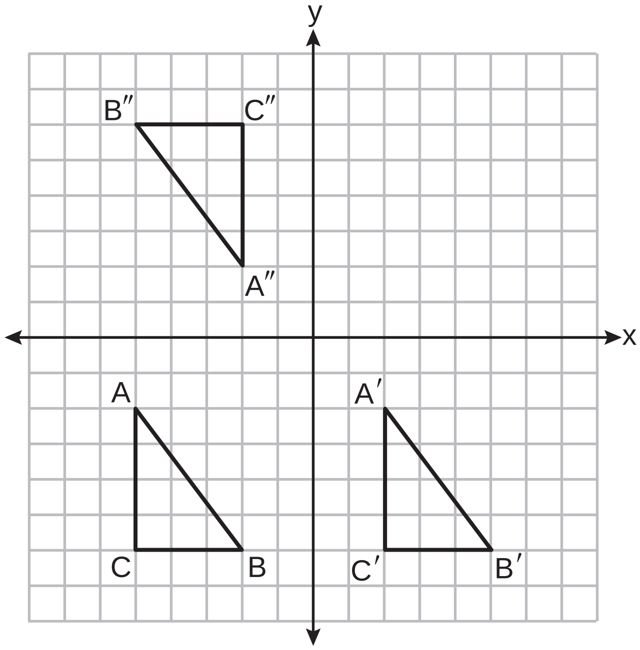
(2) 40°

(3) 50°

(4) 56°

Use this space for computations.

11 Triangles ABC, $A'B'C'$, and $A''B''C''$ are graphed on the set of axes below.



Which sequence of transformations maps $\triangle ABC$ onto $\triangle A'B'C'$, and then maps $\triangle A'B'C'$ onto $\triangle A''B''C''$?

(1) a translation followed by a rotation

(2) a rotation followed by a translation

(3) a line reflection followed by a rotation

(4) a translation followed by a line reflection

12 A line contains the points $(-1, -4)$ and $(3, -1)$. An equation of a line perpendicular to this line is

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

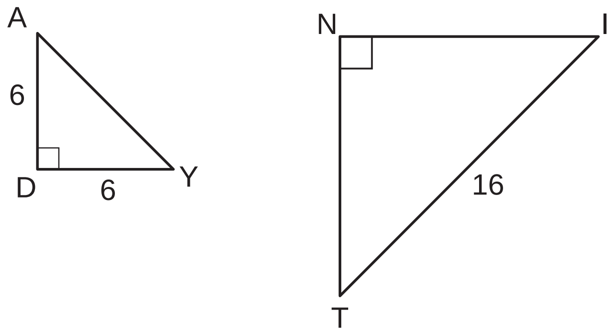
(2) $y - 4 = \frac{4}{3}(x - 1)$

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

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

Use this space for computations.

13 In the diagram below of right triangles DAY and NIT, $AD = 6$, $DY = 6$, $IT = 16$, and $\triangle DAY \sim \triangle NIT$.



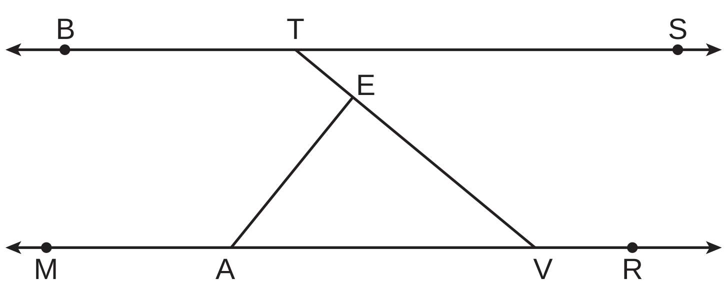
The length of $\overline{TN}$ is

(1) 8
(2) $8\sqrt{2}$
(3) $8\sqrt{3}$
(4) $16\sqrt{2}$

14 The volume of a sphere is 333 cm^3. To the *nearest tenth of a centimeter*, the diameter of the sphere is

(1) 4.3
(2) 5.2
(3) 8.6
(4) 10.4

15 Line BTS is parallel to line $MAVR$, as shown in the diagram below, and $\overline{AE} \perp \overline{TV}$.



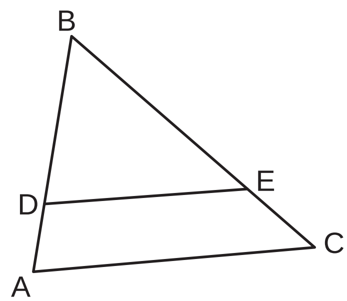
If $m\angle STE = 38°$, what is the measure of $\angle VAE$?

(1) 38°
(2) 52°
(3) 128°
(4) 142°

16 Segment RAZ has endpoints with coordinates $R(6, 6)$ and $Z(-12, -3)$. If A divides $\overline{RZ}$ such that $RA{:}AZ = 5{:}4$, then the coordinates of A are

(1) $(-6, 0)$
(2) $(-2, 2)$
(3) $(0, 3)$
(4) $(-4, 1)$

17 In $\triangle ABC$ below, points D and E are on $\overline{AB}$ and $\overline{CB}$ respectively, such that $\overline{DE} \parallel \overline{AC}$.



If $BD = 9$, $DA = 3$, and $EC = 4$, what is the length of $\overline{BC}$?

(1) 10
(2) 12
(3) 14
(4) 16

18 Triangle ABC is mapped onto $\triangle A'B'C'$ after a sequence of rigid motions. Which statement is always true?

(1) Segment AB is parallel to segment $A'B'$.
(2) Segment AB is congruent to segment $A'B'$.
(3) The measure of angle A is the same as the measure of angle B'.
(4) The orientation of $\triangle ABC$ is the same as the orientation of $\triangle A'B'C'$.

Use this space for computations.

19 What are the coordinates of the center and the length of the radius of the circle whose equation is $x^2 - 16x + y^2 + 20y = -155$?

(1) center $(8, -10)$ and radius 9

(2) center $(-8, 10)$ and radius 9

(3) center $(8, -10)$ and radius 3

(4) center $(-8, 10)$ and radius 3

20 State populations and land areas from the 2020 US Census are shown in the table below.

2020 State Population and Land Area		
State	**Population**	**Land Area** (mi^2)
Connecticut	3,605,944	4,842
New Jersey	9,288,994	7,354
New York	20,201,249	47,126
Pennsylvania	13,002,700	44,743

Which list shows the state population densities, in order from smallest to largest?

(1) Pennsylvania, New York, Connecticut, New Jersey

(2) Connecticut, New Jersey, Pennsylvania, New York

(3) New York, Pennsylvania, New Jersey, Connecticut

(4) New Jersey, Connecticut, New York, Pennsylvania

21 Line t is represented by the equation $y = 2x - 1$. If the line is dilated by a scale factor of 3 centered at the origin, which equation represents the image of line t after the dilation?

(1) $y = 2x - 3$

(2) $y = 6x - 3$

(3) $y = 2x - 1$

(4) $y = 6x - 1$

Use this space for computations.

22 Quadrilateral $ABCD$ is a parallelogram. Which additional statement is sufficient to prove $ABCD$ is a rhombus?

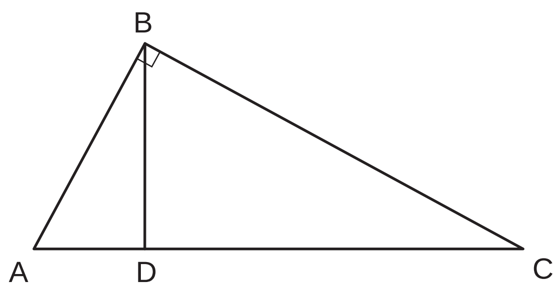
(1) $\overline{AB} \cong \overline{CD}$

(2) $\overline{AD} \parallel \overline{BC}$

(3) $\overline{AD} \cong \overline{DC}$

(4) $\angle ADC \cong \angle ABC$

23 In right triangle ABC below, $m\angle ABC = 90°$, and $\overline{BD} \perp \overline{ADC}$.



If $AD = 3$ and $CD = 12$, the length of $\overline{AB}$ is

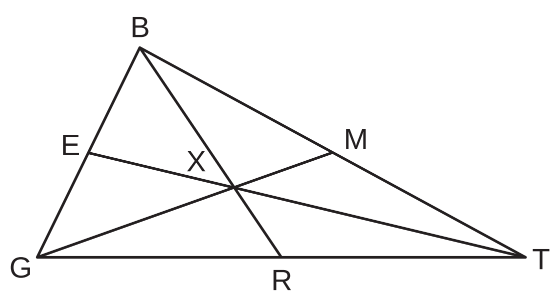
(1) 6

(2) 9

(3) $3\sqrt{5}$

(4) $5\sqrt{3}$

24 In $\triangle GBT$ shown below, $\overline{GXM}$, $\overline{BXR}$, and $\overline{TXE}$ are drawn such that point X is the centroid.



Which statement is always true?

(1) $\frac{MX}{GX} = \frac{1}{3}$

(2) $\frac{TX}{EX} = \frac{2}{1}$

(3) $\overline{BX} \cong \overline{RX}$

(4) $\overline{TM} \cong \overline{TR}$

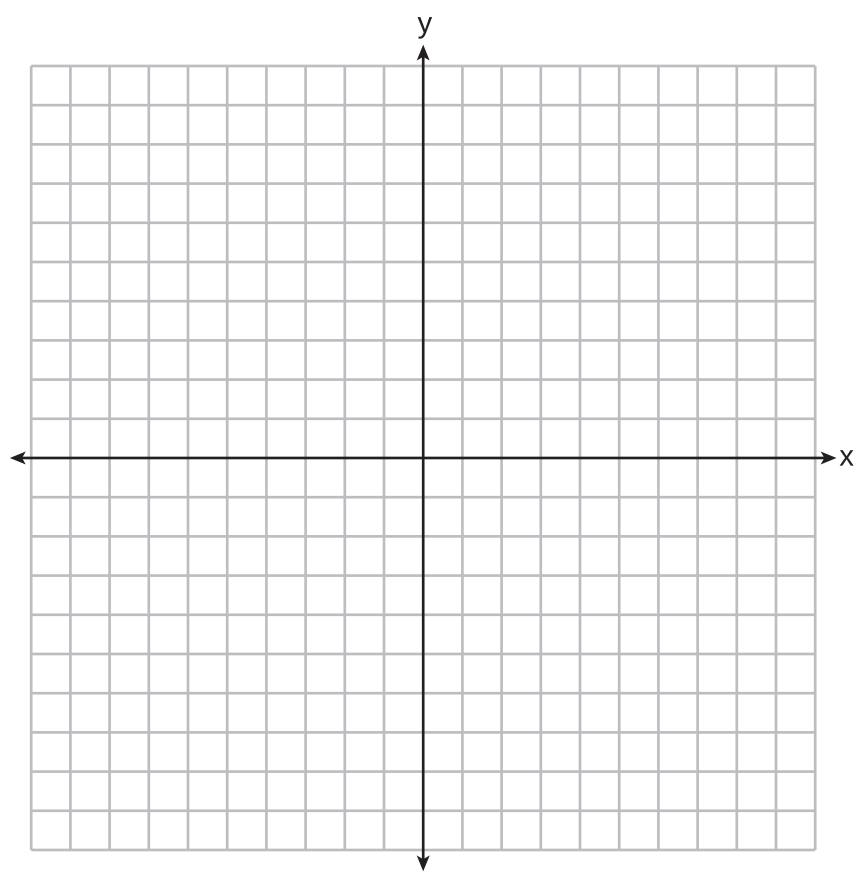
Part II

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 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]



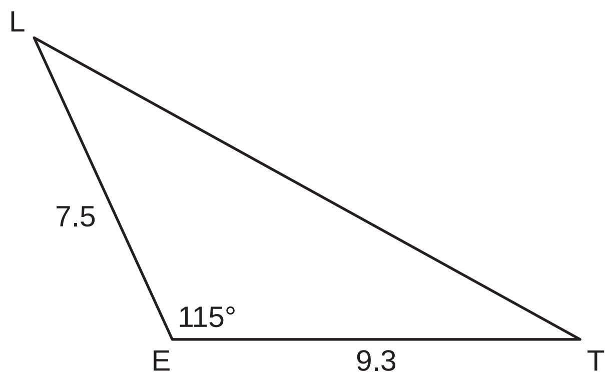
26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.

27 In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$.

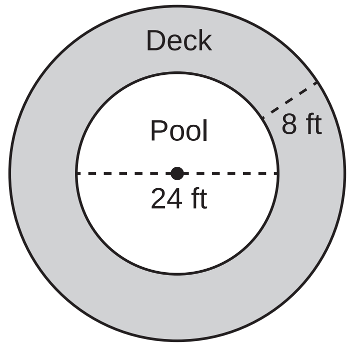
Determine and state the length of $\overline{SR}$, to the *nearest tenth*.

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.

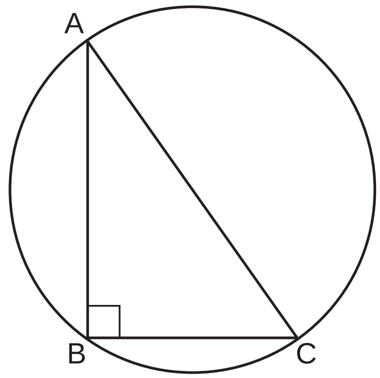


Determine and state the number of square feet of the deck, to the *nearest square foot*.

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

31 In the diagram below, right triangle ABC is inscribed in the circle with right angle ABC.

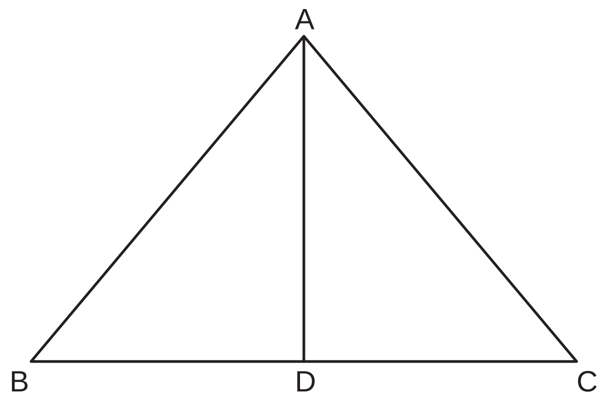


Explain why $\overline{AC}$ must be a diameter of the circle.

Part III

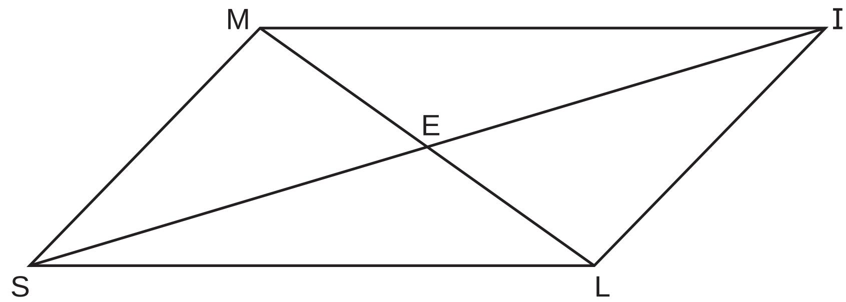
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily 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 In isosceles triangle *ABC* below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



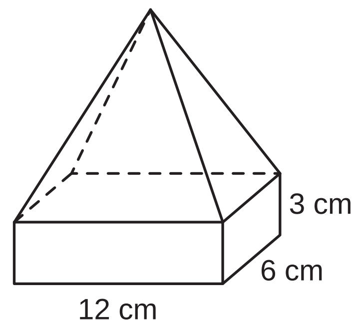
If $m\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

33 In quadrilateral $SMIL$ below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



Prove: $\triangle MIE \cong \triangle LSE$

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.

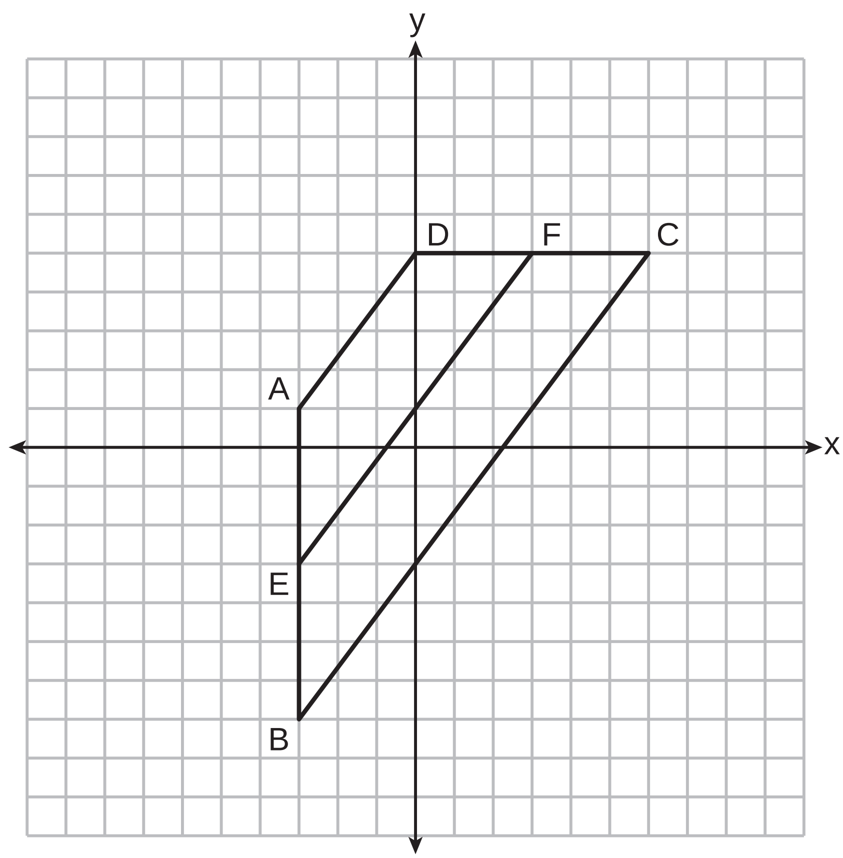


The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

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 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

Question 35 is continued on the next page.

Question 35 continued

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

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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 – January 2026

Scoring Key: Part I (Multiple-Choice Questions)

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

Regents Examination in Geometry – January 2026

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

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

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

The chart for determining students' final examination scores for the **January 2026 Regents Examination in Geometry** will be posted on the Department's web site at: **https://www.nysedregents.org/geometryre/** no later than January 21, 2026. 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

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

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Wednesday, January 21, 2026 — 9:15 a.m. to 12:15 p.m., only

RATING GUIDE

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site 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 web site 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 web site at: https://www.nysed.gov/state-assessment/high-school-regents-examinations by Wednesday, January 21, 2026. 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]** $(5, -3)$, $(3, -5)$, and $(1, -1)$ are stated, and correct work is shown.

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

or

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

or

[1] $(5, -3)$, $(3, -5)$, and $(1, -1)$ are stated, 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.

(26) **[2]** 27, 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 bucket, but no further correct work is shown.

or

[1] 27, 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]** 28.3, 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] A correct relevant trigonometric equation is written, but no further correct work is shown.

or

[1] 28.3, 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]** 31.6, 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] $\frac{1}{2}(7.5)(9.3)(\sin 115)$ or an equivalent expression is written, but no further correct work is shown.

or

[1] 31.6, 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]** 804, 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 area of the larger circle, but no further correct work is shown.

or

[1] 804, 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 sides of the triangle are not drawn.

[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]** 34.3, 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 length of all 3 sides of $\triangle ABC$, but no further correct work is shown.

[2] Appropriate work is shown, but two or more 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 one or more of the following lengths: $\overline{AB}$, $\overline{AC}$, $\overline{BD}$, $\overline{CD}$.

[1] A correct relevant trigonometric equation is written, but no further correct work is shown.

or

[1] 34.3, 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]** 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.

[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 written, 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.

(34) **[4]** 1140, and correct work is shown.

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

or

[3] Correct work is shown to find the total volume of the trophy, but no further correct work is shown.

or

[3] Correct work is shown to find the mass of the rectangular prism and the mass of the rectangular pyramid, but no further correct work is shown.

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

or

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

or

[2] Correct work is shown to find the volume of the rectangular prism and the rectangular pyramid, but no further correct work is shown.

or

[2] Correct work is shown to find the mass of the rectangular prism or the mass of the rectangular pyramid, but no further correct work is shown.

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

or

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

or

[1] 1140, 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.

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]** Correct work is shown to prove $ABCD$ is a trapezoid, $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$, and correct concluding statements are written. Yes is indicated, and a correct justification for $EF = \frac{1}{2}(AD + BC)$ is given.

[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.

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

or

[4] Correct work is shown to prove $ABCD$ is a trapezoid and $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$, but two concluding statements are missing or incorrect. Yes is indicated, and a correct justification for $EF = \frac{1}{2}(AD + BC)$ is given.

or

[4] Correct work is shown to prove $ABCD$ is a trapezoid and $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$. Correct concluding statements are written. No further correct work is shown.

or

[4] Correct work is shown to prove $ABCD$ is a trapezoid, and a correct concluding statement is written. Yes is indicated, and a correct justification for $EF = \frac{1}{2}(AD + BC)$ is given. No further correct work is shown.

or

[4] Correct work is shown to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$ and a correct concluding statement is written. Yes is indicated, and a correct justification for $EF = \frac{1}{2}(AD + BC)$ is given. No further correct work is shown.

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

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

or

[2] Correct work is shown to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$, and a correct concluding statement is written. No further correct work is shown.

or

[2] Yes is indicated, and correct justification for $EF = \frac{1}{2}(AD + BC)$ is given. No further correct work is shown.

[1] Correct work is shown to find the slopes of $\overline{AD}$ and $\overline{BC}$, but no further correct work is shown.

or

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

[0] Yes is indicated, but no work 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.

Map to the Learning Standards
Geometry
January 2026

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

The *Chart for Determining the Final Examination Score for the January 2026 Regents Examination in Geometry* will be posted on the Department's web site at: https://www.nysed.gov/state-assessment/high-school-regents-examinations 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

Wednesday, January 21, 2026 — 9:15 a.m. to 12:15 p.m., only

MODEL RESPONSE SET

Table of Contents

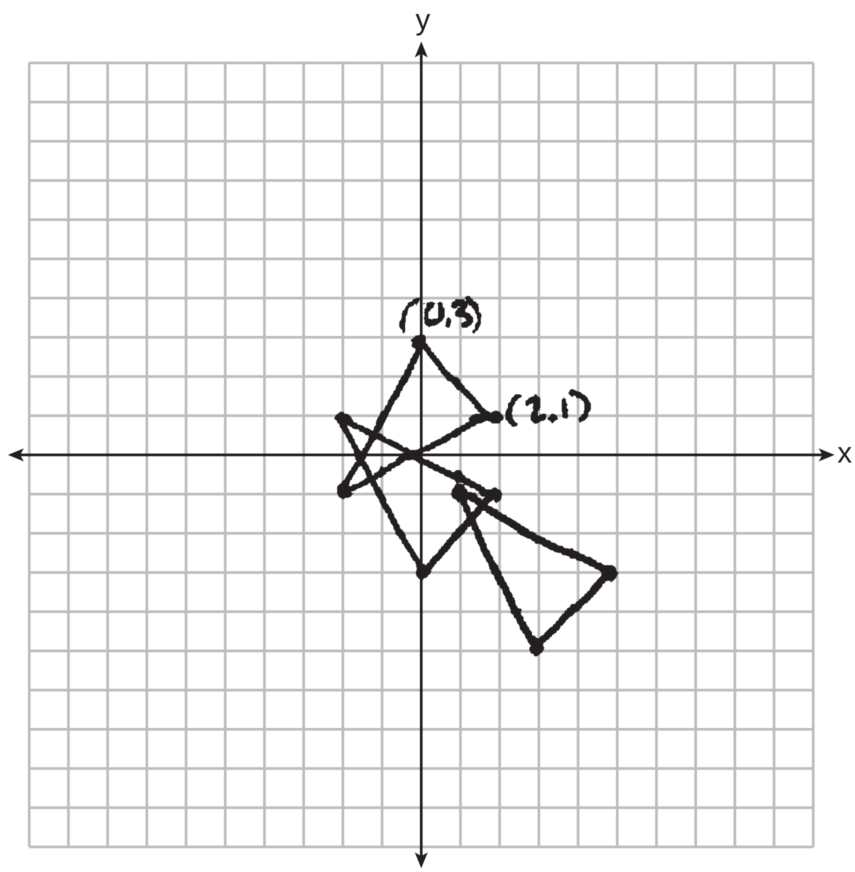
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

(1,-1)
(5,-3)
(3,-5)



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

Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

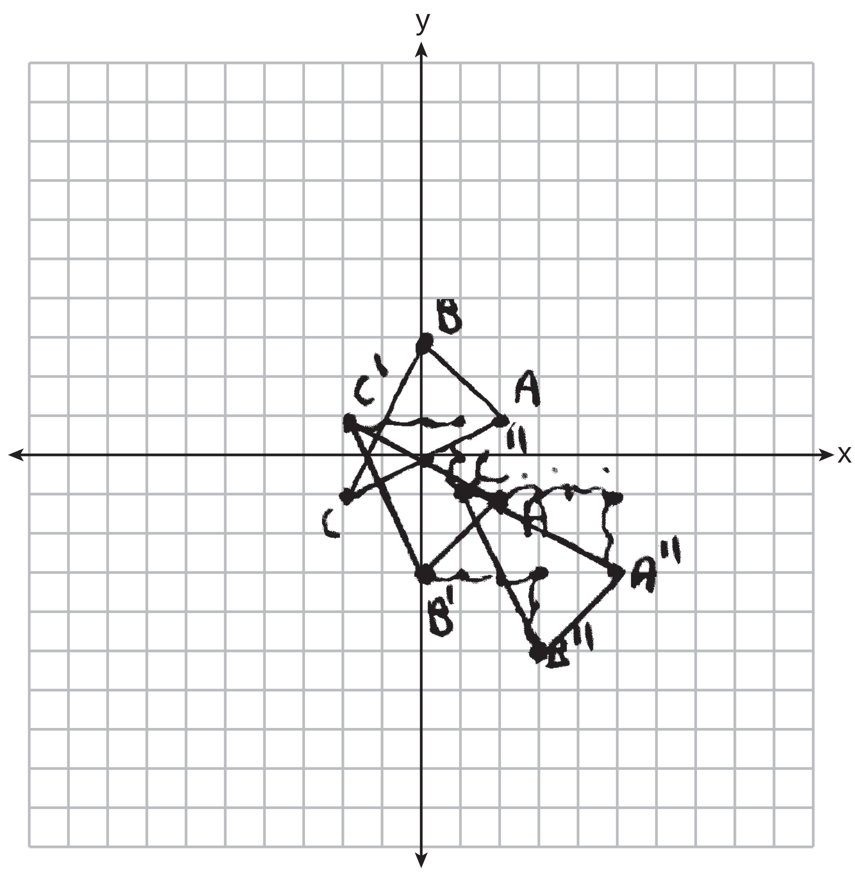
Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

A (2,1) B (0,3) C (−2,−1)

- Reflection over X Axis
- Translation 3 units right, 2 units down

$\boxed{A''(5,-3) \quad B''(3,-5) \quad C''(1,-1)}$



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

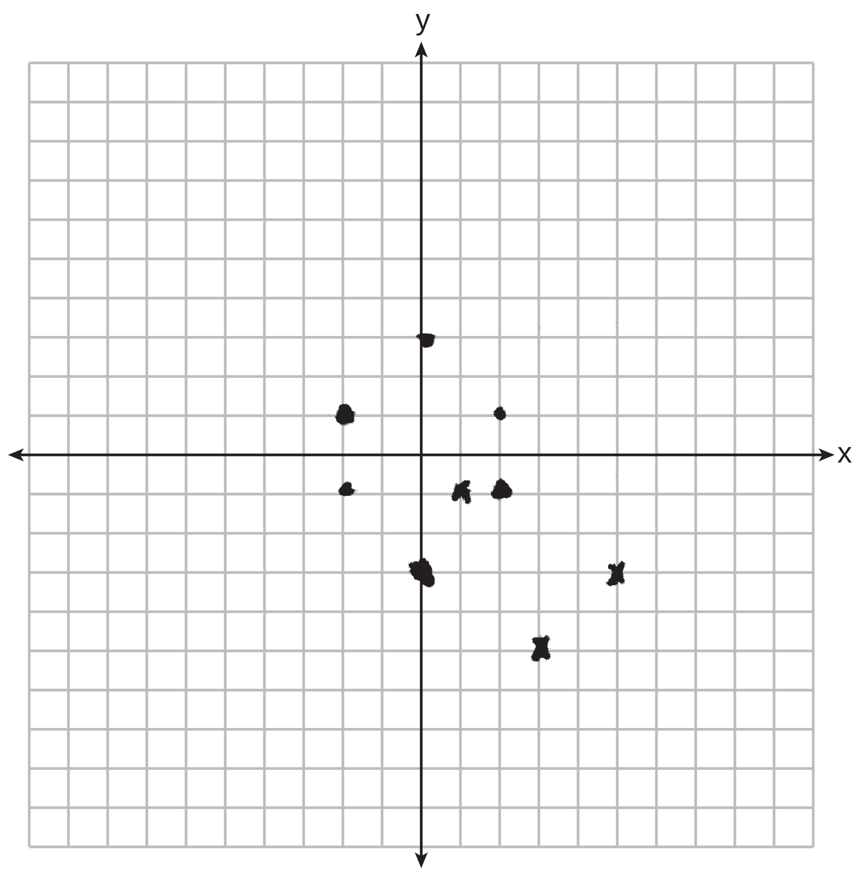
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

(1, −1), (5, −3), (3, −5)



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

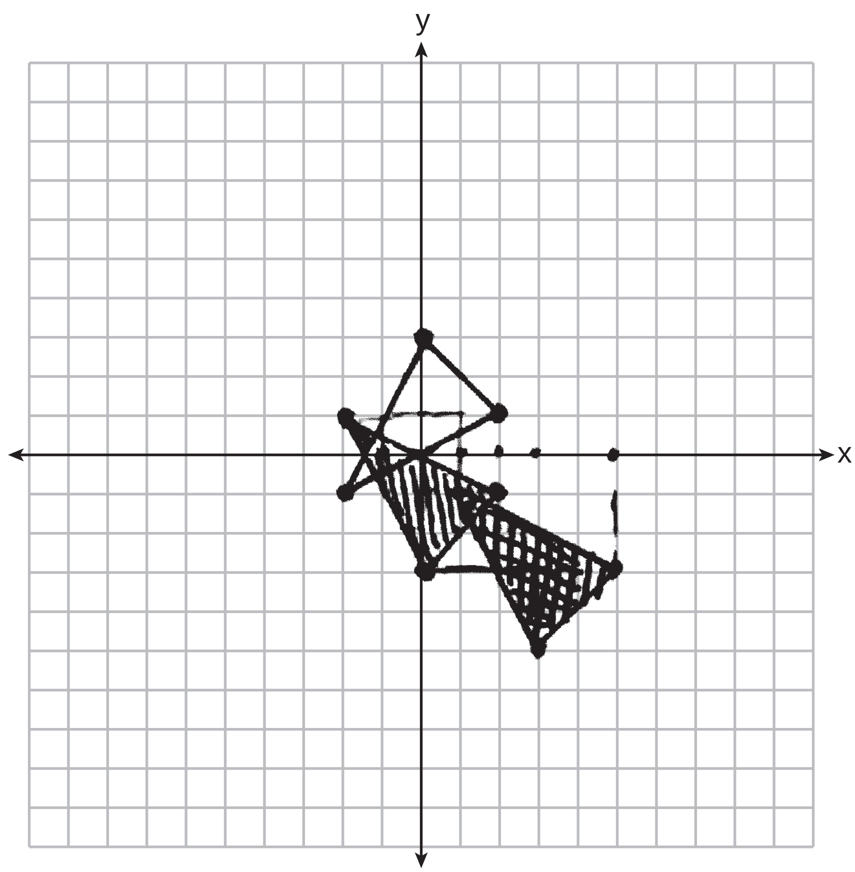
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

(2,1) → (2,−1) → (5,−3)
(0,3) → (0,−3) → (3,−5)
(−2,−1) → (−2,1) → (1,−1)



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

Question 25

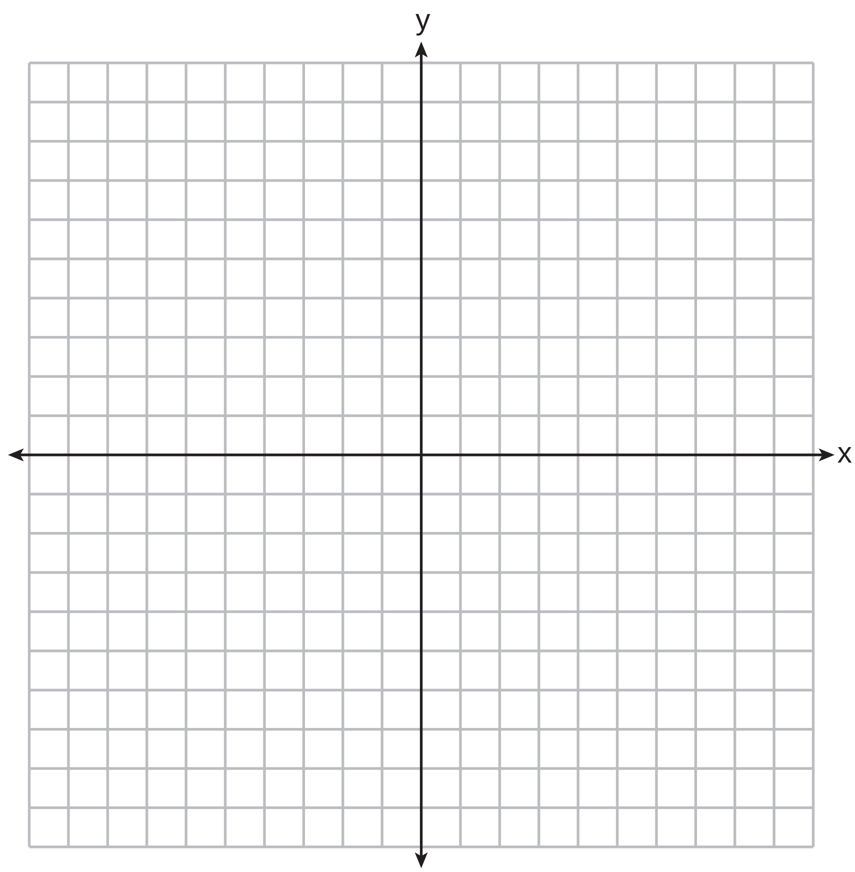
25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

reflect x axis Translate right 3 down 2

(2, 1) → (2, −1) → (5, −3)
(0, 3) → (0, −3) → (3, −5)
(−2, −1) → (−2, 1) → (1, −1)



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

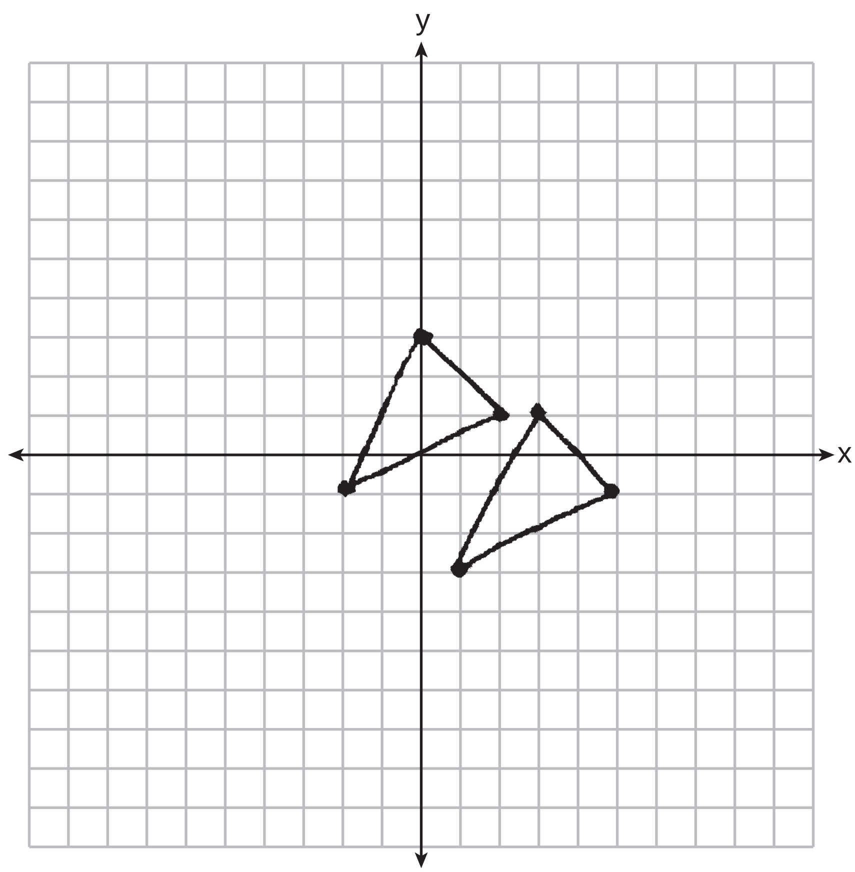
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the x-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

(5, -1) , (3, 1) , (1, -3)



Score 1: The student determined the coordinates of the vertices of the image of the triangle after translating 3 units to the right and 2 units down.

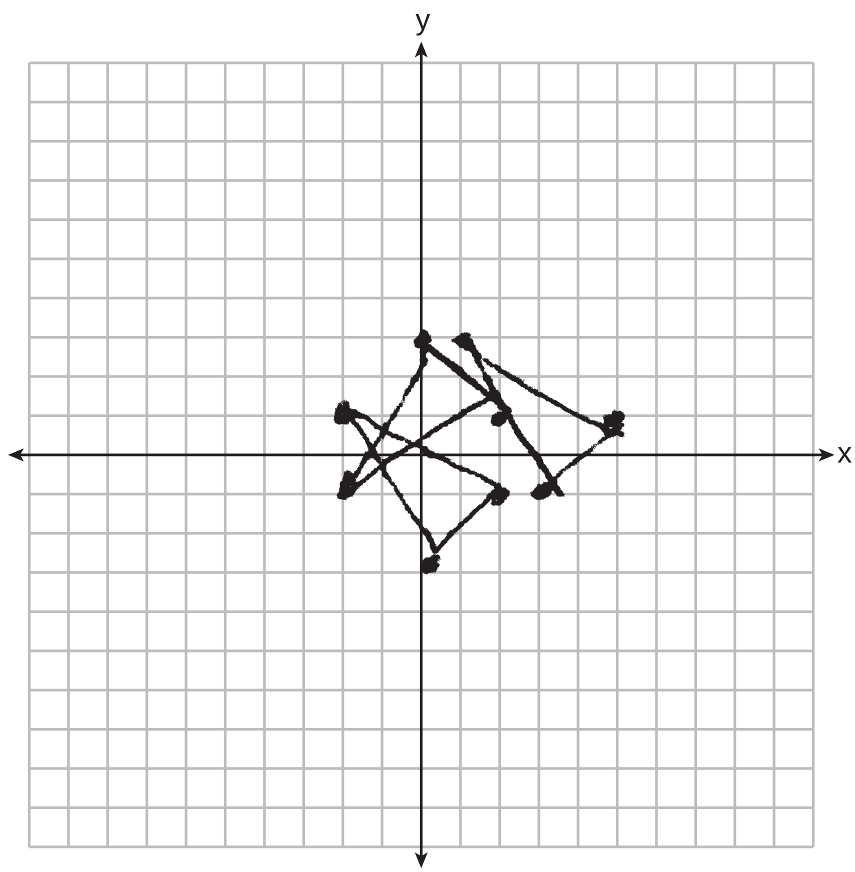
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

(3, -1), (5, 1), (1, 3)



Score 1: The student translated the image 3 units to the right and 2 units up.

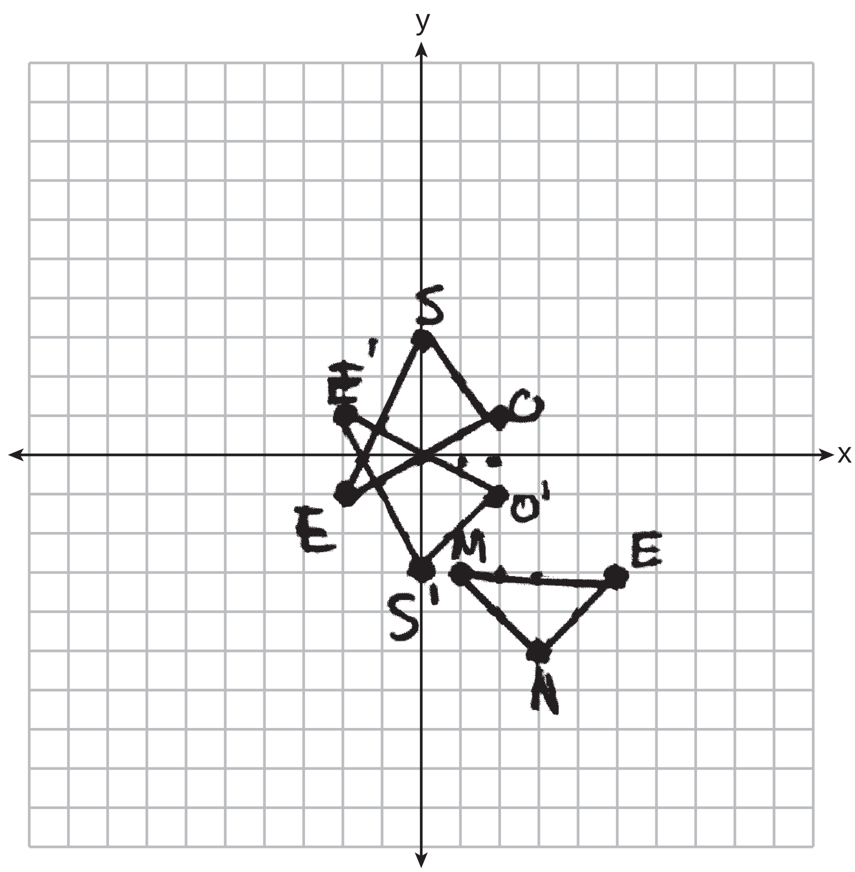
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

After a reflection over the x-axis & a translation 3 units right, 2 units down the new coordinates are (1, -3), (3, -5), & (5, -3)



Score 1: The student correctly reflected the triangle over the *x*-axis and then translated one point incorrectly.

Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

A B C

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

Reflection Translation

$(2,1) \longrightarrow (2,-1) \longrightarrow (5,-3)$

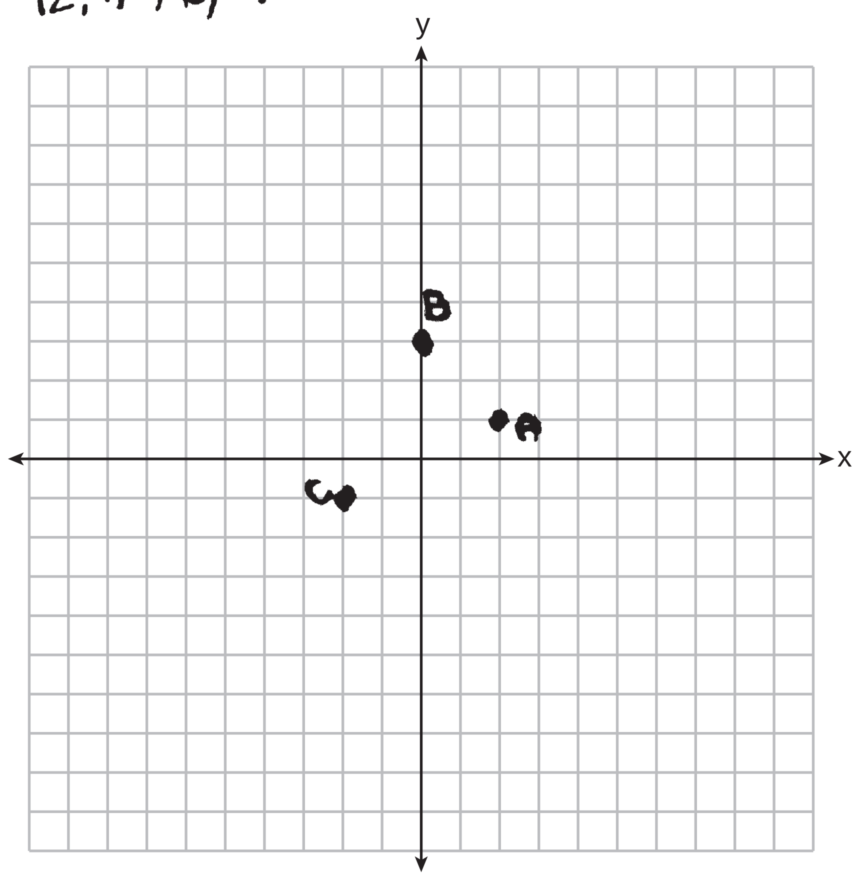
$(0,3) \longrightarrow (0,-3) \longrightarrow (3,-5)$

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

$\boxed{\begin{matrix}(5,-3)\\(3,-5)\\(3,-1)\end{matrix}}$

3 right 2 down

$(2,-1) \rightarrow (5,-3)$



Score 1: The student translated one point incorrectly.

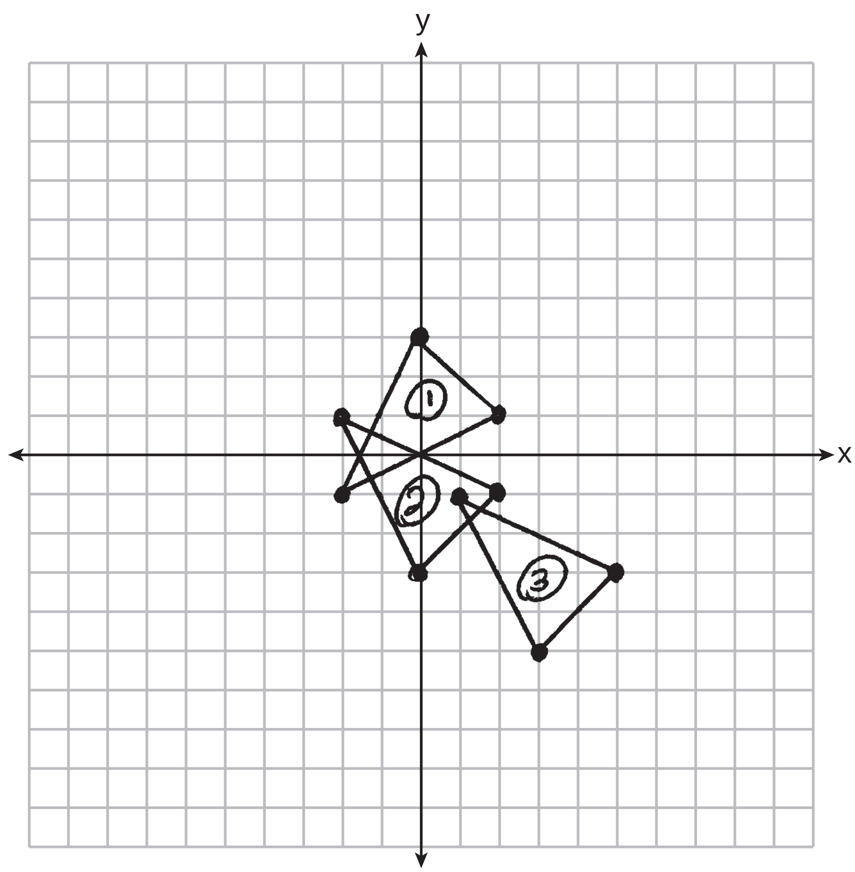
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the x-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

$\Delta 3$



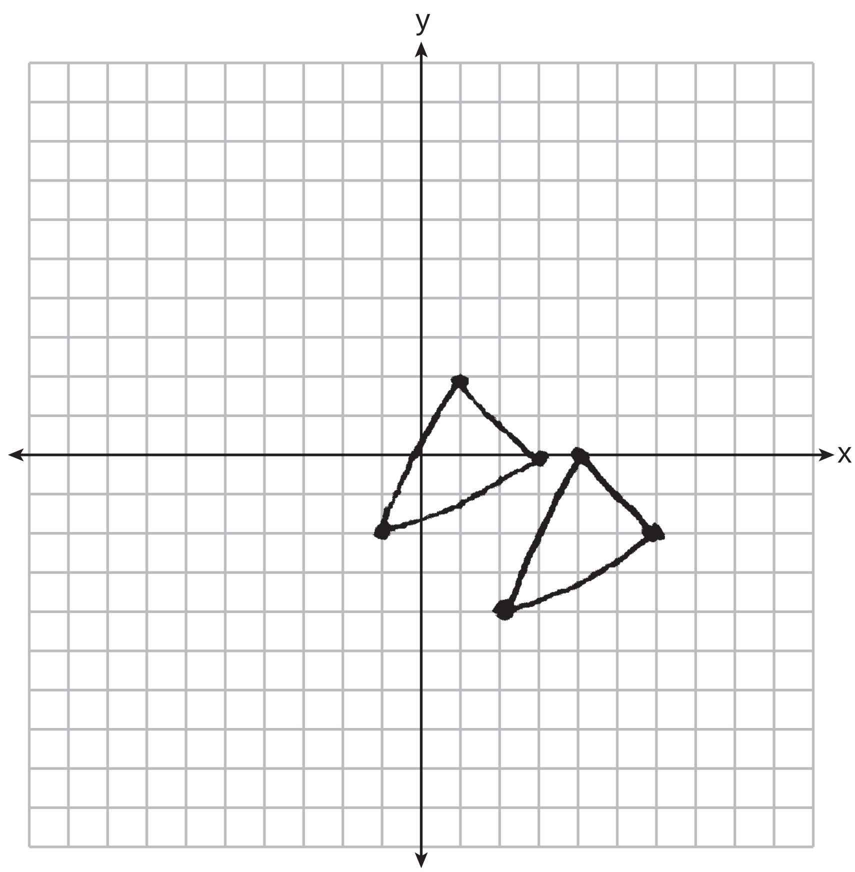
Score 1: The student correctly graphed the image of the triangle, but did not state the coordinates of the vertices.

Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]



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

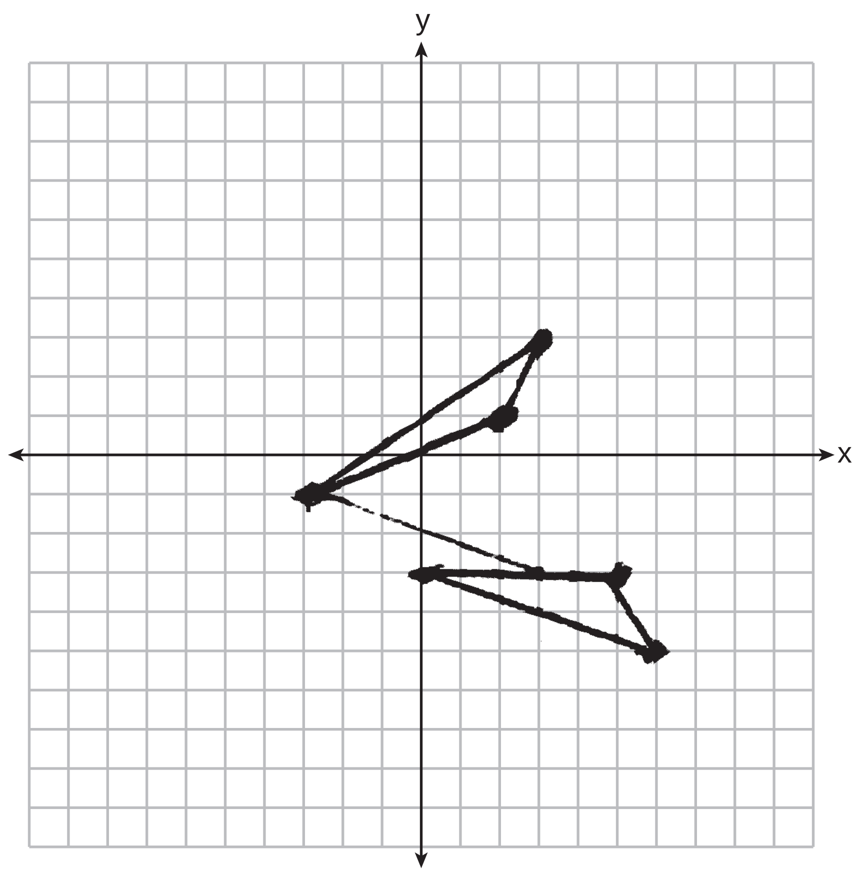
Question 25

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the x-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

(-3,0), (5, -3), (6, -5)



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

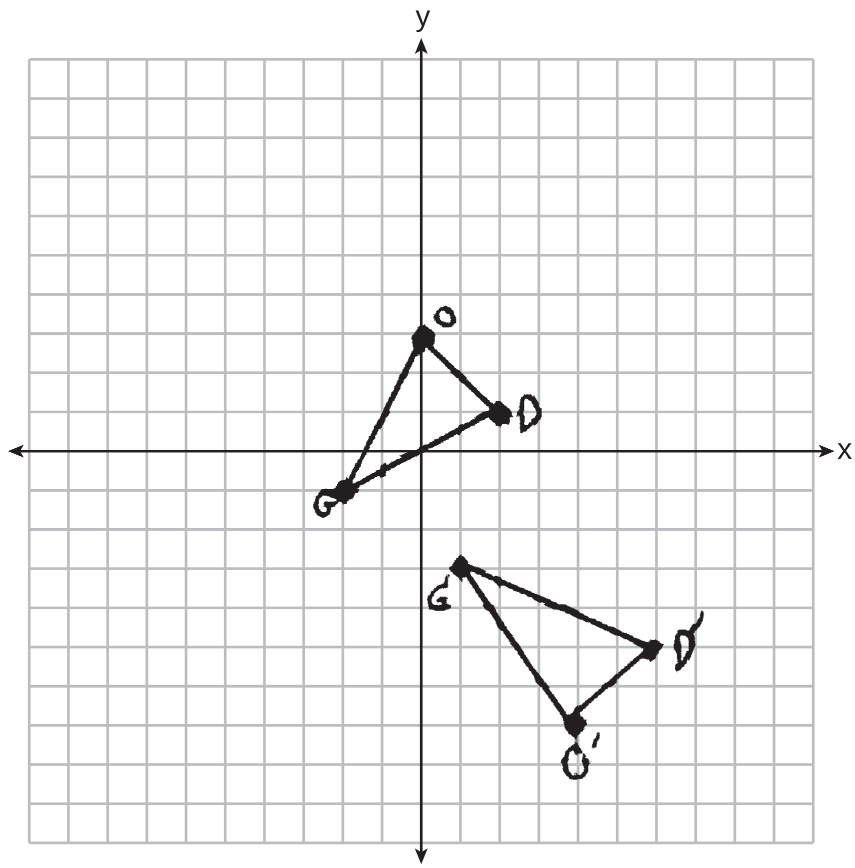
Question 25

D O G

25 A triangle has vertices with coordinates (2, 1), (0, 3), and (−2, −1).

Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[The use of the set of axes below is optional.]

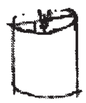


Score 0: The student did not show enough correct relevant work to receive any credit.

Question 26

26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.


15

$A = \pi r^2$ $\quad A = \pi 5^2 \quad \frac{10}{2} = 5$

$A = 78.53\ldots$ area of circle

$V = Bh$

$V = 78.53(15)$

$V = 1178.0972\ldots$ volume of bucket

$1178.0972\ldots(0.0231) = 27.21$

27 pounds

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

Question 26

26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.

V of = $\pi \cdot Bh$

$V = \pi 5^2 \times 15$

$V = 1178.097245$

$\frac{0.0231}{1} = \frac{x}{1178.097245}$

$x = 27.21$

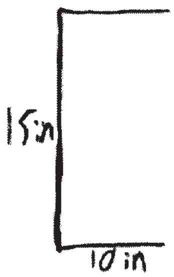
Weight: 27 pounds

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

Question 26

26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.



$V = Bh$

$10^2 \cdot \pi = 314.1593$

$314.1593 \cdot 15 = 4712.379$

$4712.389 \cdot 0.0231 = 108.8562$

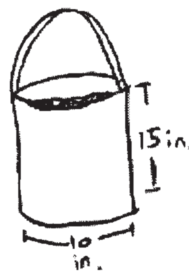
$W = 109$ LBs when full

Score 1: The student made an error in using 10 for the radius.

Question 26

26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.



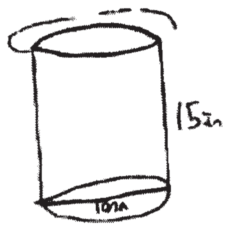
$V = \pi 5^2 \cdot 15$
$V = 1178.097245$

Score 1: The student correctly determined the volume of the cylinder.

Question 26

26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.



$V = 1178 in^3$

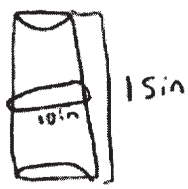
W = 27 lbs.

Score 1: The student determined the correct weight, but did not show work.

Question 26

26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.



$V = Bh$

$V = 150 \cdot 15$

$V = 2250\text{in}$

$\dfrac{0.0231\text{lbs}}{1} = \dfrac{?}{2250\text{in}}$

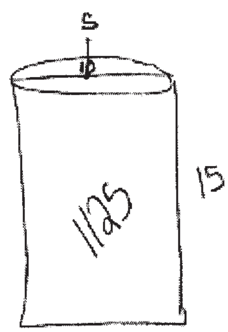
Score 0: The student did not show enough correct work to receive any credit.

Question 26

$V = Bh$

26 A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.



$V = 150(15)$

$V = 2250$

$2250 \div 0.0231$

$= 97402.5974$

$\boxed{= 97403}$

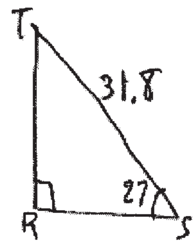
$\boxed{97403 \text{ pounds}}$

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

Question 27

27 In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$.

Determine and state the length of $\overline{SR}$, to the *nearest tenth*.



$\cos 27 = \frac{x}{31.8}$

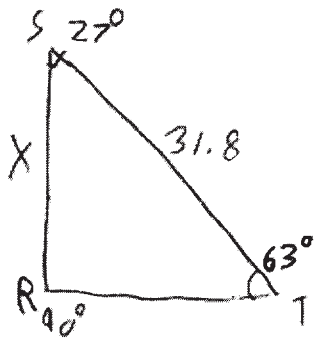
$\underline{SR = 28.3}$

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

Question 27

27 In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$.

Determine and state the length of $\overline{SR}$, to the *nearest tenth*.



$90 + 27 = 117$

$180 - 117$

63

$\sin(63) = \frac{x}{31.8} \cdot 31.8$

$\cdot 31.8$

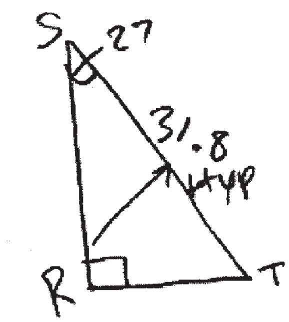
$28.3 = x$

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

Question 27

27 In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$.

Determine and state the length of $\overline{SR}$, to the *nearest tenth*.



SohcahToa

$\sin 27 = \frac{x}{31.8}$

$31.8 \sin 27 = x$

$x = 14.43\ldots$

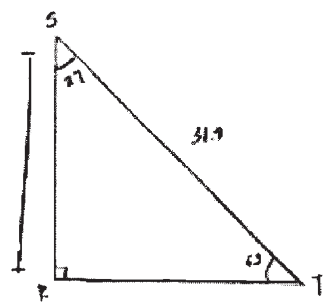
$= 14.4$

Score 1: The student used an incorrect trigonometric equation, but found an appropriate answer.

Question 27

27 In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$.

Determine and state the length of $\overline{SR}$, to the *nearest tenth*.



SOHCAHTOA

$31.8 \times \tan(63) = \frac{SR}{31.8} \times 31.8$

$SR \approx 62.411$

$SR = 62.4$

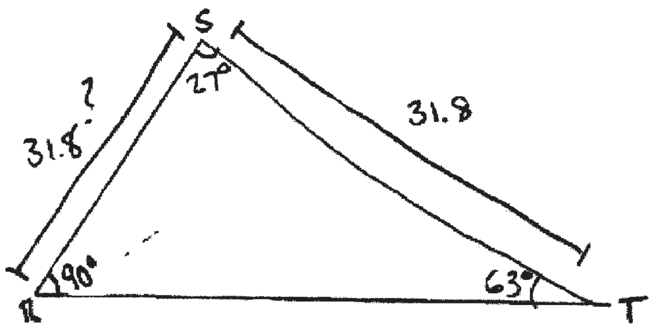
Score 1: The student used an incorrect trigonometric equation, but found an appropriate answer.

Question 27

27 In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$.

Determine and state the length of $\overline{SR}$, to the *nearest tenth*.

$90° + 27° = 117°$
$180° - 117° = 63°$



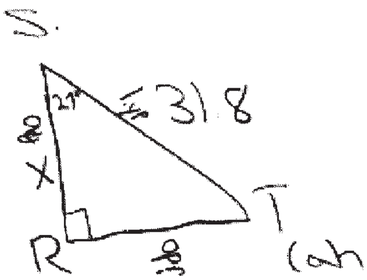
$X = 31.8$

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

Question 27

27 In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$.

Determine and state the length of $\overline{SR}$, to the *nearest tenth*.



cah soh

$\cancel{\sin(27) = \frac{x}{31.8}}$

$x = SR$

$x = 30.4$

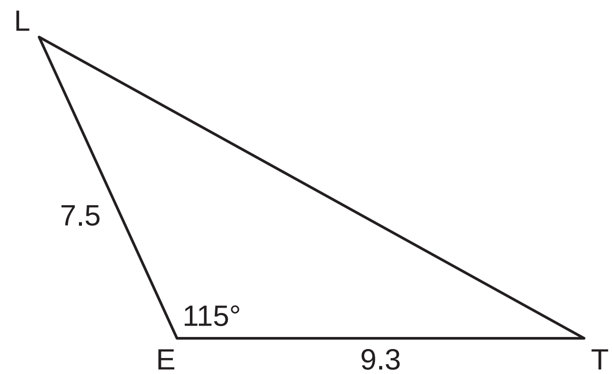
$x = 30.412$

$x = 30.4$

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

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

$A = \frac{1}{2}(7.5)(9.3)(\sin(115))$

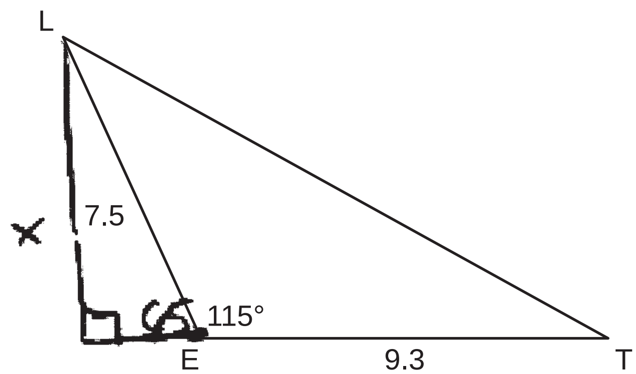
$A = 31.60748407\ldots$

$\boxed{A \approx 31.6}$

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

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

$$\begin{array}{r} 180 \\ -\,115 \\ \hline 65 \end{array}$$

$$\frac{\sin(65)}{1} = \frac{x}{7.5}$$

$$x = 6.797308403$$

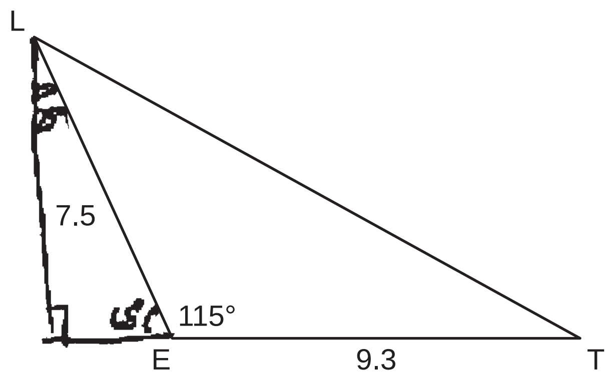
$$A = \frac{1}{2}(6.797308403)(9.3)$$

Area of ΔLET = 31.6

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

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

$\sin(25) = 0.4226182617$

$\frac{opp.}{7.5} = $

$opp = \times 7.5$

$opp_1 = 3.169636963$

$\sin(65) = 0.906307787$

$\frac{opp.}{7.5} = $

$opp = \times 7.5$

$opp_2 = 6.797308403$

$\frac{bh}{2}$

$b: 9.3 + 3.169636963$

$b = 12.46963696$

$\frac{\square \times 6.797308403}{2} = \frac{84.75996811}{2}$

$42.37998406 =$

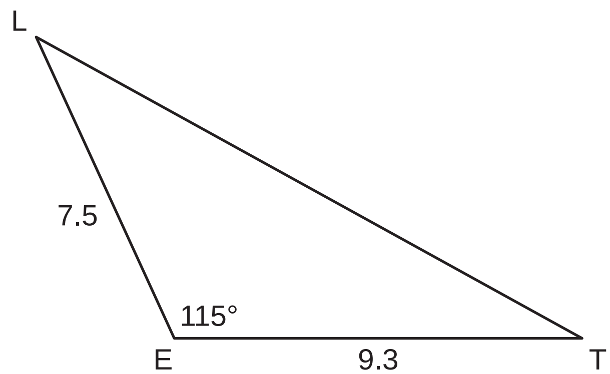
$\frac{opp_1 \cdot opp_2}{2} = \frac{21.5449996}{2} = 10.7724998$

$42.37998406 - 10.77249998 = 31.6074840 \approx 31.6$

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

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



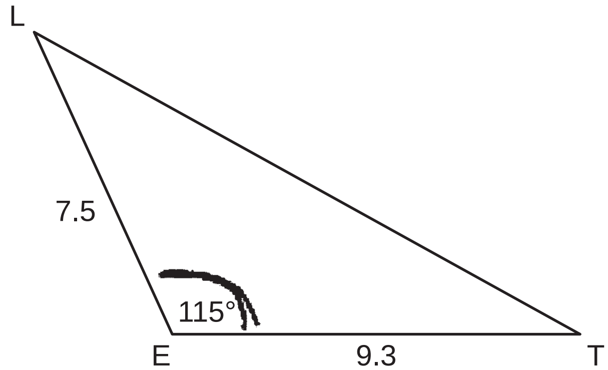
Determine and state the area of $\triangle LET$, to the *nearest tenth*.

$\sin(115)\ (7.5)(9.3) = 63.2$

Score 1: The student used an incorrect formula, but found an appropriate answer.

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



Determine and state the area of $\triangle LET$, to the ~~nearest tenth~~.

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

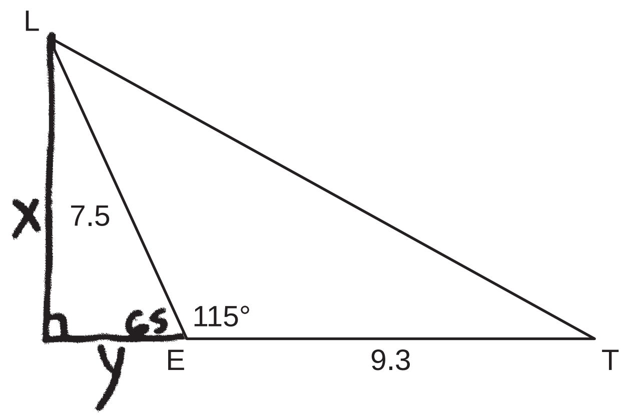
$\frac{(7.5 \times 9.3)}{2} = 34.875 \approx \boxed{34.9}$

$\therefore$ The area of the triangle LET is approximately 34.9 square units

Score 1: The student made a conceptual error using 7.5 as the height of the triangle.

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

$$\frac{\sin 65}{1} = \frac{x}{7.5}$$

$$x = 6.797$$

$$\frac{\cos 65}{1} = \frac{y}{7.5}$$

$$y = 3.1696$$

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

$$A = \frac{1}{2}(6.7973)(9.3 + 3.1696)$$

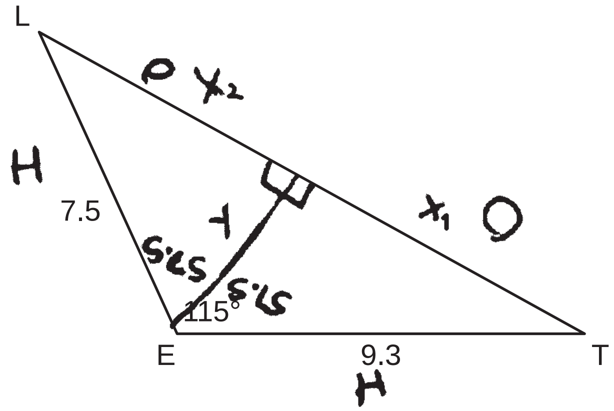
$$A = 42.3798$$

$$\boxed{A = 42.4}$$

Score 1: The student made an error in using an incorrect base length when finding the area of the triangle.

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

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

$\sin 57.5 = \frac{x_1}{9.3}$

$\cos 57.5 = \frac{Y}{9.3}$ $\quad A =$

$x_1 = 9.3 \sin 57.5$

$Y = 4.9968860358$

$x_1 = 7.843540446$

$A = \frac{1}{2}(14.16897629) \cdot 4.9968860358$

$\sin 57.5 = \frac{x_2}{7.5}$

$x_2 = 7.5 \sin 57.5$

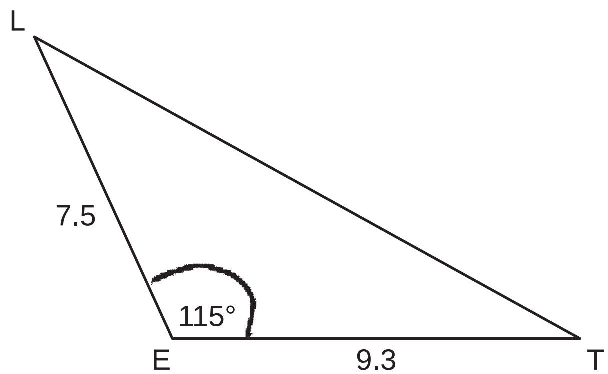
$x_2 = 6.32543844$

$\boxed{\text{Area} = 35.4}$

Score 1: The student made a conceptual error in reasoning the altitude was an angle bisector.

Question 28

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

$\tan\theta = \frac{opp}{adj}$

SOHCAH TOA

$\cancel{\tan 115 = \frac{9.3}{7.5}}$

$\cancel{x}$

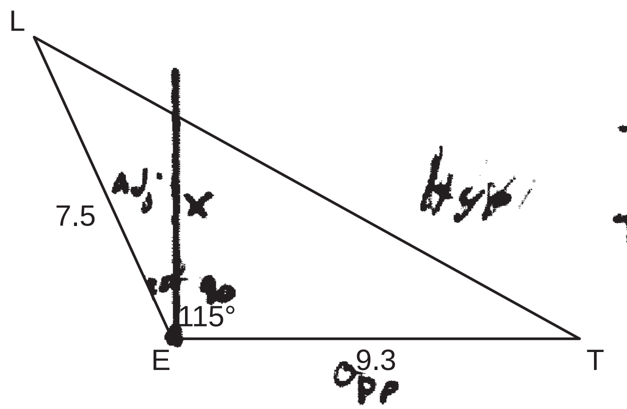
$\frac{9.3x}{9.3} = \frac{7.5(\tan 115)}{9.3}$

$x = -1.7294410\ldots$

$\triangle LET$
-1.7

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

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



$S\frac{o}{h}$ $C\frac{a}{h}$ $T\frac{o}{a}$

$\tan 90 = \frac{9.3}{x}(x)$

$\frac{\tan 90\, x}{\tan 90} = \frac{9.3}{\tan 90}$

$x = 5.80625047$

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

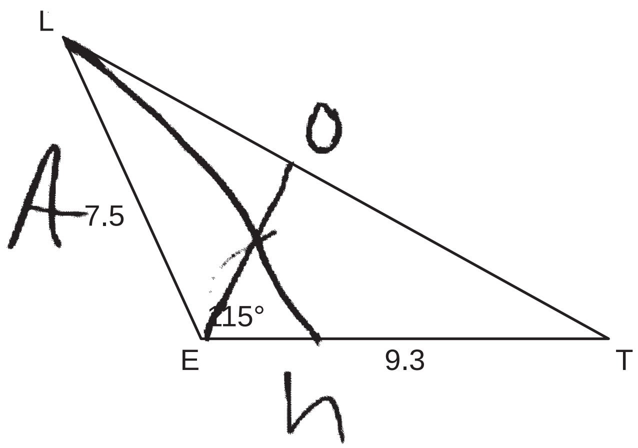
$A = \frac{1}{2}bh$

$A = \frac{1}{2}(9.3)(5.80625047)$

$A = 27.43\ldots \approx \boxed{27.4}$

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

28 In $\triangle LET$ below, $LE = 7.5$, $ET = 9.3$, and $m\angle LET = 115°$.



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

$9.3 \cdot 7.5 = 69.75$

~~$\frac{\sin 115}{1} = \frac{9.32}{x}$~~

$x = 18.5899993$

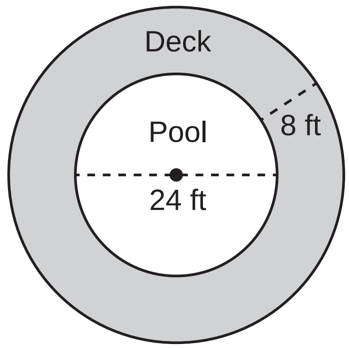
$115 \sin(9.3)$

$\boxed{A = 172.8}$

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

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



$$\begin{array}{r} 24 \\ +16 \\ \hline 40 \end{array} = \text{diameter}$$

$20 = r$

Determine and state the number of square feet of the deck, to the *nearest square foot*.

$A = 20^2 \pi$

$A = 400\pi$

$A = 1256.63706 \text{ ft}^2$

$A = 12^2 \pi$

$A = 144\pi$

452.38934 ft^2

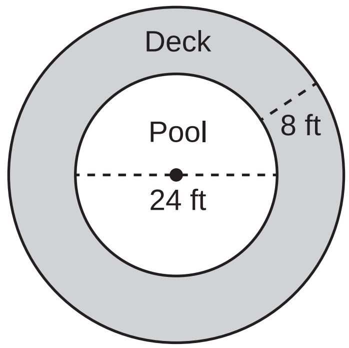
$$\begin{array}{r} 1256.637 \\ -\ 452.389 \\ \hline \end{array} = 804.24772 \text{ ft}^2$$

804 ft^2

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

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

Area of Pool: $\pi 12^2$

$144\pi \text{ ft}^2$

≈ 452.389

$\pi 20^2$: Area of Pool with Deck

$\pi 400$

≈ 1256.637

$$\begin{array}{r} 1256.637 \\ -\ 452.389 \\ \hline \approx 804.248 \end{array}$$

Area of Deck:

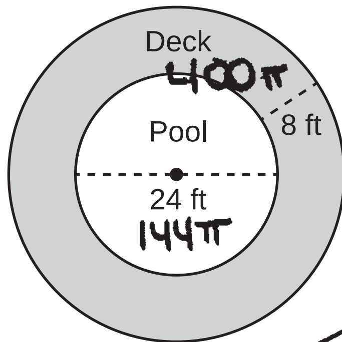
804

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

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.

$A = \pi 12^2$

$A = \pi 144$



$A = \pi 20^2$

$A = 400\pi$

deck $= 256\pi$

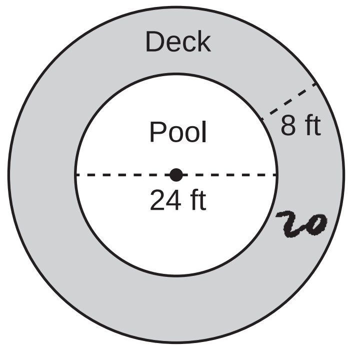
Determine and state the number of square feet of the deck, to the *nearest square foot*.

804 ft^2

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

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

$\pi\, 12^2$

$144\pi = \text{POOL}$

Deck

$\pi\, 20^2$

400π

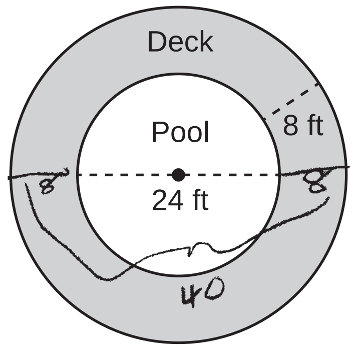
$400\pi - 144\pi = 256\pi$

804 ft

Score 1: The student labeled the answer in feet, not square feet.

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

$A = \pi r^2$
$= \pi 24^2$
$= 1809.557368$

$A = \pi r^2$
$= \pi 40^2$
$= 5026.548246$

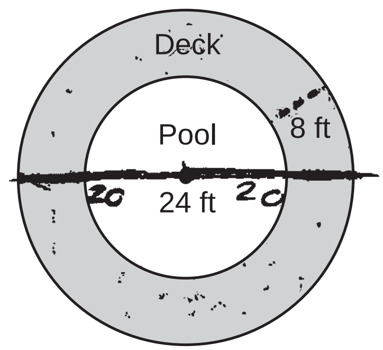
Deck $= 3216.990878$

$= \boxed{3217 \text{ ft}^2}$

Score 1: The student made an error using the diameters to determine the area of both circles.

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

$\pi(r)^2$

$\pi(20)^2$

$\pi 400$

$(12)^2\pi$

$\pi 144$

$$\begin{array}{r} 400 \\ -144 \\ \hline 256 \end{array}$$

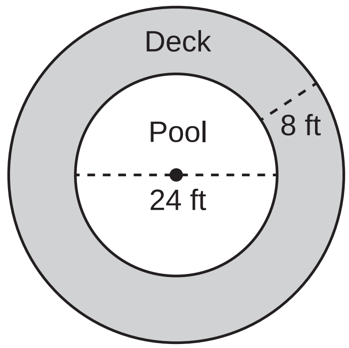
~~256cm~~

$\boxed{256\pi}$

Score 1: The student left the answer in terms of π.

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

$24 - 8 = 16$

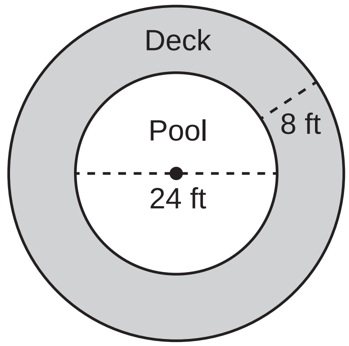
$A = \pi 16^2$

$A = 804.248$

$\boxed{A = 804}$

Score 0: The student determined a correct answer using an obviously incorrect procedure.

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

$C = \pi 40 = 125.663 \quad 126$

$C = \pi 24 = 75.398 \quad 75$

$C = \pi 16 = 50.265 \cdot 8 = 402.123$

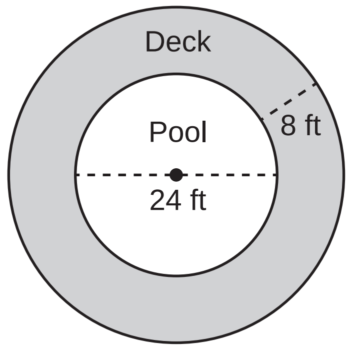
$\downarrow$

402 ft^2

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

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

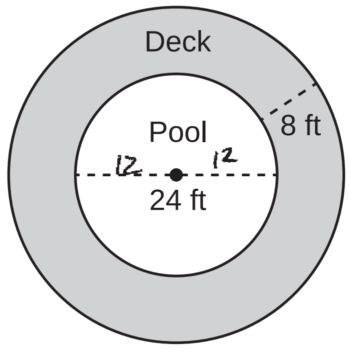
$\pi\, 12^2 \approx 452$

$452/3 = 151\text{ft}^2$

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

Question 29

29 A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram below. The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.



Determine and state the number of square feet of the deck, to the *nearest square foot*.

$A = \pi r^2$

$= \pi 12^2$

$= 144\pi$

$A = 452.3893$

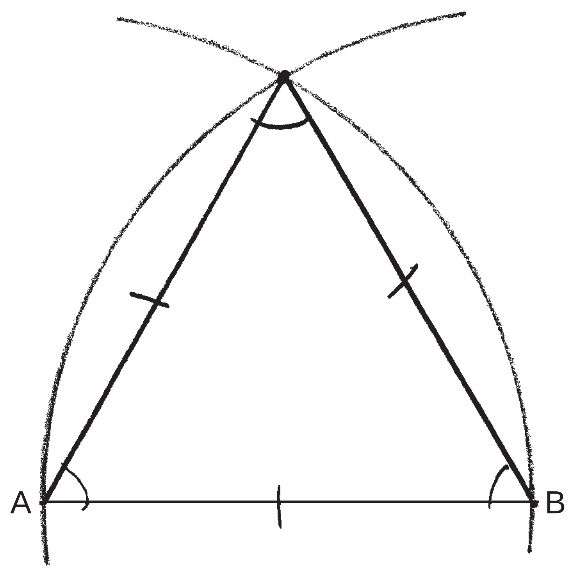
$\boxed{A = 452\ ft^2}$

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

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

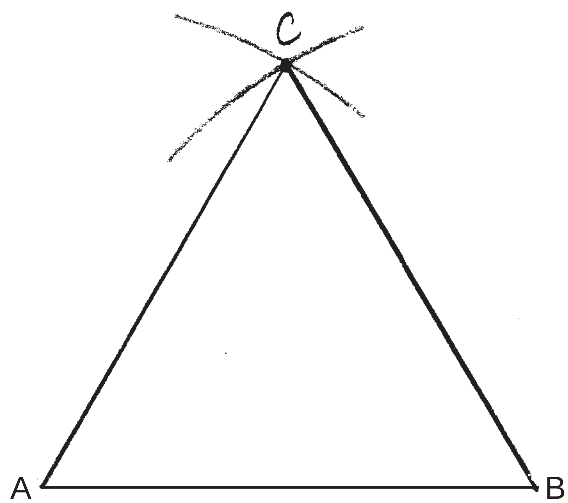


Score 2: The student gave a complete and correct response.

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

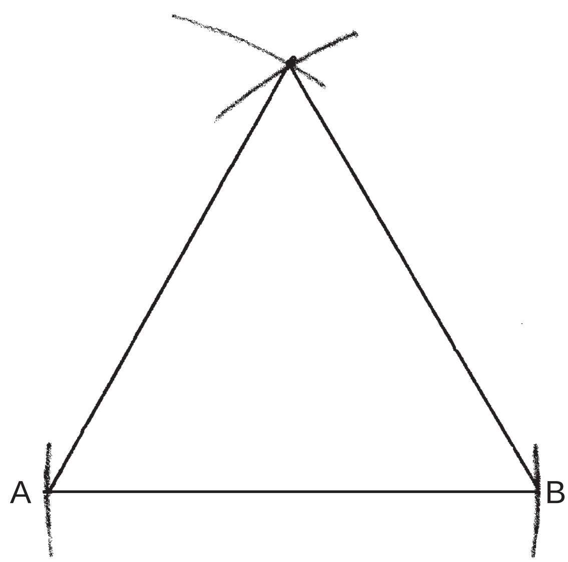


Score 2: The student gave a complete and correct response.

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

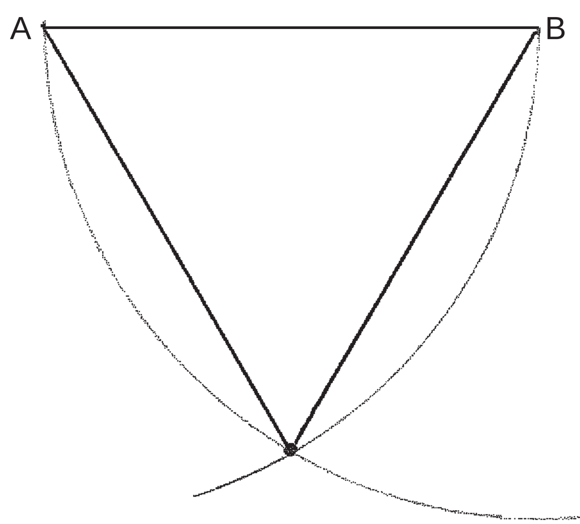


Score 2: The student gave a complete and correct response.

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

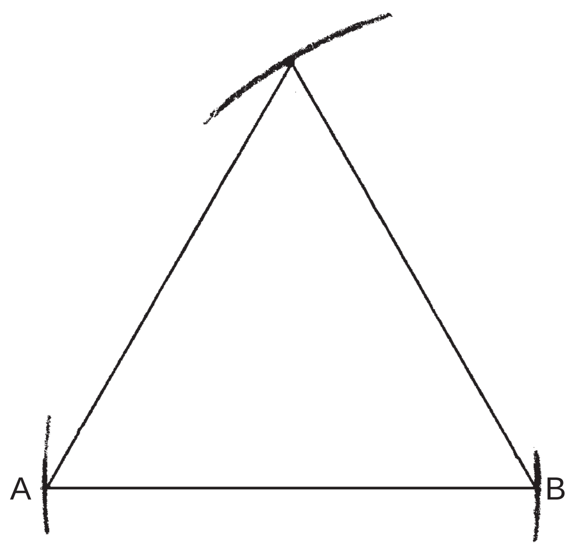


Score 2: The student gave a complete and correct response.

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

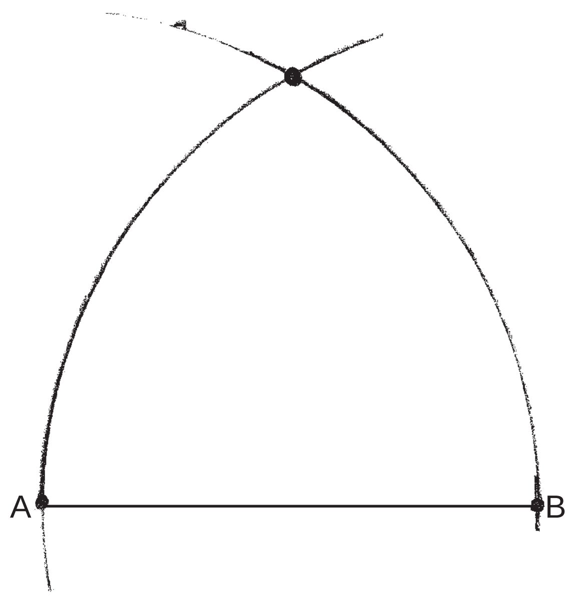


Score 1: The student was missing one construction arc at the third vertex of the triangle.

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

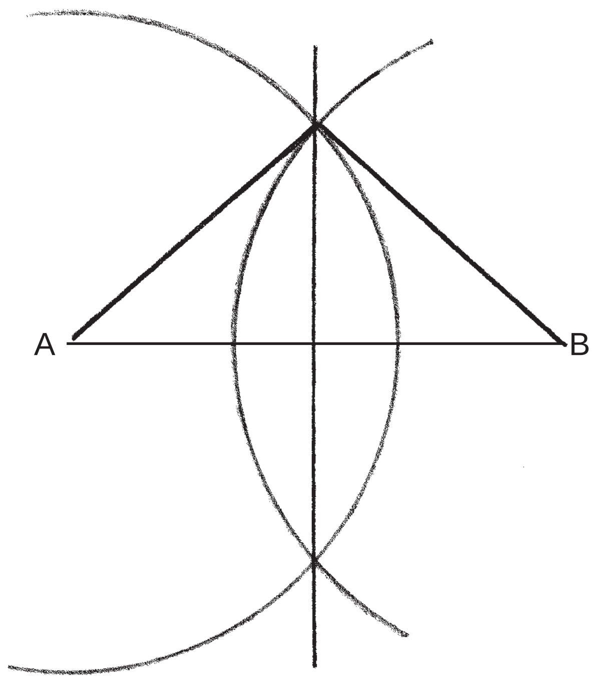


Score 1: The student constructed all appropriate arcs, but did not draw the triangle.

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

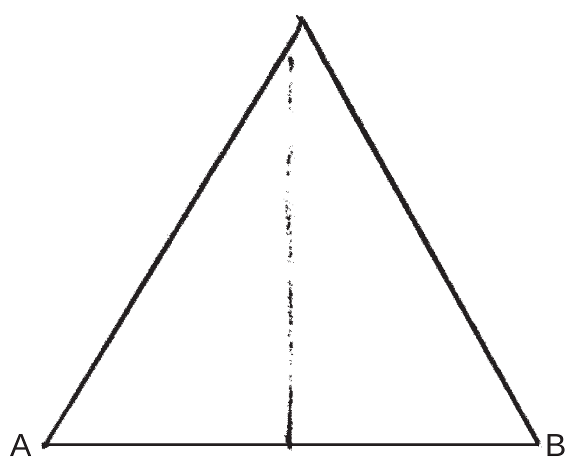


Score 0: The student did not show enough correct relevant work to receive any credit.

Question 30

30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]

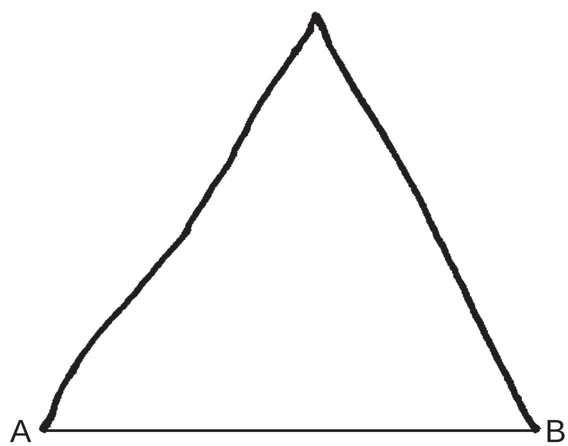


Score 0: The student made a drawing that was not an appropriate construction.

Question 30

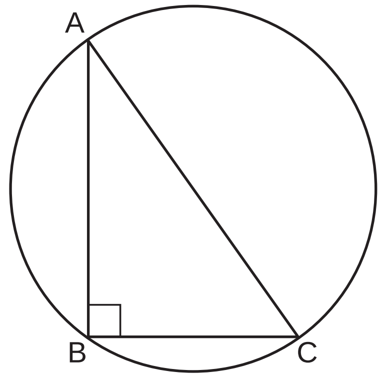
30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[Leave all construction marks.]



Score 0: The student made a drawing that was not an appropriate construction.

31 In the diagram below, right triangle ABC is inscribed in the circle with right angle ABC.



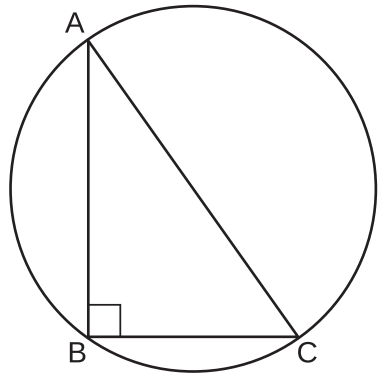
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ is a diameter because $\measuredangle ABC$ is an inscribed angle and it is 90°. That means that the arc that the $\measuredangle$ opens up to is x2 the amount of the $\measuredangle$ 90 x 2 = 180 A circle is 360° 180 is half of 360 which shows it is split in half by a diameter because a diameter splits a circle in half.

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

Question 31

31 In the diagram below, right triangle *ABC* is inscribed in the circle with right angle *ABC*.



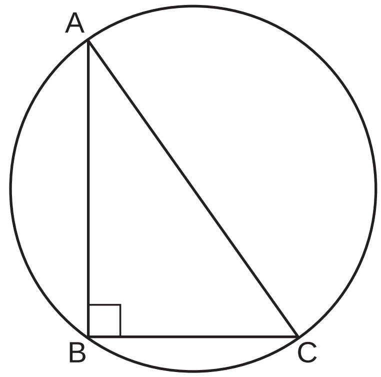
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ must be a diameter because in order for $\angle B$ to be a right angle that is touching the edge of the circle, $\overparen{AC}$ has to be 180°. In order for $\overparen{AC}$ to be 180°, $\overline{AC}$ has to split the circle perfectly in half and that makes it a diameter.

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

Question 31

31 In the diagram below, right triangle ABC is inscribed in the circle with right angle ABC.



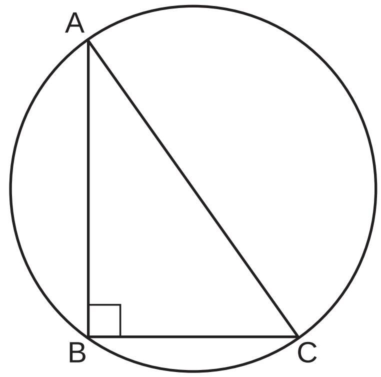
Explain why $\overline{AC}$ must be a diameter of the circle.

∡B is a 90° ∡ which means that the arc it opens up to $\overset{\frown}{AC}$ is 2x the ∡ so $\overset{\frown}{AC}$ is 180 and 180 is half 360 (half a circle) and a diameter cuts the circle in half.

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

Question 31

31 In the diagram below, right triangle *ABC* is inscribed in the circle with right angle *ABC*.



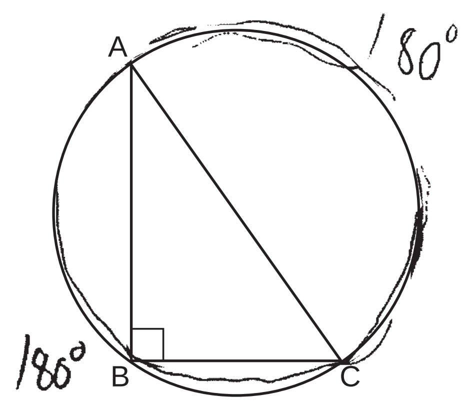
Explain why $\overline{AC}$ must be a diameter of the circle.

An inscribed right triangle is formed when the hypotenuse is the diameter of the triangle. $\overline{AC}$ is the hypotenuse of right triangle ABC, therefore $\overline{AC}$ is the diameter of the circle.

Score 1: The student wrote a partially correct explanation.

Question 31

31 In the diagram below, right triangle ABC is inscribed in the circle with right angle ABC.



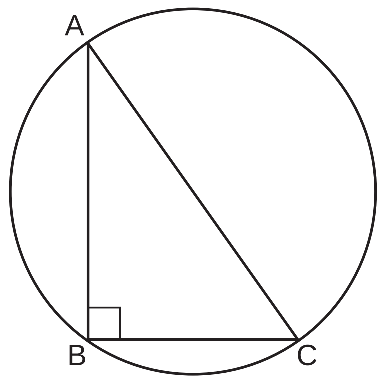
Explain why $\overline{AC}$ must be a diameter of the circle.

Since ∡ABC is 90° and has its vertex on the edge of the circle, $\widehat{AC}$ is 180° since the angle is $\frac{1}{2}$ the number of degrees in the arc. Finally, since there is 360° in a circle, and $\overline{AC}$ splits the circle into 2 congruent hemispheres with 180° as both of their arcs, $\overline{AC}$ must be the diameter of the circle.

Score 1: The student wrote a partially correct explanation by referring to the semicircles as hemispheres.

Question 31

31 In the diagram below, right triangle *ABC* is inscribed in the circle with right angle *ABC*.



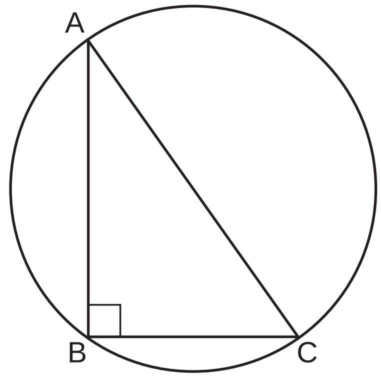
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ must be a diameter of the circle because right triangles are only inscribed in a circle if one side of it is the diameter of the circle.

Score 1: The student wrote a partially correct explanation.

Question 31

31 In the diagram below, right triangle *ABC* is inscribed in the circle with right angle *ABC*.



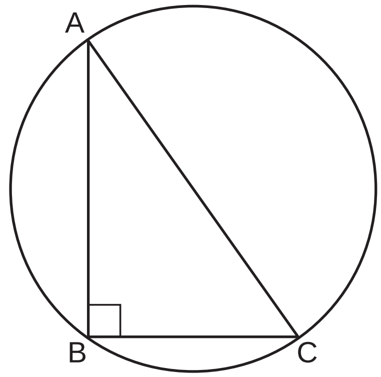
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ must be a diameter of the circle because it cuts the circle in half and $\overline{AC}$ goes from one end of the circle to another, measuring the distance within the circle, which ends up being the diameter.

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

Question 31

31 In the diagram below, right triangle *ABC* is inscribed in the circle with right angle *ABC*.



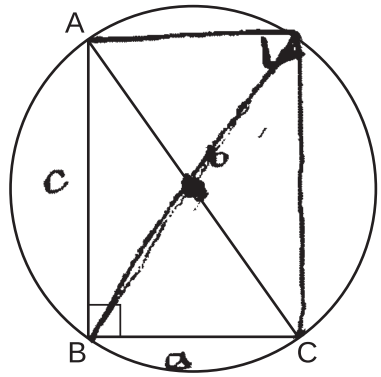
Explain why $\overline{AC}$ must be a diameter of the circle.

If it's a right triangle it adds up to 180°
the hypotenus ($\overline{AC}$) is the diamenter because
it's splits the circle in half

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

Question 31

31 In the diagram below, right triangle ABC is inscribed in the circle with right angle ABC.



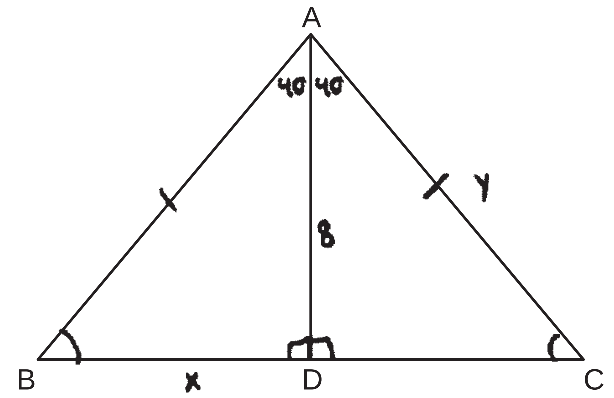
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ must be the diameter because the chords form a right triangle meaning that if you duplicated the triangle, a perfect △ would be around the whole shape. The midpoint of the hypotenuse would be the center of the circle. This results in a diameter because $\overline{AC}$ touches both sides of the circle and goes through the center point.

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

Question 32

32 In isosceles triangle *ABC* below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\tan 40 = \frac{x}{8}$

$x = 6.712797$

$* \ 2$

13.43

$\cos 40 = \frac{8}{y}$

$y = 10.443258$

$* \ 2$

20.89

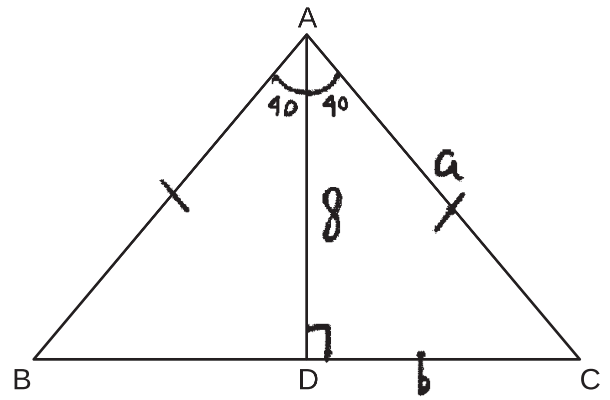
$+$

34.3

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$$\cos(CAD) = \frac{8}{a} \qquad 8^2 + b^2 = \left(\frac{8}{\cos 40}\right)^2$$

$$\cos(40) = \frac{8}{a} \qquad 64 + b^2 = 109.1$$

$$\frac{\cos(40)}{8} = \frac{1}{a} \qquad b^2 = 45.1$$

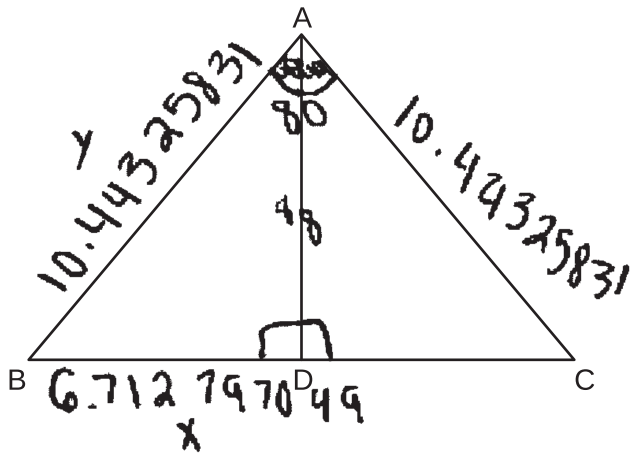
$$\frac{8}{\cos(40)} = a \qquad b = \sqrt{45.1}$$

$$\frac{8}{\cos(40)} + \frac{8}{\cos 40} + 2\sqrt{45.1} \approx 34.3$$

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\cos 40 = \frac{8}{y}$

$\tan 40 = \frac{x}{8}$

$y = \frac{8}{\cos 40}$

$x = 6.712797049$

$y = 10.44325831$

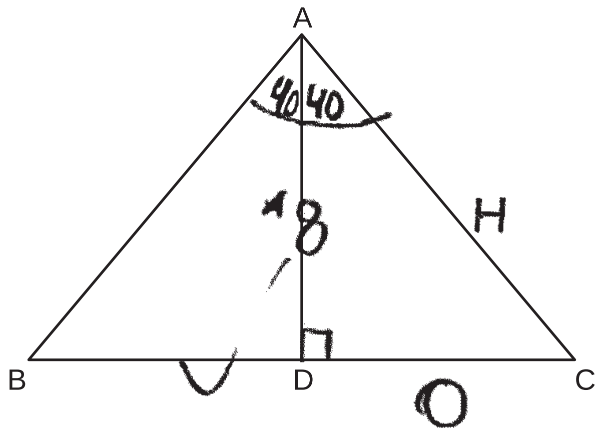
$2(6.712797049) + 2(10.44325831) =$

P of $\triangle ABC = 34.3$

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\tan(40) = \frac{O}{8}$

6.712797049

$*2$

13.4255941

$P = 34.3$

$\sin 40 = \frac{6.712797049}{H}$

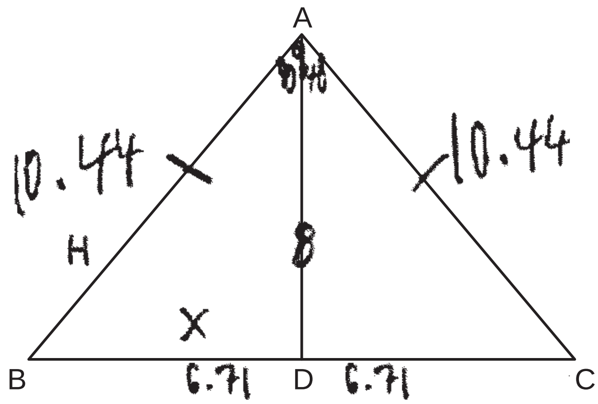
$H = 10.44325831$

$*2$

20.8865166

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

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\tan 40 = \frac{X}{8}$

$\cos 40 = \frac{8}{H}$

$X = 6.71 \approx 6.7$

$H \cos 40 = 8$

$\frac{H \cos 40}{\cos 40} = \frac{8}{\cos 40}$

$2(6.7) = $ Whole side

$H = 10.44 \approx 10.4$

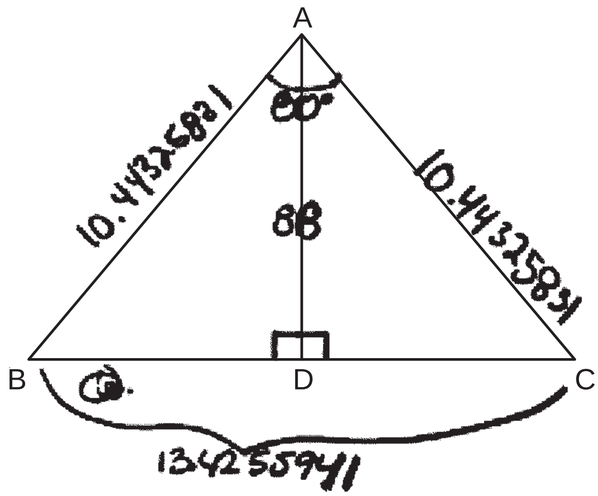
10.4
$+10.4$
13.4

$\boxed{P\text{ of }\triangle ABC = 34.2}$

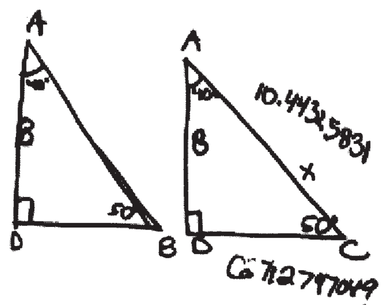
Score 3: The student made a rounding error.

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.



$180 - 130 = 50$

SOH
CAH
TOA

$Tan = \frac{8}{x}$

$x = \frac{8}{Tan}$

$Tan50 = \frac{8}{DC}$

$DC = \frac{8}{Tan50}$

$DC = 6.712797049$

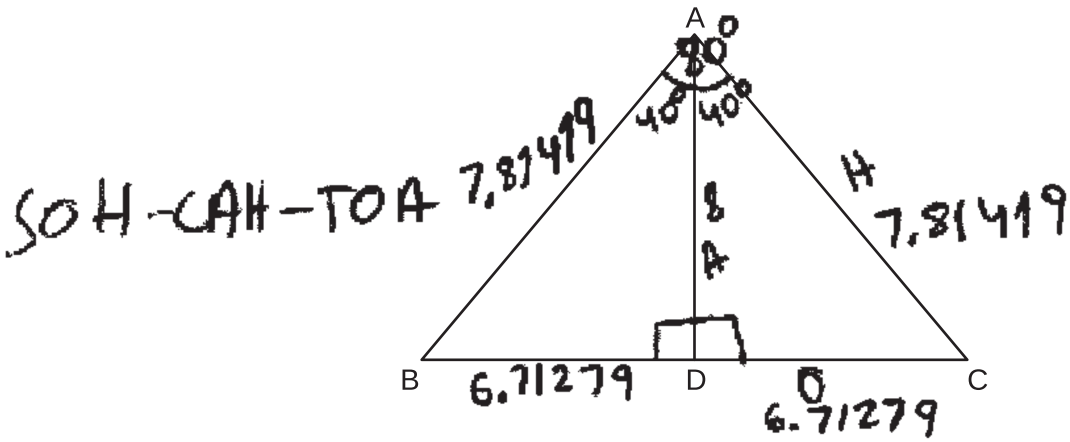
$Sin50 = \frac{8}{x}$

$x = \frac{8}{Sin50}$

$x = 10.44325831$

Score 3: The student correctly determined the length of all three sides of $\triangle ABC$.

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\frac{\tan 40}{1} = \frac{x}{8}$

$x = 6.71279$

$8^2 + 6.7127^2 = H^2$

$16 + 45.061 = H^2$

$\sqrt{61.061} = \sqrt{H^2}$

$H = 7.8141$

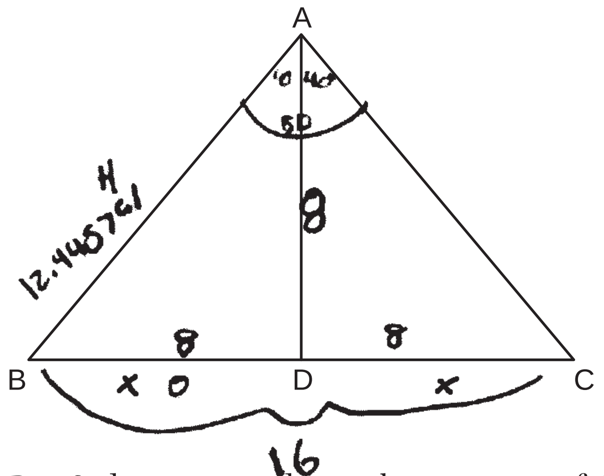
$P = 7.8141 + 7.8141 + 6.71279 + 6.71279$

$P = 29.1$

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\frac{x}{8} = \frac{8}{x}$

$\sqrt{x^2} = \sqrt{64}$

$x = 8$

$\sin 40 = \frac{8}{H}$

$H = 12.445791$

$P = 12.445791 + 12.445791 + 16$

$P = 40.9$

$\boxed{\triangle ABC \text{ Perimetere is } 40.9}$

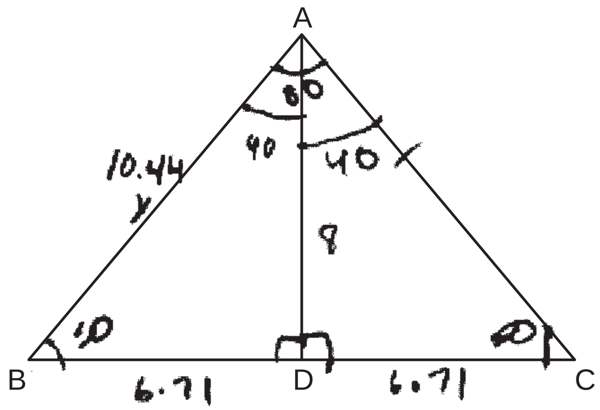
Score 2: The student made a conceptual error in using the geometric mean in a non-right triangle.

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.

SOH CAH TOA

$90 + 40 = 130$



If m$\angle BAC$ = 80° and AD = 8, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$y \cdot \sin(50) = \cancel{\frac{8}{y}}$

$\frac{y \cdot \sin(50)}{\sin 50} = \frac{8}{\sin 50}$

$y = 10.44$

$BD \cdot \tan 50 = \frac{8}{BD}$

$\frac{BD \cdot \tan 50}{\tan 50} = \frac{8}{\tan 50}$

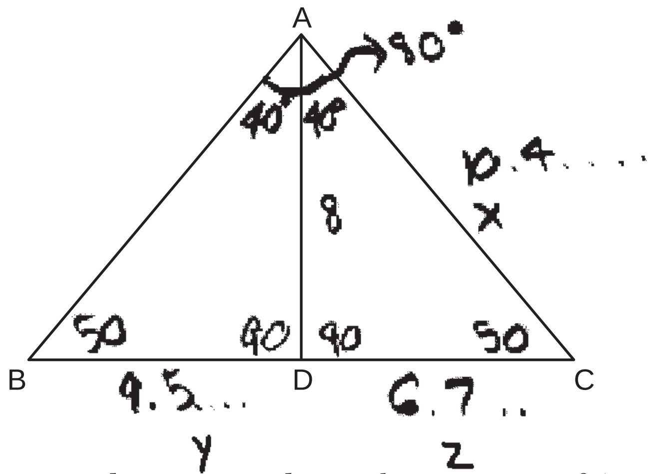
$BD = 6.71$

$P = 280.20$

Score 2: The student correctly determined the lengths of $\overline{AB}$, $\overline{BD}$, and $\overline{CD}$.

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If $m\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

Perimeter of $\triangle ABC$
19

$\frac{\sin(50)}{1} = \frac{8}{x}$

$x\sin(50) = 8$

$x = 10.44325941$

$\frac{\tan(40)}{1} = \frac{8}{y}$

$\frac{y\tan(40)}{\tan(40)} = \frac{8}{\tan(40)}$

$y = 9.53402741$

$8^2 + z^2 = 10.4^2$

$64 + z^2 = 109.062$

$-64 \qquad -64$

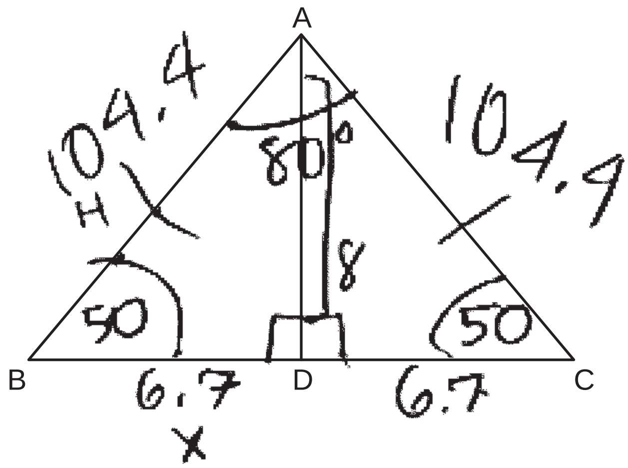
$\sqrt{z^2} = 45.06$

$z = 6.7128$

Score 2: The student correctly determined the lengths of $\overline{AC}$ and $\overline{CD}$.

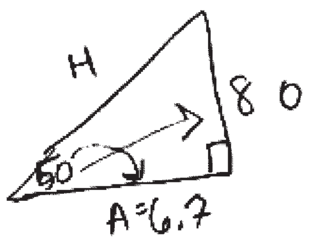
Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



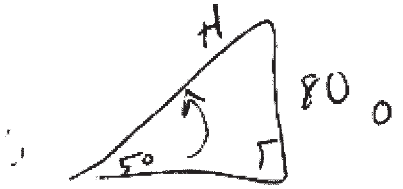
If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\frac{\tan 50°}{1} = \frac{8}{x}$



$\frac{8}{\tan 50°} = x$

$x = 6.7$



$\frac{\sin 50°}{1} = \frac{80}{H}$

$\frac{80}{\sin 50°} = H$

$H = 104.4$

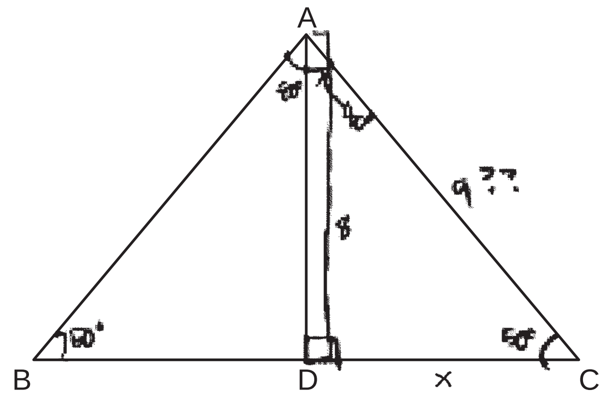
$(104.4 \times 2) + (6.7 \times 2)$

$\boxed{= 222.2}$

Score 2: The student made a transpositional error using 80 for the length of $\overline{AD}$ and made a rounding error when determining the lengths of $\overline{AB}$ and $\overline{BD}$.

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

soh cah toa

?

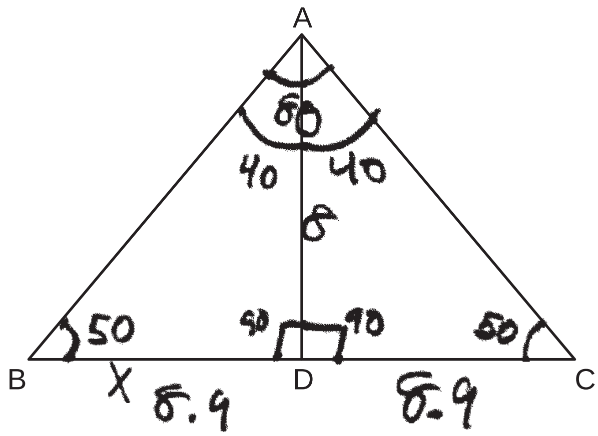
$\tan 50° = \frac{8}{x}$

$9 + 9 + 10 = \boxed{38}$

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

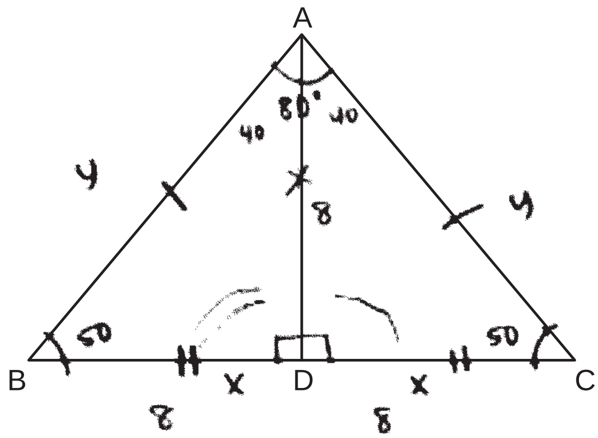
$$\frac{\tan(40)}{1} = \frac{x}{8}$$

$$x = 8.9$$

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$40+90=130$

$180-130=5$

$$\frac{x}{8} = \frac{8}{x}$$

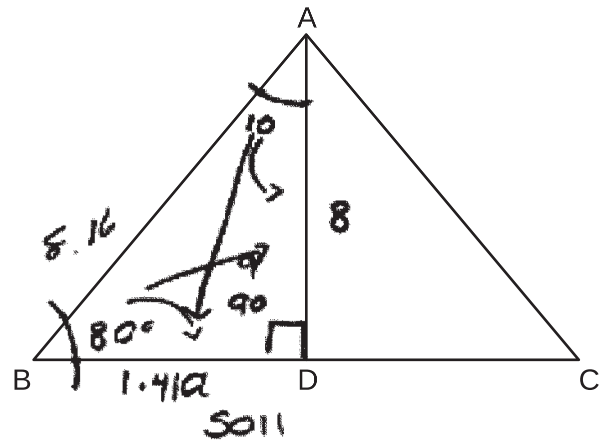
$$\sqrt{x^2} = \sqrt{64}$$

$$x=8$$

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If $m\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

SOH CAH TOA

19.07

$\frac{\text{Tan } 80°}{1} = 8/x$

$\text{Tan } 10 = \frac{x}{8}$

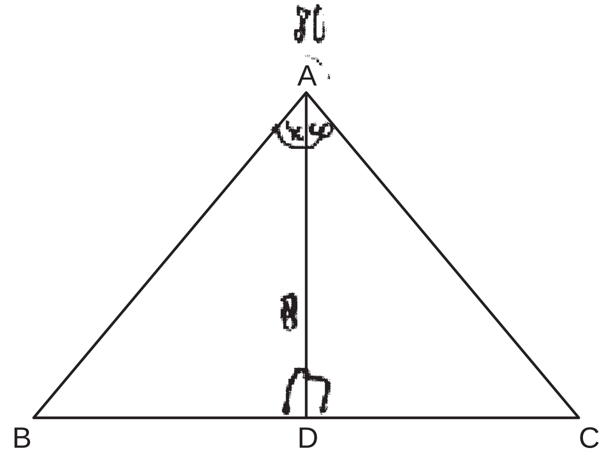
8.16 ..... + 1.4.19 (2) ......

+2 ×2

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

Question 32

32 In isosceles triangle ABC below, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.



If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

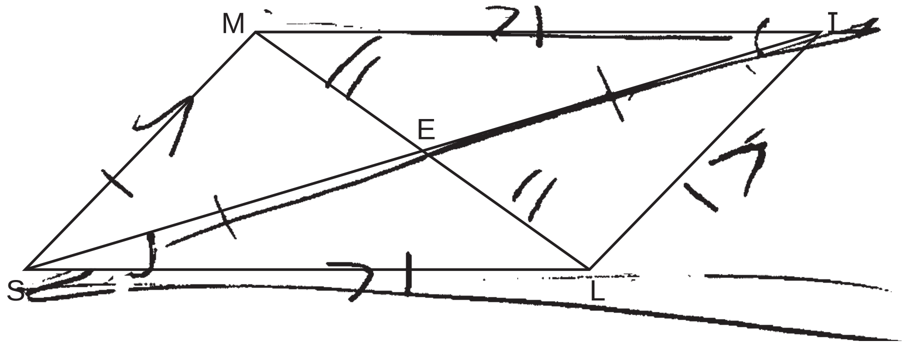
$\frac{\tan}{ }$ $\frac{x}{8}$

50.3

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



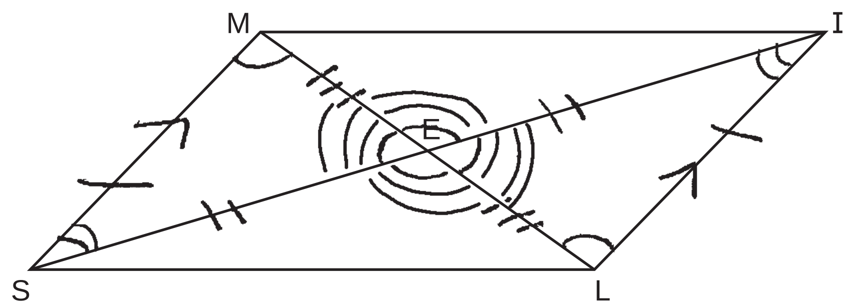
Prove: $\triangle MIE \cong \triangle LSE$

Statements	Reasons
1. quad SMIL, diagonals $\overline{IS}$ + $\overline{ML}$; $\overline{MS} \parallel \overline{IL}$; $\overline{MS} \cong \overline{IL}$	1. given
2. SMIL is a parallelogram	2. if a quad has a pair of opposite sides $\parallel$ and $\cong$ it is a parallelogram
3. $\overline{IE} \cong \overline{ES}$; $\overline{ME} \cong \overline{EL}$	3. the diagonals of a parallelogram bisect each other
4. $\overline{SL} \cong \overline{MI}$; $\overline{SL} \parallel \overline{MI}$	4 opposite sides of a parallelogram are parallel and congruent
5. $\triangle MIE \cong \triangle LSE$	5. SSS $\cong$

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



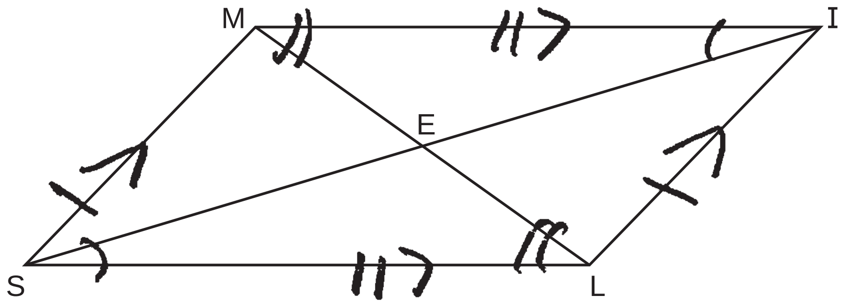
Prove: $\triangle MIE \cong \triangle LSE$

Statements	Reasons
1. quadrilateral SMIL, diagnols $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$	1. Given
2. $\angle MEI \cong \angle LES$ $\angle SEM \cong \angle LEI$	2. vertical angles are $\cong$
3. $\angle SML \cong \angle ILM$ $\angle MSE \cong \angle LIE$	3. If parallel lines, alt. interior angles are $\cong$
4. $\triangle SME \cong \triangle ILE$	4. AAS
5. $\overline{ME} \cong \overline{LE}$ and $\overline{IE} \cong \overline{SE}$	5. CPCTC
6. $\triangle MIE \cong \triangle LSE$	6. SAS

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



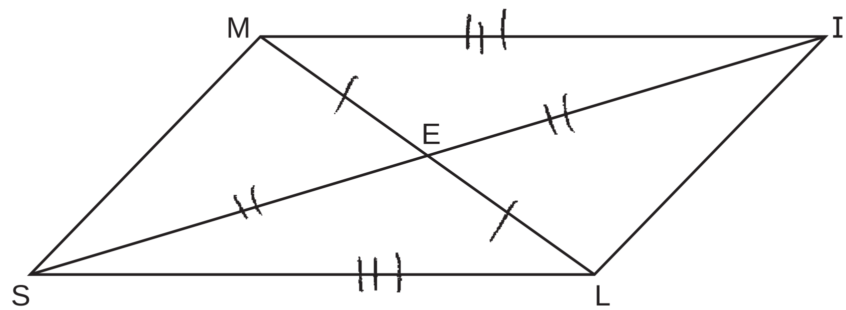
Prove: $\triangle MIE \cong \triangle LSE$

Statements	reason
1. quad. SMIL, $\overline{MS} \parallel \overline{IL}$, $\overline{MS} \cong \overline{IL}$	1. given
2. quad. SMIL is a parallelogram	2. quads. with a pair of $\cong$ and $\parallel$ opp. sides are parallelograms
3. $\overline{IM} \cong \overline{LS}$, $\overline{IM} \parallel \overline{LS}$	3. opp. sides in parallelograms are $\parallel$ and $\cong$
4. $\angle MIE \cong \angle LSE$	4. parallels cut by transversal create $\cong$ $\angle$s (alt. interior)
5. $\angle IME \cong \angle SLE$	5. parallels cut by transversal create $\cong$ $\angle$s (alt. interior)
6. $\triangle MIE \cong \triangle LSE$	6. ASA $\cong$ theorem

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



Prove: $\triangle MIE \cong \triangle LSE$

Quad SMIL, $\overline{IS}$ + $\overline{ML}$ int at E
$\overline{MS} \parallel \overline{IL}$, $\overline{MS} \cong \overline{IL}$
Given

SMIL is a ▱
If 1 pair of opp sides of a quad are ≅ + ∥, then it is a ▱.

$\overline{MI} \cong \overline{SL}$
opp sides of a ▱ are ≅

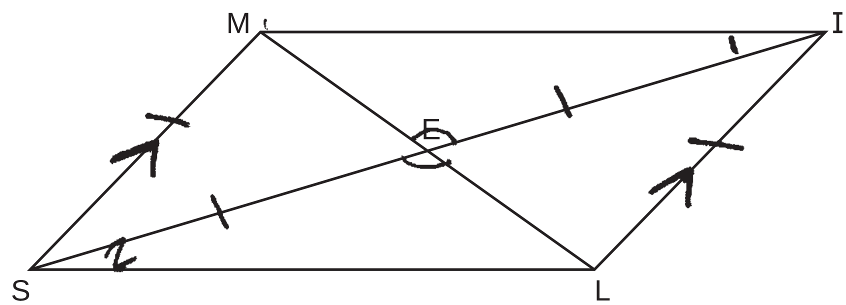
$\overline{ME} \cong \overline{EL}$
$\overline{SE} \cong \overline{IE}$
the diagonals of a ▱ bisect eachother

$\triangle MIE \cong \triangle LSE$
SSS ≅

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



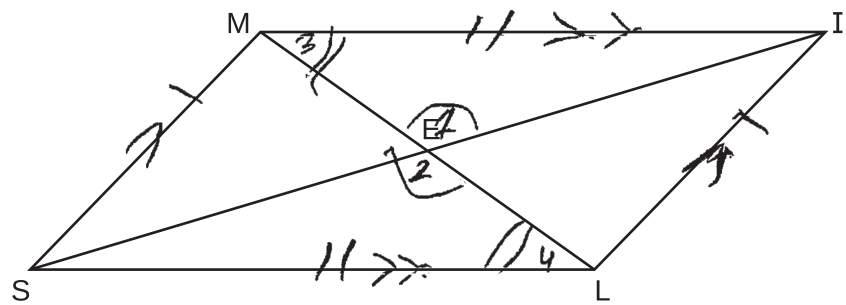
Prove: $\triangle MIE \cong \triangle LSE$

Statements	Reasons
1. Quadrilateral SMIL, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, $\overline{MS} \cong \overline{IL}$	1. Given
2. Quadrilateral SMIL is a parallelogram	2. A quadrilateral with a pair of opposite ∥ and ≅ sides is a parallelogram
3. ∡HEI and ∡SEL are vertical ∡s	3. Intersecting lines form vertical ∡s.
4. ∡MEI ≅ ∡SEL	4. Vertical ∡s are ≅.
5. ∡1 ≅ ∡2	5. In a parallelogram, opposite ∡s are ≅.
6. $\overline{IE} \cong \overline{SE}$	6. In a parallelogram, the diagonals bisect each other.
7. △MIE ≅ △LSE	7. ASA ≅ ASA

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



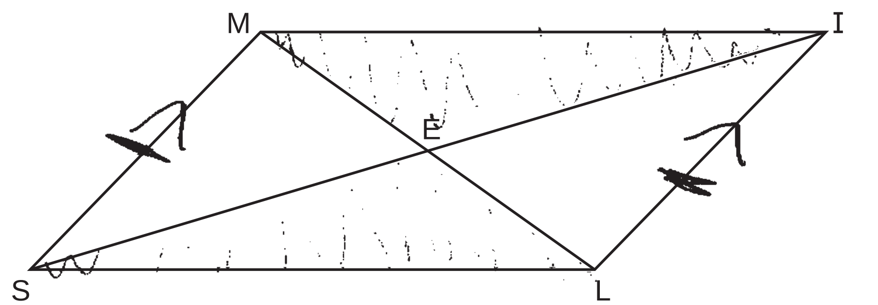
Prove: $\triangle MIE \cong \triangle LSE$

State	reason
1. quad. SMIL $\overline{IS}$ and $\overline{ML}$ intersect at pt E, $\overline{MS} \parallel \overline{IL}$ and $\overline{MS} \cong \overline{IL}$	1. Given
2. quad. SMIL is a ▱	2. a quad with 1 pair opp. sides $\parallel$ and $\cong$ is a ▱
3. $\overline{MI} \cong \overline{SL}$; $\overline{MI} \parallel \overline{SL}$	3. Opp. sides of ▱ are $\cong$
4. $\angle 1 = \angle 2$	4. vertical $\angle$'s are $\cong$
5. $\angle 3 \cong \angle 4$	5. when the lines are $\parallel$, alt. int. $\angle$'s are $\cong$
6 $\triangle MIE \cong \triangle LSE$	6. AAS $\cong$ AAS

Score 3: The student wrote an incomplete reason in step 3.

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



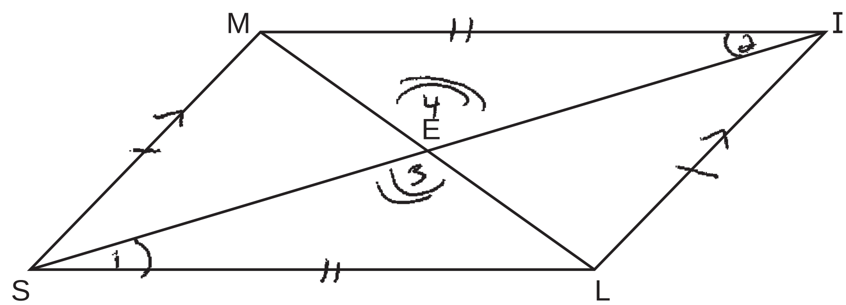
Prove: $\triangle MIE \cong \triangle LSE$

Statement	Reason
1. Quadrilateral SMIL, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E	1. Given
2. $\angle MEI \cong \angle LES$	2. Def of vertical ∠s
3. $\overline{MS} \parallel \overline{IL}$, $\overline{MS} \cong \overline{IL}$	3. Given
4. $\angle EMS \cong \angle ELI$	4. If two parallel lines are cut by a transversal, alternate interior angles are ≅
5. $\angle MSE \cong \angle LIE$	5. Same as 4
6. $\triangle EMS \cong \triangle ELI$	6. ASA Postulate (4, 3, 5)
7. $\overline{EM} \cong \overline{EL}$	7. Corresponding parts of ≅ △s are ≅
8. $\overline{ES} \cong \overline{EI}$	8. Same as 7
9. $\triangle MIE \cong \triangle LSE$	9. SAS Postulate (7, 2, 8)

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



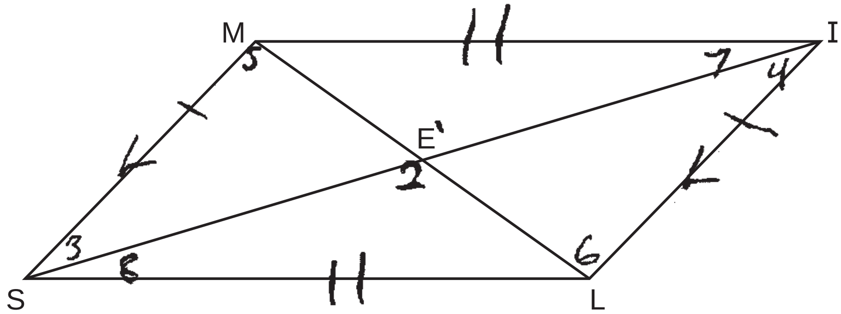
Prove: $\triangle MIE \cong \triangle LSE$

Statement	Reason
① Quad SMIL, $\overline{IS}$ & $\overline{ML}$ intersect at E, $\overline{MS} \parallel \overline{IL}$, $\overline{MS} \cong \overline{IL}$	① Given
② SMIL ▱	② If a quad has 1 pair opp sides $\cong$ and $\parallel$, then ▱
③ $\angle 1 \cong \angle 2$	③ If 2 lines $\parallel$, then Alt. Int. $\angle$'s $\cong$
④ $\angle 3 \cong \angle 4$	④ Vertical $\angle$'s $\cong$
⑤ $\overline{MI} \cong \overline{SL}$	⑤ Opp Sides ▱ $\cong$
⑥ $\triangle MIE \cong \triangle LSE$	⑥ AAS

Score 3: The student was missing one statement and reason to prove step 3.

Question 33

33 In quadrilateral $SMIL$ below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



Prove: $\triangle MIE \cong \triangle LSE$

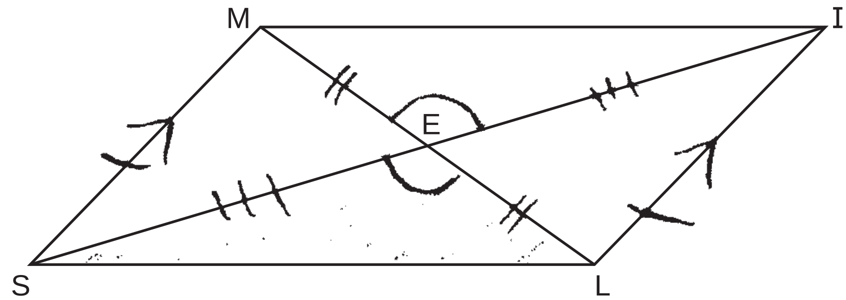
statements	reasons
① Quad SMIL Diagnols $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$	① Given
② ∠1 & 2 are vertical ∡s	② intersecting lines form vertical ∡s
③ ∠3 ≅ ∠4 & ∠5 ≅ ∠6	③ when a pair of parallel lines are cut by a transversal, alternate interior ∡s are ≅
④ Quad SMIL is a parallelogram	④ if opposite sides are both ≅ and ∥ in a quad, then a parallelogram
⑤ $\overline{MI}$ & $\overline{SL}$ are ≅	⑤ In a parallelogram, opposite sides are ≅
⑥ ∠7 ≅ ∠8	⑥ they form supplementary ∡s with the alternate interior ∡s
⑦ △MIE ≅ △LSE	⑦ AAS ≅ AAS

Score 2: The student wrote correct relevant statements and reasons in steps 4 and 5.

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.

Parallelogram

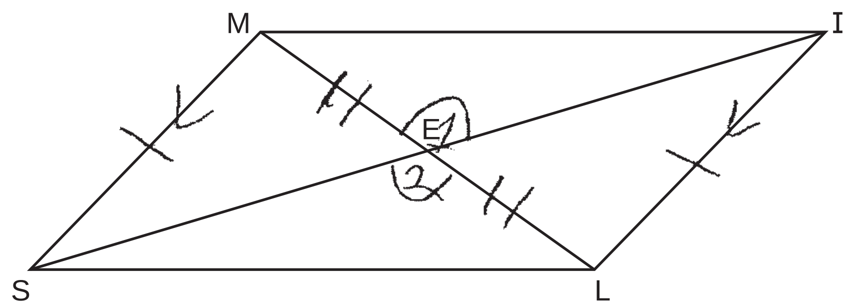


Prove: $\triangle MIE \cong \triangle LSE$

Statements:	Reasoning:
Quad SMIL	1) Given
1) ~~MS~~ $//\overline{IL}$	2) Given
2) $\overline{MS} \cong \overline{IL}$	3) Property of parallelogram (1, 2)
3) Quadrilateral SMIL is a parallelogram.	4) Given
4) Diagonals $\overline{IS}$ & $\overline{ML}$ intersect at point E	5) In a parallelogram diagonals bisect eachother.
5) $\overline{ME} \cong \overline{EL}$	6) Same reason as #5
6) $\overline{SE} \cong \overline{EI}$	7) Vertical ∠'s are ≅.
7) ∡MEI ≅ ∡SEL	

Score 2: The student wrote an incorrect reason in step 3, and the student did not prove $\triangle MIE \cong \triangle LSE$.

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



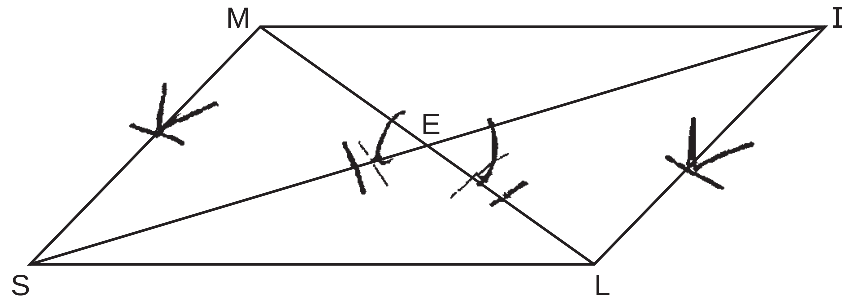
Prove: $\triangle MIE \cong \triangle LSE$

statement	Reason
(1) in quadrilateral SMIL below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$ and (S) $\overline{MS} \cong \overline{IL}$	(1) Given
(S) (2) $\overline{ME} \cong \overline{LE}$	(2) A midpoint divides a segment into 2 ≅ segments
(A) (3) $\angle 1 \cong \angle 2$	(3) intersecting lines form ≅ vertical angles
(4) $\triangle MIE \cong \triangle LSE$	(4) SAS ≅ SAS

Score 1: The student wrote only one correct relevant statement and reason in step 3.

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point *E*, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



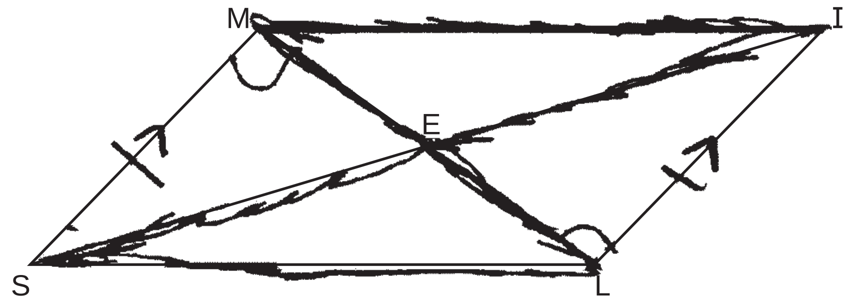
Prove: $\triangle MIE \cong \triangle LSE$

Statement	Reason
1. quad SMIL $\overline{MS} \parallel \overline{IL}$ $\overline{MS} \cong \overline{IL}$	1. Given
2. SMIL is a paralelogram	2. one pair of opposite sides are parallel and congruent then it is a paralelogram
3. $\overline{ML} \cong \overline{SI}$	3. Diagonals are congruent
4. ∠MES + ∠IEL are vertical ∠s	4. Intersecting lines form vertical ∠s
5. ∠MES ≅ ∠IEL	5. All vertical ∠s are ≅
6. △MIE ≅ △LSE	6. SAS ≅ SAS

Score 1: The student wrote only one correct relevant statement and reason in step 2.

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.

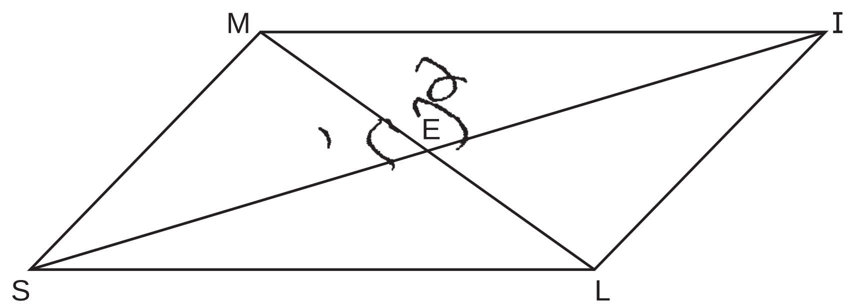


Prove: $\triangle MIE \cong \triangle LSE$

statement	Reason
① Quad SMIL, diagonals $\overline{IS}$ + $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$ and $\overline{MS} \cong \overline{IL}$	① Given
② Quad SMIL is a parallelogram	② If a quad with one pair of opposite sides both parallel and congruent, then a parallelogram
③ $\angle SME \cong \angle ILE$, $\angle$	③

Score 1: The student wrote only one correct relevant statement and reason in step 2.

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.

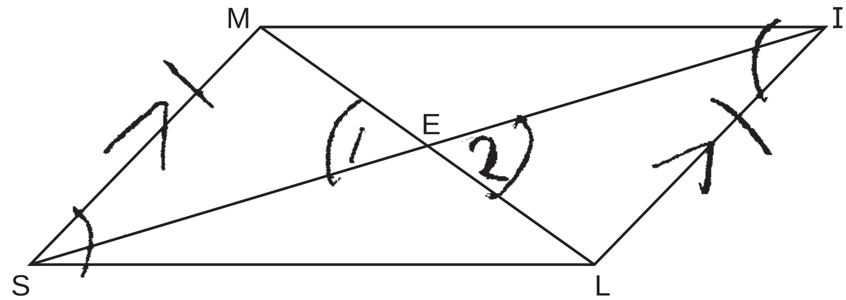


Prove: $\triangle MIE \cong \triangle LSE$

Statements	Reasons
1 $\overline{MS} \parallel \overline{IL}$, $\overline{MS} \cong \overline{IL}$, Intersect at E	1 Given
2 $E \cong E$	2 Reflexive
3 $\angle 1 + \angle 2 = 180$	3 complementary angle
4 E is the midpt	4 Midpt
5 $\triangle MIE \cong \triangle LSE$	5 vertical angles are [illegible]

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

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.



Prove: $\triangle MIE \cong \triangle LSE$

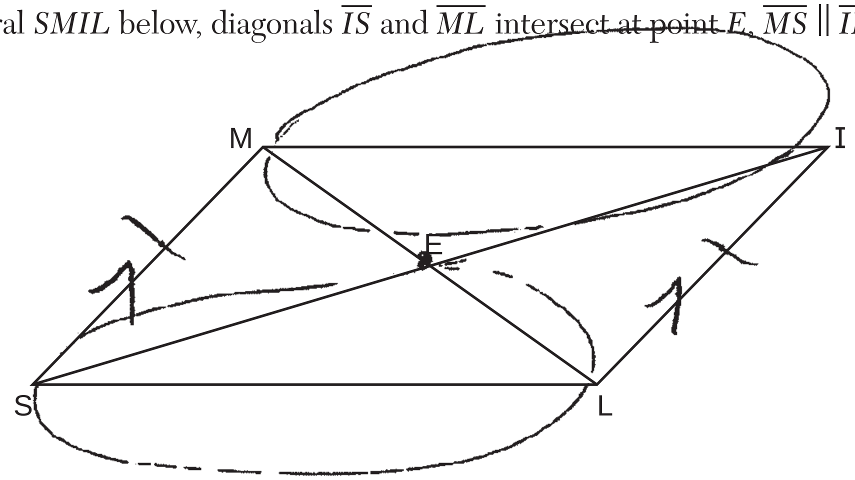
statement	reasons
1. In quadrilateral SMIL below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$	1. Given
2. $\angle 1 \cong \angle 2$	2. opposite angles are congruent
3. $\angle S \cong \angle I$	3. If two parallel lines are cut by a transversal, then alternate interior angles are congruent.

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

Question 33

33 In quadrilateral *SMIL* below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.

SSS
SAS
ASA



Prove: $\triangle MIE \cong \triangle LSE$

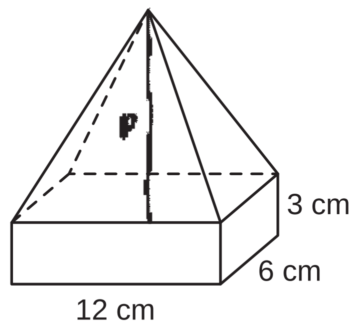
statement
6) $\Delta MIE \cong \Delta LSE$
Reasoning
6) ASA ≅ ASA

Statements	Reasoning
1) $\overline{IS}$ and $\overline{ML}$ intersect at point E; $\overline{MS} \parallel \overline{IL}$; $\overline{MS} \cong \overline{IL}$	1) Given
2) $\angle SEL \cong \angle IEM$	2) Intersecting lines create vertical angles
3) ~~Quadrilateral~~ $\square SMIL$ is a parallelogram	3) Two sets of congruent sides
4) $\overline{SL} \cong \overline{IM}$	4) Definition of a parallelogram
5) $\angle ELS \cong \angle EMI$	5) Alternate interior angles

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

Recatngller prism : $(12)(6)(3) = 216$

Pyramid : $\frac{1}{3}(12 \cdot 6)(10) = 240$

$$\begin{array}{r} 240 \\ +216 \\ \hline 456 \end{array}$$

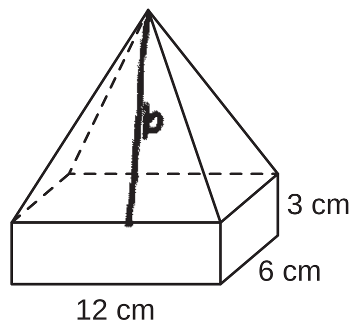
$456(2.5) = 1140$

1140g

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

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

$V = Bh$

$12 \cdot 6 \cdot 3 = 216$

$\frac{1}{3} \cdot 12 \cdot 6 \cdot 10 = 240$

$216 + 240 = 456$

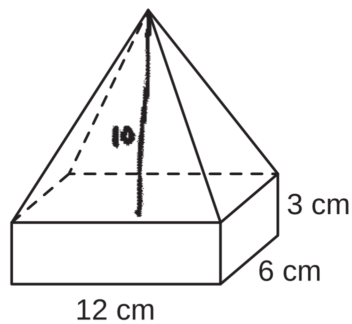
$456\,(2.5) =$

1140 Grams

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

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

$B = 12(6) = 72$

$V = (72)(3)$ $\quad V = \frac{1}{3}(72)(10)$

$V = 216$ $\quad V = 240$

456

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

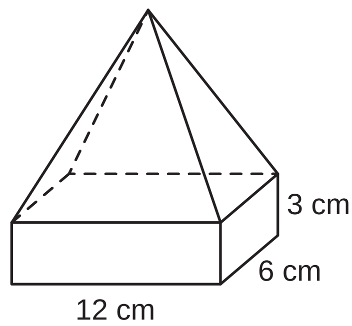
$\frac{2.5}{1} = \frac{x}{456}$

$\boxed{x = 1140\text{g}}$

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

$V = 12 \cdot 6 \cdot 3$

$V = 216 \text{ cm}^3$

$\times 2.5$

$M = 540 \text{ g}$

$V = \frac{1}{3} 12 \cdot 6 \cdot 10$

$V = 240 \text{ cm}^3$

$\times 2.5$

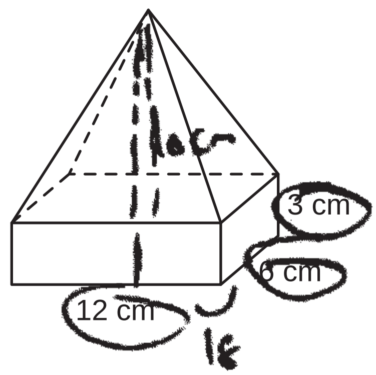
$M = 600 \text{ g}$

$\boxed{M = 1140 \text{ g}}$

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

$12 \times 6 \times 3 = 216$

$V = 10 \times 18 = 180$

$$\begin{array}{r} 216 \\ +180 \\ \hline 396 \end{array}$$

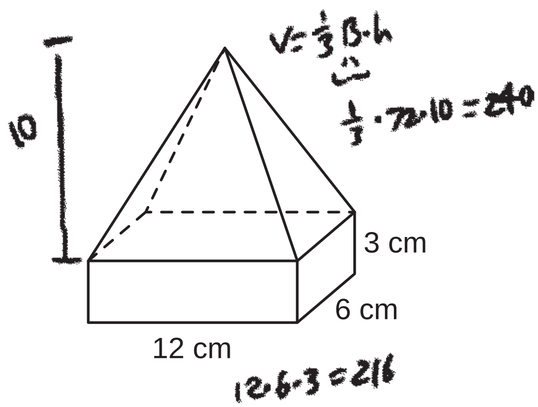
396×2.5 grams $=$

990 grams

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



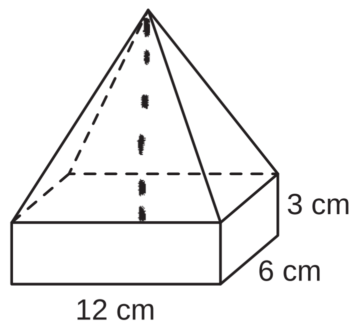
The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

$$\begin{array}{r} 240 \\ +\ 216 \\ \hline 456 \end{array}$$

Score 3: The student correctly determined the total volume of the trophy.

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

$V = (12)(6)(3)$
$V = 216$

$V = \frac{1}{3}(12)(10)$
$V = 40$

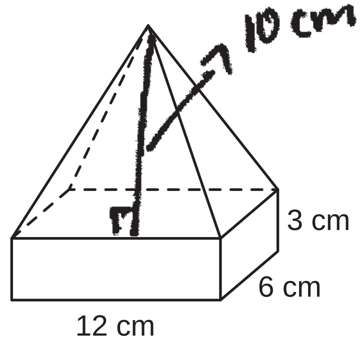
$216 + 40 = 256$

$256 \times 2.5 = \boxed{640 \text{ grams}}$

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

V ▭ = Bh

V = (12·6)3

V = 216

V Δ = Bh

V = (12·6)10

V = 720

216

936

936

×2.5

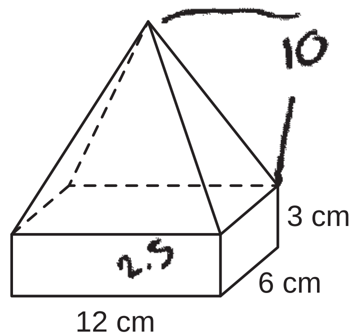
2340

The mass of the trophy is 2340 grams

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

$V=\frac{1}{3}12\cdot 10$ $\quad$ $V=12\cdot 3$

$V=40$ $\quad$ $V=36$

$\underbrace{\qquad\qquad}_{76}$

$\frac{x}{76}=2.5$

$\frac{m}{v}=d$

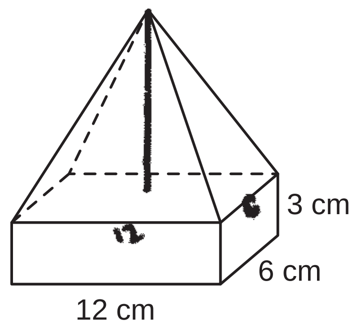
$x=190$

Score 2: The student made an error when determining the volume of the prism and an error when determining the volume of the pyramid.

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.

$12 \cdot 6 = 72$



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

$V = \frac{1}{3}(72)(10)$
$V = 24(10)$
$V = 240 \text{ cm}^3$

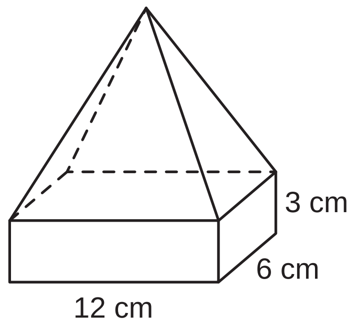
$2.5 \cdot 240 = 600g$

600 grams is the mass of the trophy.

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

Vol Prism

$V = (12)(6)(3)$

$V = 216$

Vol Pyramid

$V = (12)(6)(10)$

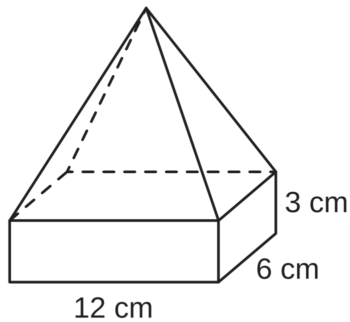
$V = 720$

$936 \div 2.5 = 374.4$

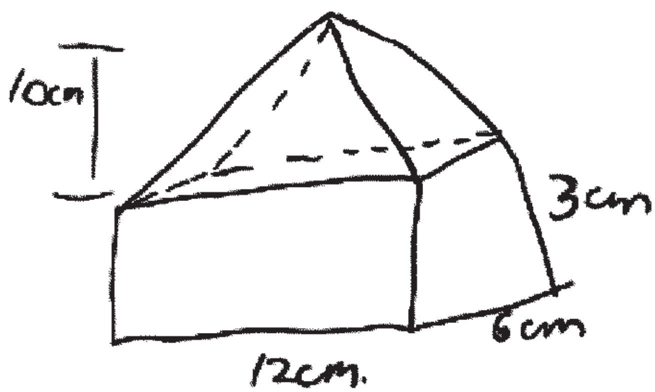
Score 2: The student made an error when determining the volume of the pyramid and made an error when determining the mass of the trophy.

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.



$V = 12 \cdot 3 \cdot 6 = 216$

$V = \frac{1}{3}(216) \cdot 10$

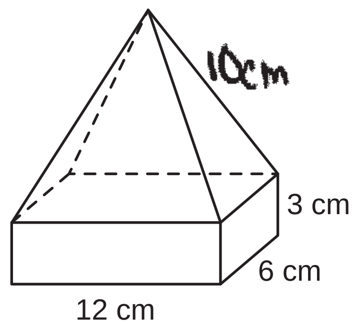
$V = 72 \cdot 10$

$V = 720$

Score 1: The student correctly determined the volume of the prism.

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

V= L x W x H

12x6x10

V= 720

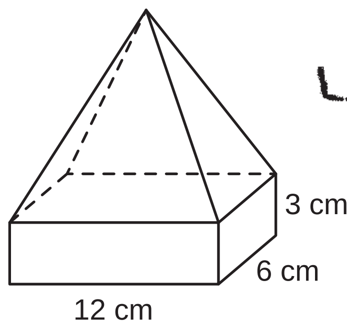
M=V·D

720 • 2.5 = 1800g

Density

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

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



$L=12$

$w=6$

$h=3$

$h=10$

The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

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

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

$2.5g=\frac{1}{3}\cdot 10$

$V=l\cdot w\cdot h$

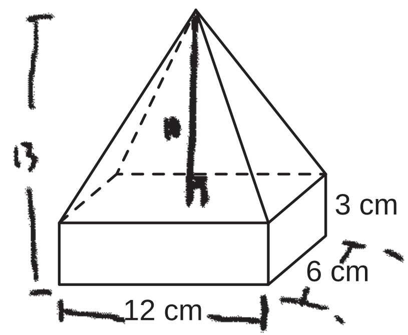
$V=12\cdot 6\cdot 3$

$V=216$

Score 1: The student correctly determined the volume of the prism.

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

$d = \frac{h}{m}$ $\quad m \cdot 2.5 = \frac{10}{m} \cdot n$

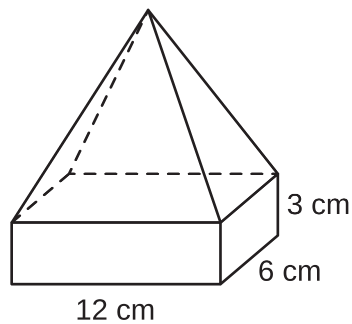
$\frac{m \cdot 2.5}{2.5} = \frac{10}{2.5}$

$m = 4$

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

Question 34

34 A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled below. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.



The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

volume pyramid = 240

$\boxed{600 \text{ g}}$

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

Question 35

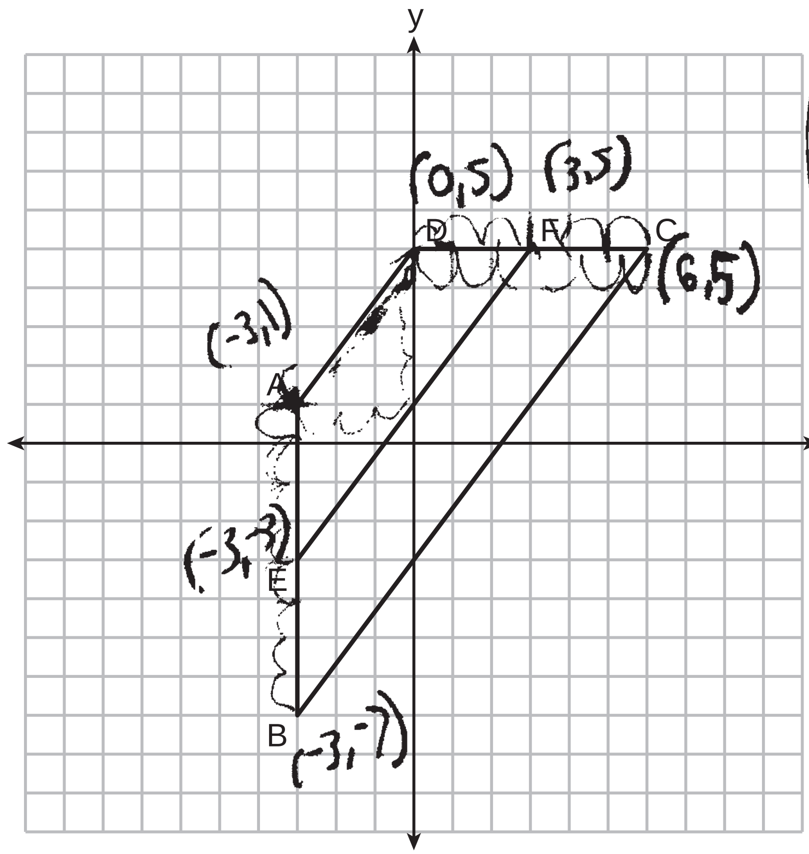
35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.

$\overline{AD}$

X	Y
-3	1
0	5
A	D

$\overline{BC}$

X	Y
-3	-7
6	5



Quadrilateral ABCD is a trapezoid because $\overline{AD} \parallel \overline{BC}$

Slope $= \frac{5-(-7)}{6-(-3)} = \frac{12}{9}$

Slope of $\overline{BC}$ $\boxed{\frac{4}{3}}$

Prove *ABCD* is a trapezoid.

Slope $= \left(\frac{5-1}{0-(-3)}\right)$

Slope of $\overline{AD} = \boxed{\frac{4}{3}}$

For lines to be $\parallel$ the slope is the same

$\overline{AD} \parallel$ to $\overline{BC}$

Question 35 is continued on the next page.

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

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$\overline{EF}$

x	y
-3	-3
3	5

Slope $= \frac{5-(-3)}{3-(-3)} = \frac{8}{6} = \frac{4}{3}$

$\boxed{\begin{array}{l}\text{Slope of } \overline{EF} = \frac{4}{3} \\ \text{Slope of } \overline{AD} = \frac{4}{3} \\ \text{Slope of } \overline{BC} = \frac{4}{3}\end{array}}$

The slopes ae the same for all 3 lines
∴ they ae ‖ to one another.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$AD = \sqrt{(0-(-3))^2 + (5-1)^2}$

$\sqrt{9+16}$

$\sqrt{25}$

$\boxed{AD = 5}$

$EF = \sqrt{(3-(-3))^2 + (5-(-3))^2}$

$\sqrt{36+64}$

$\sqrt{100}$

$\boxed{EF = 10}$

$BC = \sqrt{(6-(-3))^2 + (5-(-7))^2}$

$BC = \sqrt{81 + 144}$

$\sqrt{225}$

$\boxed{BC = 15}$ $(AD+BC) = 20$

Yes EF is Half of (AD + BC)

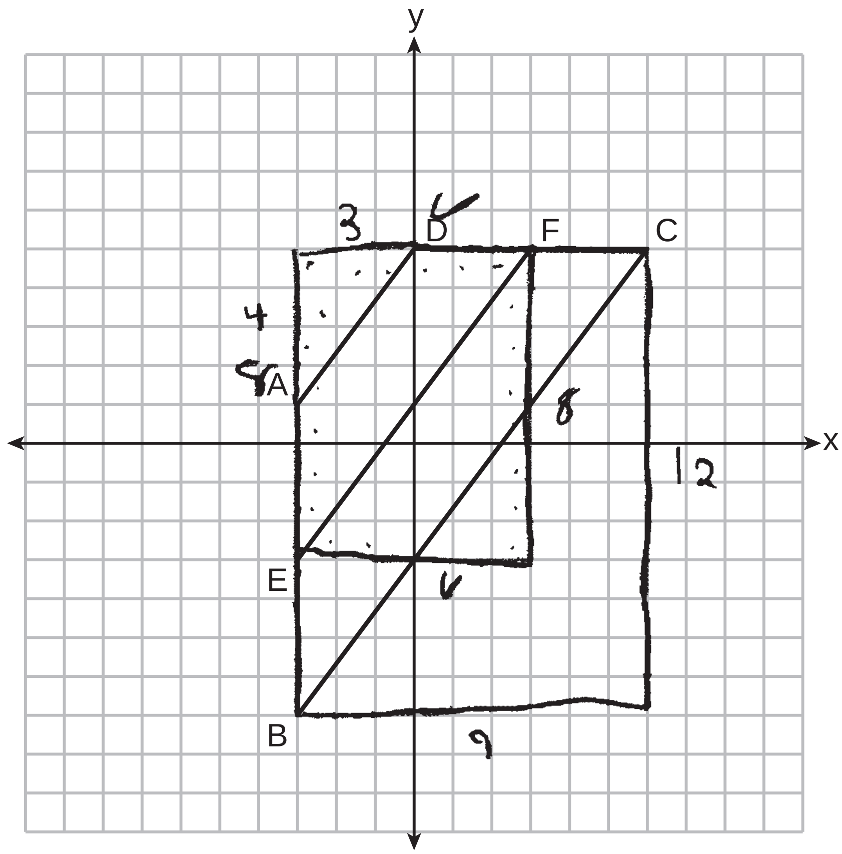
$EF = 10$

$AD + BC = 20$

10 is half of 20

$EF = \frac{1}{2}(AD+BC)$ ✓

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment EF is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

slope $\overline{BC} = \frac{12}{9} = \frac{4}{3}$

slope $\overline{AD} = \frac{4}{3}$ ∥

slope $\overline{EF} = \frac{8}{6} = \frac{4}{3}$

ABCD is a trapezoid because it has 2 parallel sides

Question 35 is continued on the next page.

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

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$ because they have the same slope.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

EF $6^2+8^2=c^2$
$36+64=c^2$
$\sqrt{100}=\sqrt{c^2}$
$\boxed{10=c}$

AD $4^2+3^2=c^2$
$16+9=c^2$
$\sqrt{25}=\sqrt{c^2}$
$\boxed{c=5}$

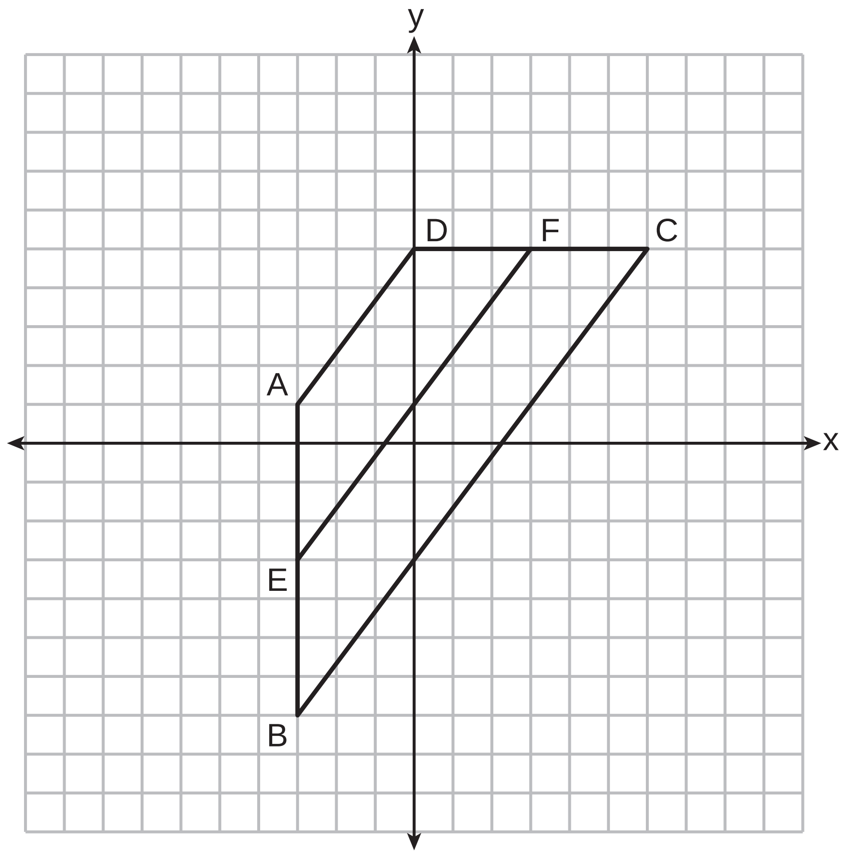
BC $12^2+9^2=c^2$
$144+81=c^2$
$\sqrt{225}=\sqrt{c^2}$
$\boxed{15=c}$

Yes

$10=\frac{1}{2}(5+15)$
$10=\frac{1}{2}(20)$
$\boxed{10=10}$ ✓

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$A(-3,1)$ +3, +4
$D(0,5)$

$\frac{5-1}{0-(-3)}$

$\frac{4}{3}$

$B(-3,-7)$ +9, +12
$C(6,5)$

$\frac{5-(-7)}{6-(-3)}$

$\frac{12}{9} = \frac{4}{3}$

$\overline{AD}$ and $\overline{BC}$ are parallel b/c they have the same slope, making ABCD a quadrilateral

Question 35 is continued on the next page.

Score 5: The student wrote an incorrect concluding statement when proving the trapezoid.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$\frac{y_2 - y_1}{x_2 - x_1}$

$\overline{AD}$: $\frac{5-1}{0+3}$ $\frac{4}{3}$

$\overline{BC}$: $\frac{5+7}{6+3}$ $\frac{12}{9} = \frac{4}{3}$

$\overline{EF}$: $\frac{5+3}{3+3} = \frac{8}{6} = \frac{4}{3}$

They all have the same slope then these are all parallel.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

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

$\sqrt{(0+3)^2 + (5-1)^2} \rightarrow AD$ 5

$\sqrt{(6+3)^2 + (5+7)^2} \rightarrow BC$ $\sqrt{81 + 144} = 15$

$\sqrt{(3+3)^2 + (5+3)^2} \rightarrow EF$ 10

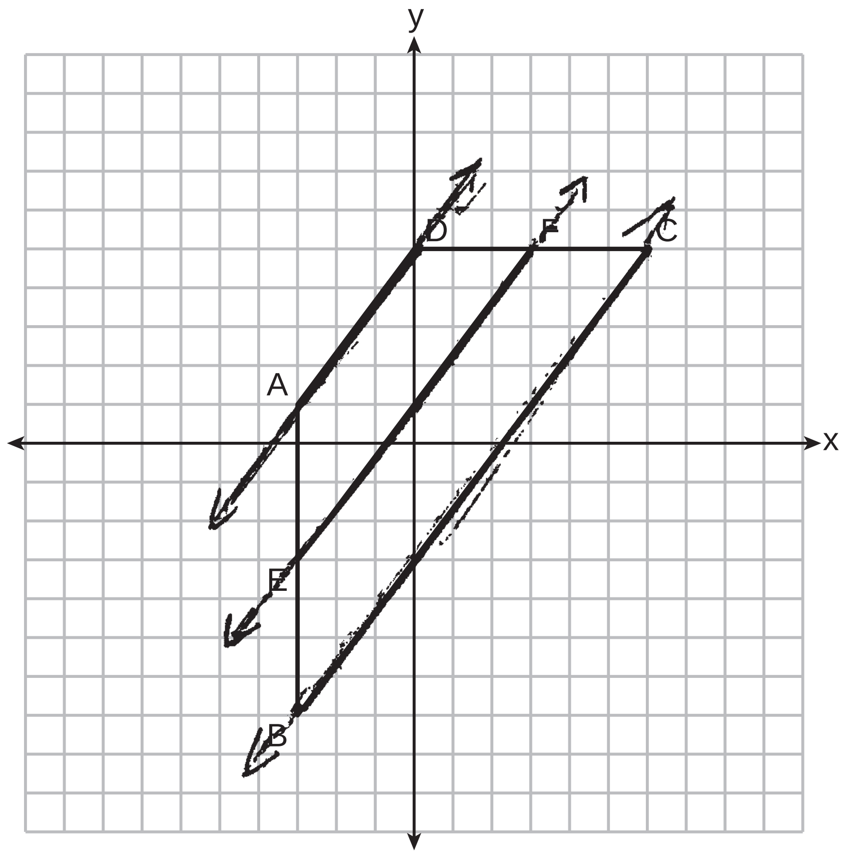
yes

$10 = \frac{1}{2}(15 + 5)$

$10 = \frac{1}{2}(20)$ ✓

$10 = 10$

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

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

2 Sides are parallel

Question 35 is continued on the next page.

Score 5: The student determined the slope of $\overline{AD}$ and $\overline{BC}$ on the next page, but did not write a concluding statement when proving the trapezoid.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$m\overline{EF} = \frac{5-(-3)}{3-(-3))} = \frac{8}{6}$

$m\overline{EF} = 1.\overline{3}$

$m\overline{AD} = \frac{5-1}{0-(-3)} = \frac{4}{3}$

$m\overline{AD} = 1.\overline{3}$

$m\overline{BC} = \frac{5-(-7)}{6-(-3)} = \frac{12}{9}$

$m\overline{BC} = 1.\overline{3}$

They are parallel because they each have the same slope.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$E = (-3,-3)$
$F = (3,5)$ > $EF = 10$

$A = (-3,1)$
$D = (0,5)$ > $AD = 5$

$B = (-3,-7)$
$C = (6,5)$ > $BC = 15$

$\sqrt{(3-(-3))^2 + (5-(-3))^2}$

$\sqrt{(6)^2 + (8)^2}$

$D = \sqrt{100}$

$D = 10$

$\sqrt{(0-(-3))^2 + (5-1)^2}$

$\sqrt{9 + 16}$

$\sqrt{25}$

$D = 5$

$\sqrt{(6-(-3))^2 + (5-(-7))^2}$

$\sqrt{81 + 144}$

$\sqrt{225}$

$D = 15$

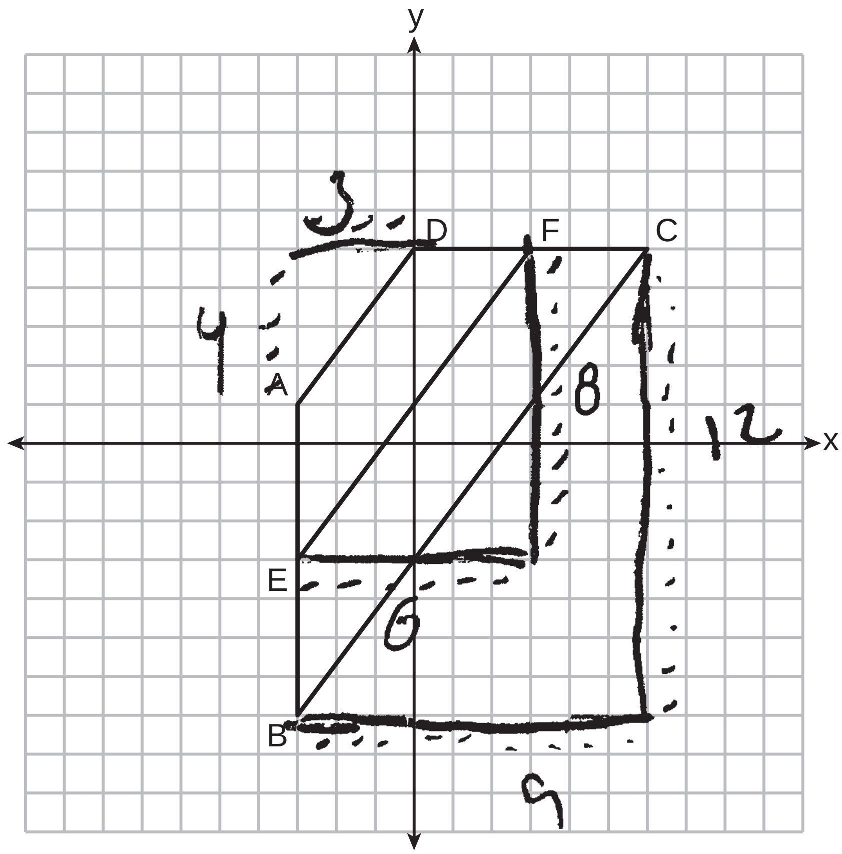
$10 = \frac{1}{2}(5+15)$

$10 = \frac{1}{2}(20)$

$10 = 10$ ✓

yes

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$\overline{AD}$ slope $= \frac{4}{3}$ $\overline{BC}$ slope $= \frac{12}{9} = \frac{4}{3}$

// sides

b/c same slope

ABCD is a trapezoid b/c it has one pair of // opp sides

Question 35 is continued on the next page.

Score 5: The student made a substitution error when justifying $EF = \frac{1}{2}(AD + BC)$.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$\overline{AD}$: slope = $\frac{4}{3}$ ($\overline{BC}$: slope = $\frac{12}{9} = \frac{4}{3}$) ($\overline{EF}$: slope = $\frac{8}{6} = \frac{4}{3}$)

all have = slopes which means that they are all //.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$10 \overset{?}{=} \frac{1}{2}(15 + 10)$

$10 = \frac{1}{2} \times 15$

$10 \neq 7.5$

No

BC

$9^2 + 12^2 = x^2$

$225 = x^2$

$15 = x$

EF

$8^2 + 6^2 = x^2$

$64 + 36 = x^2$

$100 = x^2$

$10 = x$

AD

$4^2 + 3^2 = x^2$

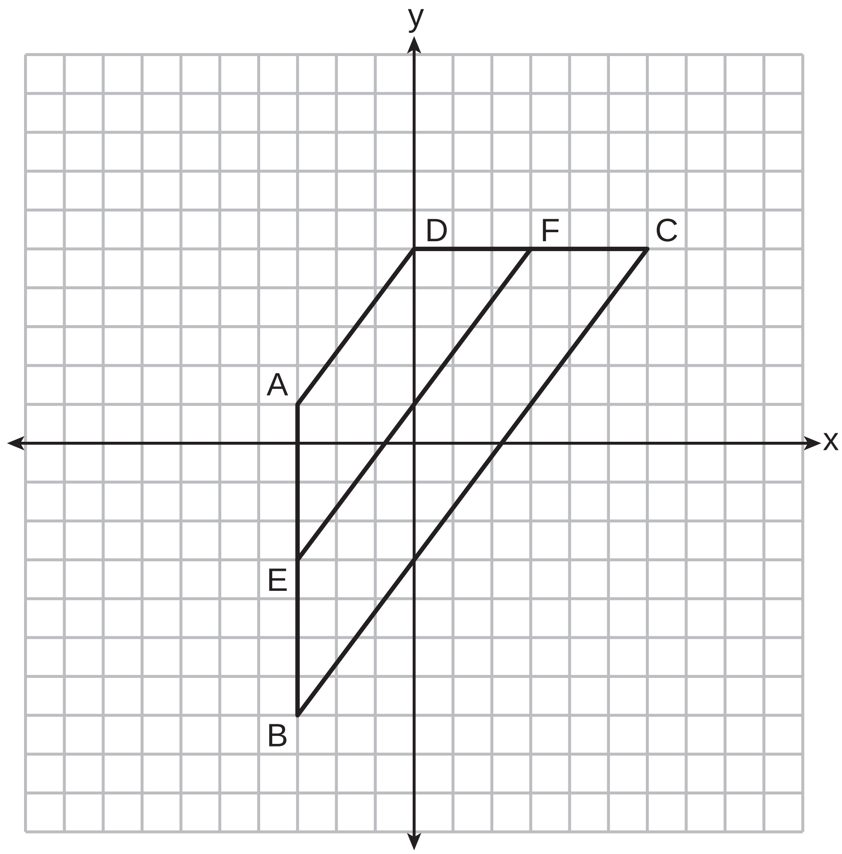
$16 + 9 = x^2$

$25 = x^2$

$5 = x$

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$\overline{AD}$: $\dfrac{0--3}{5-1} \rightarrow 3/4$

$\overline{BC}$: $\dfrac{6--3}{5--7} \rightarrow 3/4$

$\parallel$

a trapezoid is a quadrilateral with at least one pair of parallel sides. $\overline{AD} \parallel \overline{BC}$, so ABCD is a trapozoid

Question 35 is continued on the next page.

Score 5: The student made the same computational error when determining the slopes of $\overline{AD}$, $\overline{BC}$, and $\overline{EF}$.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$$\frac{X_2 - X_1}{Y_2 - Y_1}$$

$$\frac{3 - -3}{5 - -3} = \boxed{3/4}$$ E (-3, -3) F (3, 5)

$$\frac{0 - -3}{5 - 1} = \boxed{3/4}$$ A (-3, 1) D (0, 5)

They all have the same slope of 3/4 thus they're parallel

$$\frac{6 - -3}{5 - -7} = \boxed{3/4}$$ B (-3, -7) C (6, 5)

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$$AD \sqrt{(0 - -3)^2 + (5 - 1)^2} = 5$$

5+15

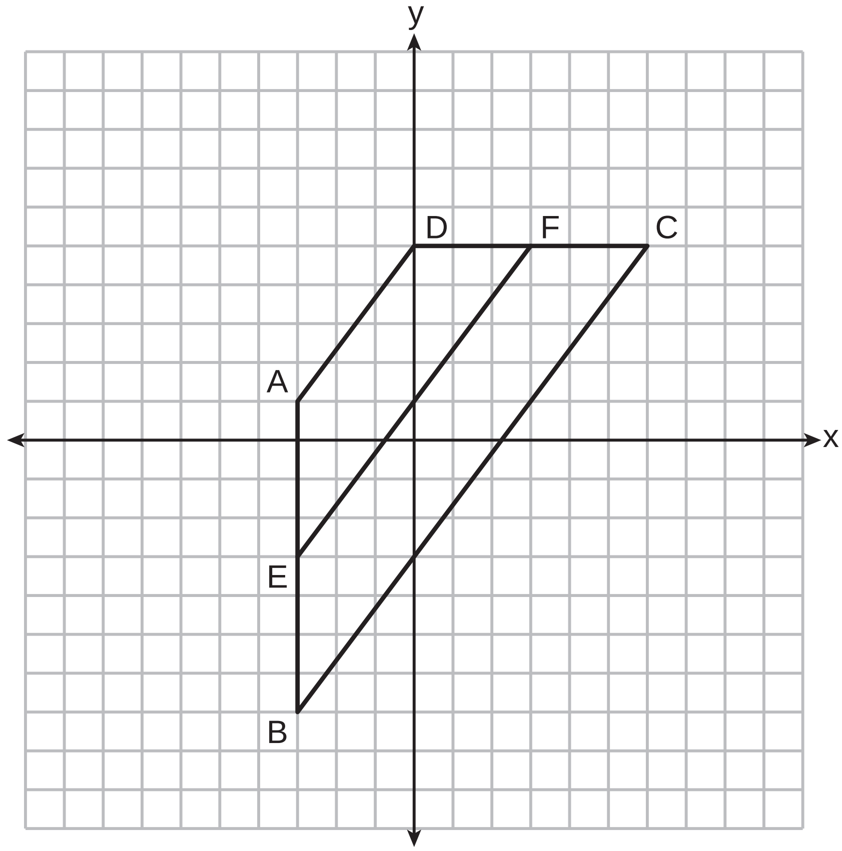
$20/2 = 10$

$$BC \sqrt{(6 - -3)^2 + (5 - -7)^2} = 15$$

Yes

$$EF \sqrt{(3 - -3)^2 + (5 - -3)^2} = 10$$

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$m_{\overline{AB}} = \frac{-7-1}{-3--3} = \frac{-8}{0}$

$m_{\overline{BC}} = \frac{5--7}{6--3} = \frac{12}{9} = \frac{4}{3}$

$m_{\overline{CD}} = \frac{5-5}{0-6} = \frac{0}{-6}$

$m_{\overline{AD}} = \frac{5-1}{0--3} = \frac{4}{3}$

$d_{\overline{AB}} = \sqrt{(-3+-3)^2 + (-7+1)^2}$

$d = \sqrt{(-6)^2 + (-6)^2}$

$= \sqrt{36+36}$

$= \sqrt{72}$

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

$d_{\overline{BC}} = \sqrt{(6+-3)^2 + (5+-7)^2}$

$= \sqrt{9+4}$

$= \sqrt{13}$

$d_{\overline{CD}} = \sqrt{(0+6)^2 + (5+5)^2}$

$= \sqrt{36+100}$

$= \sqrt{136}$

$d_{\overline{AD}} = \sqrt{(0+-3)^2 + (5+1)^2}$

$= \sqrt{9+36}$

$= \sqrt{45}$

∴ There is one set of parallel lines and no set of lines are equal distance.

Question 35 is continued on the next page.

Score 4: The student wrote an incomplete concluding statement when proving the trapezoid. The student made the same computational error when determining the lengths of $\overline{AD}$, $\overline{BC}$, and $\overline{EF}$.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$m\overline{EF} = \frac{5--3}{3--3} = \frac{8}{6} = \frac{4}{3}$

E(-3,-3) F(3,5)

$m\overline{AD} = \frac{4}{3}$

$m\overline{BC} = \frac{4}{3}$

All three slopes are the same and are parallel, because equal slopes means parallel.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$d_{\overline{EF}} = \sqrt{(5+-3)^2 + (3+-3)^2}$

$= \sqrt{4+0}$

$= \sqrt{4}$

$= 2$

$2 = \frac{1}{2}(6.71 + 3.61)$

$2 = \frac{1}{2}(10.32)$

$2 \neq 5.16$

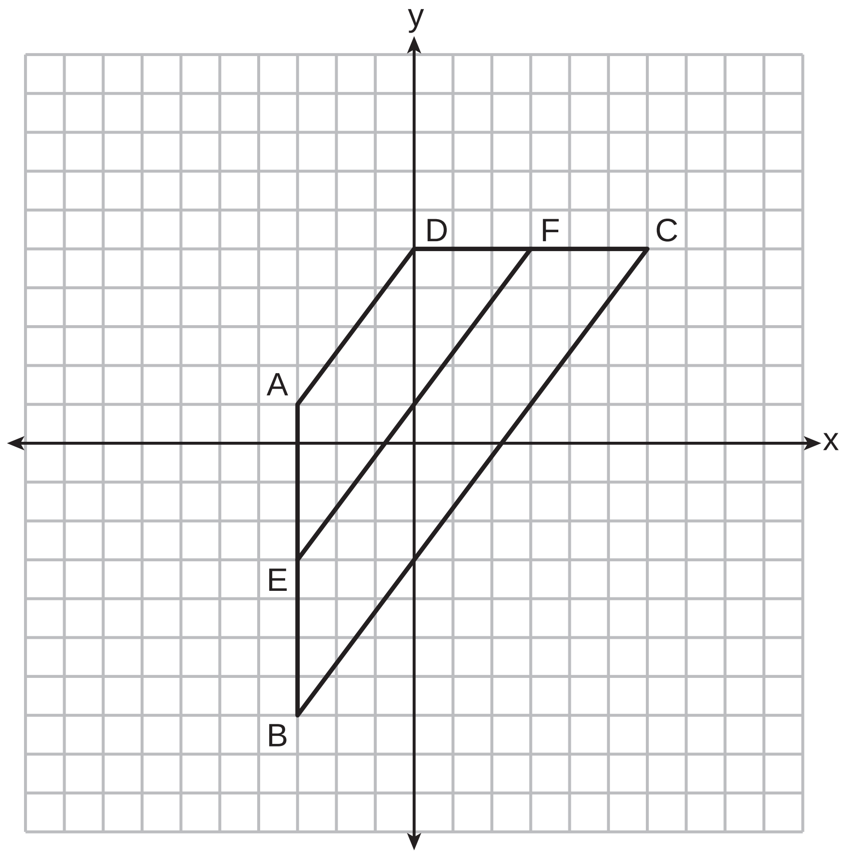
$d_{\overline{AD}} = 6.71$

$d_{\overline{BC}} = 3.61$

No, EF is not half of (AD and BC).

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment EF is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

ABCD is a trapezoid because it contains 2 parallel sides ($\overline{AD}$ and $\overline{BC}$)

Question 35 is continued on the next page.

Score 4: The work for proving *ABCD* is a trapezoid was shown on the next page. The student showed no correct work when justifying $EF = \frac{1}{2}(AD + BC)$.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$m\overline{EF} = \frac{4}{3}$ $m\overline{AD} = \frac{4}{3}$ $m\overline{BC} = \frac{4}{3}$

~~I got this by counting the [illegible] & [illegible] on each of the lines.~~ they have the same slope which means that they're parallel. I got the slope by using coordinate geometry. $\frac{y_2 - y_1}{x_2 - x_1}$

$m\overline{EF} = \frac{5 - -3}{3 - -3} = \frac{8}{6} = \boxed{\frac{4}{3}}$ $m\overline{AD} = \frac{5-1}{0-3} = \boxed{\frac{4}{3}}$ $m\overline{BC} = \frac{5 - -7}{6 - -3} = \frac{12}{9} = \boxed{\frac{4}{3}}$

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$EF = 8$ units

$AD = 4$ units

$BC = 12$ units

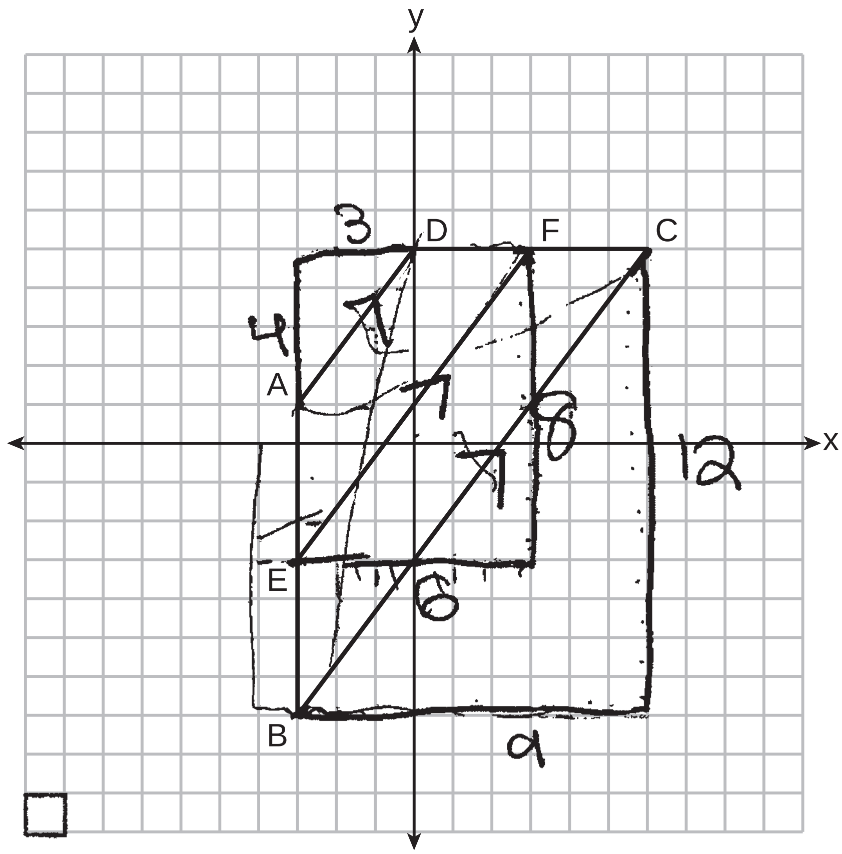
$8 = \frac{1}{2}(4 + 12)$

$8 = \frac{1}{2}(16)$

$8 = 8$

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$m\overline{AD}: \frac{4}{3}$ $m\overline{BC}: \frac{12}{9} = \frac{4}{3}$

ABCD is a trapezoid because the opposite sides have equal slopes which makes them congruent

Question 35 is continued on the next page.

Score 3: The student wrote an incorrect concluding statement when proving the trapezoid. The student showed no correct work when justifying $EF = \frac{1}{2}(AD + BC)$.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$m\overline{BC}: \frac{12}{9} = \frac{4}{3}$

$m\overline{AD}: \frac{4}{3}$

$m\overline{EF}: \frac{8}{6} = \frac{4}{3}$

$\overline{EF}$ is $\parallel$ to $\overline{AD}$ and $\overline{BC}$ because they all have equal slopes and $\parallel$ lines have $=$ slopes.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$EF = \frac{1}{2}(AD + BC)$

$\frac{4}{3} = \frac{1}{2}\left(\frac{4}{3} + \frac{4}{3}\right)$

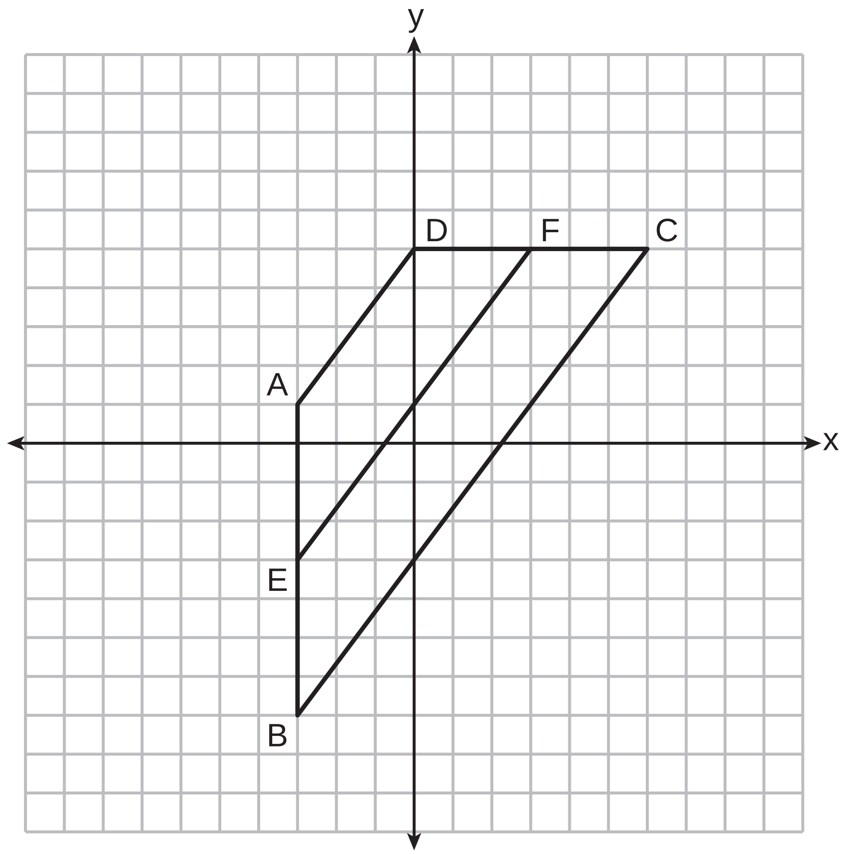
$\frac{4}{3} = \frac{1}{2}\left(\frac{8}{3}\right)$

$\frac{4}{3} = \frac{4}{3}$ ✓

yes, $EF = \frac{1}{2}(AD + BC)$

Question 35

35 Quadrilateral $ABCD$ is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment EF is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove $ABCD$ is a trapezoid.

$\overline{AD}$ slope

$$\frac{5-1}{0-3} = \frac{4}{3}$$

$\overline{CB}$ slope

$$\frac{5--7}{6--3} = \frac{12}{9} = \frac{4}{3}$$

so $\overline{AD} \parallel \overline{CB}$ because same slope

ABCD is a trapedzeid because it has 1 pair of parallel sides.

Question 35 is continued on the next page.

Score 3: The student did not write a concluding statement when proving $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$. The student did not justify $EF = \frac{1}{2}(AD + BC)$.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

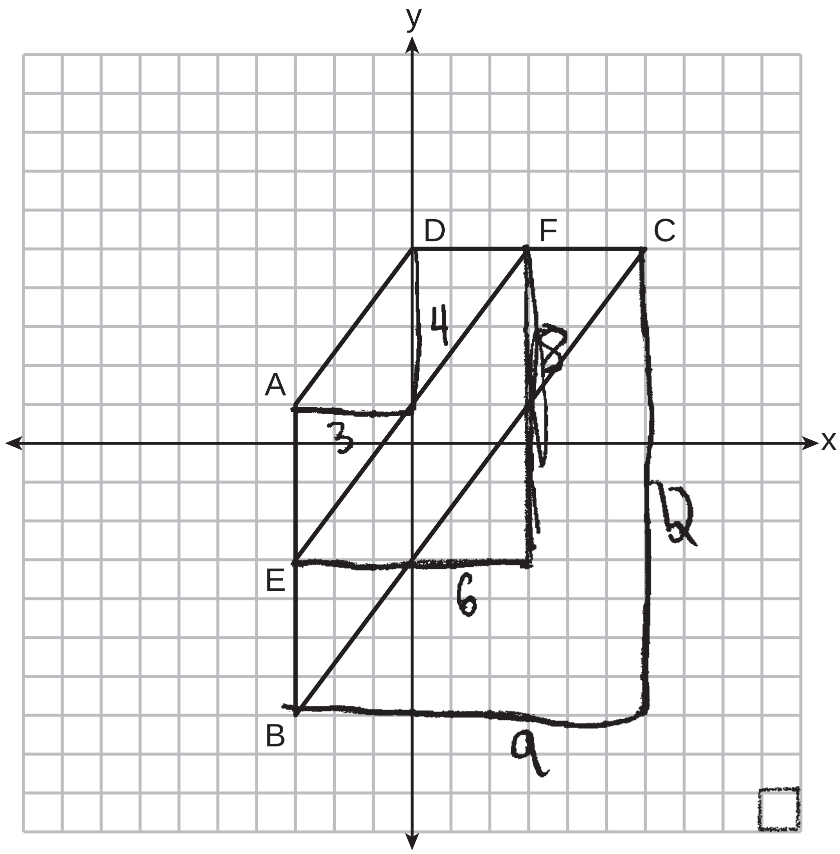
slope $\overline{AD} = \frac{4}{3}$

slope $\overline{BC} = \frac{4}{3}$

slope $\overline{EF} = \frac{5 - -3}{3 - -3} = \frac{8}{6} = \frac{4}{3}$

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

Question 35 is continued on the next page.

Score 3: The student did not prove ABCD is a trapezoid. The student made the same computational error when determining the slopes of $\overline{AD}$, $\overline{BC}$, and $\overline{EF}$.

Question 35 continued.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$m\overline{EF} = \frac{6}{8} = \frac{3}{4}$

$\parallel$ $\overline{EF}$ is $\parallel$ to $\overline{AD}$ and $\overline{BC}$

$m\overline{AD} = \frac{3}{4}$

$\parallel$

$m\overline{BC} = \frac{9}{12} = \frac{3}{4}$

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$10 = \frac{1}{2}(5+15)$

$10 = \frac{1}{2}(20)$

$10 = 10$ ✓

yes

$\overline{AD}$

$D = \sqrt{(-3-0)^2 + (1-5)^2}$

$D = 5$

$\overline{BC}$

$D = \sqrt{(-3-6)^2 + (-7-5)^2}$

$D = 15$

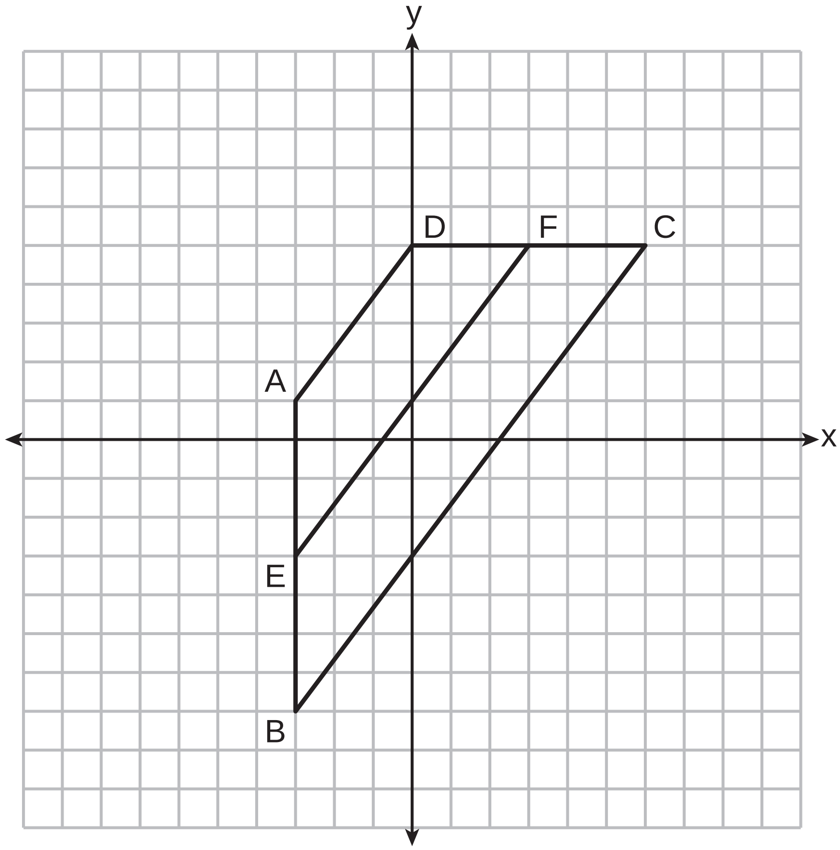
$\overline{EF}$

$D = \sqrt{(-3-3)^2 + (-3-5)^2}$

$D = 10$

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

ABCD isnt a trapezoid because there isnt a set of parallel sides or 2 sets of congruent sides

~~Statement~~ ~~Reason~~

~~(1) EF~~

$D = \sqrt{(x^2 - x^1)^2 + (y^2 - y^1)^2}$

$D\overline{AB} = \sqrt{(-3+3)^2 + (1+7)^2} = \sqrt{0+64} = 8$

$D\overline{BC} = \sqrt{(-3-6)^2 + (-7-5)^2} = \sqrt{81+144} = 15$

$D\overline{CD} = \sqrt{(6-0)^2 + (5-5)^2} = \sqrt{36+0} = 6$

$D\overline{DA} = \sqrt{(0+3)^2 + (5-1)^2} = \sqrt{9+16} = 5$

$S = \left(\frac{x^2 + x^1}{2}, \frac{y^2 + y^1}{2}\right)$

$S\overline{AB} = \frac{-3-3}{2}, \frac{1-7}{2} = (-3, -3)$

$S\overline{BC} = \frac{-3+6}{2}, \frac{-7+5}{2} = (1.5, -1)$

$S\overline{CD} = \frac{6+0}{2}, \frac{5+5}{2} = (3, 5)$

$S\overline{DA} = \frac{0-3}{2}, \frac{5+1}{2} = (-1.5, 3)$

Question 35 is continued on the next page.

Score 2: The student correctly justified $EF = \frac{1}{2}(AD + BC)$.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$S\overline{AD} = (-1.5, 3)$

$S\overline{BC} = (1.5, -1)$

$S\overline{EF} = \frac{-3+3}{2}, \frac{-3+5}{2} = (0, 1)$

$\overline{EF}$ isnt parallel to $\overline{AD}$ and $\overline{BC}$
Because they dont have the Same slopes.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$D\sqrt{(-3-3)^2+(-3-5)^2} = \sqrt{36+64} = 10$

$\overline{EF}$

$10 = \frac{1}{2}(5+15)$

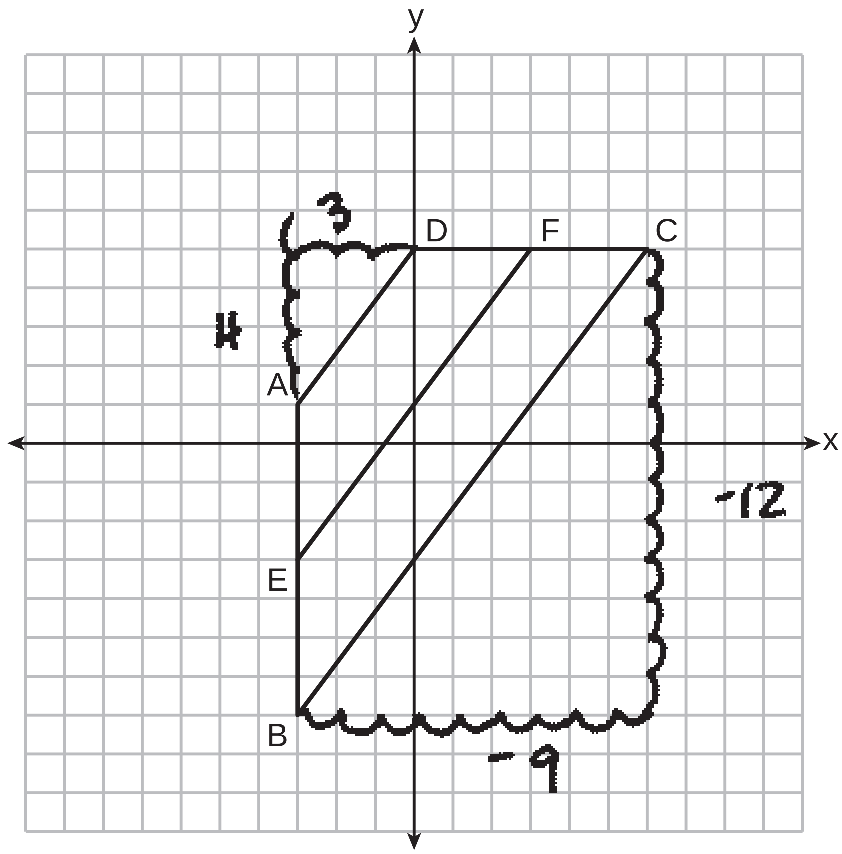
$10 = \frac{1}{2}(20)$

$10 = 10$

Yes $EF = \frac{1}{2}(AD+BC)$

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

slope $\overline{AD} = \frac{4}{3}$

Slope of $\overline{CB} = \frac{-12}{-9} = \frac{4}{3}$

Same Slopes ∴ ∥

ABCD is a trapezoid because $\overline{AD} \parallel \overline{CB}$

Question 35 is continued on the next page.

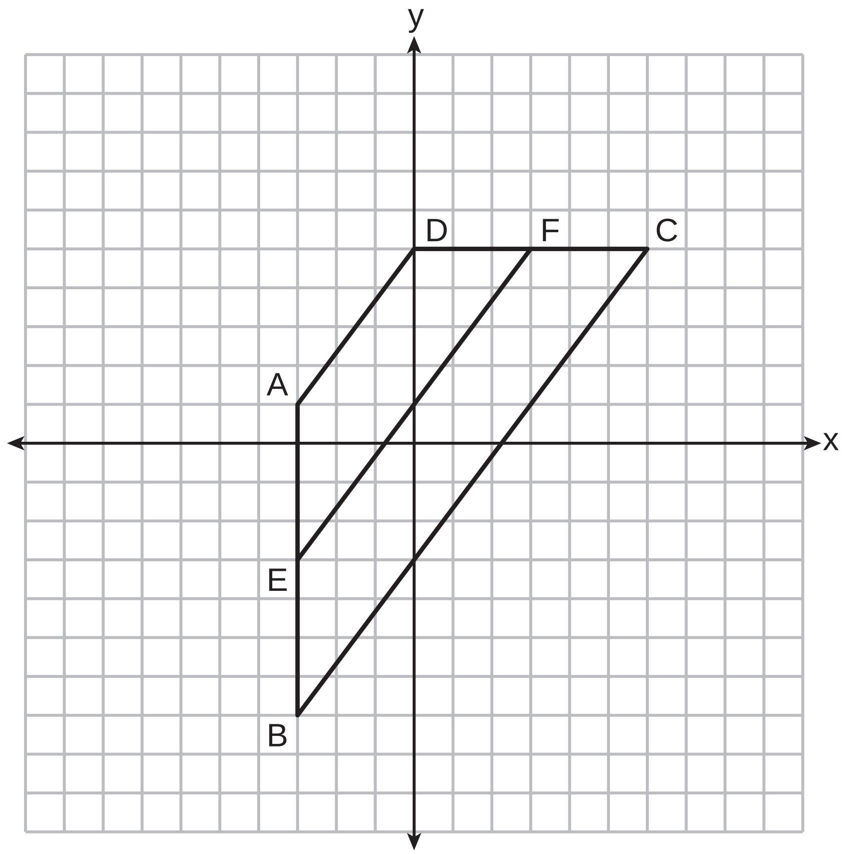
Score 2: The student proved *ABCD* is a trapezoid.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$AD = \frac{1}{3} BC$

Question 35 is continued on the next page.

Score 1: The student did not show work to determine the slopes of $\overline{AD}$, $\overline{BC}$, and $\overline{EF}$, but wrote a correct concluding statement.

Question 35 continued.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$\overline{AD}$ has a slope of $\frac{4}{3}$

$\overline{EF}$ has a slope of $\frac{8}{6} = \frac{4}{3}$

$\overline{BC}$ has a slope of $\frac{12}{9} = \frac{4}{3}$

they are parallel because they all have the same slope

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

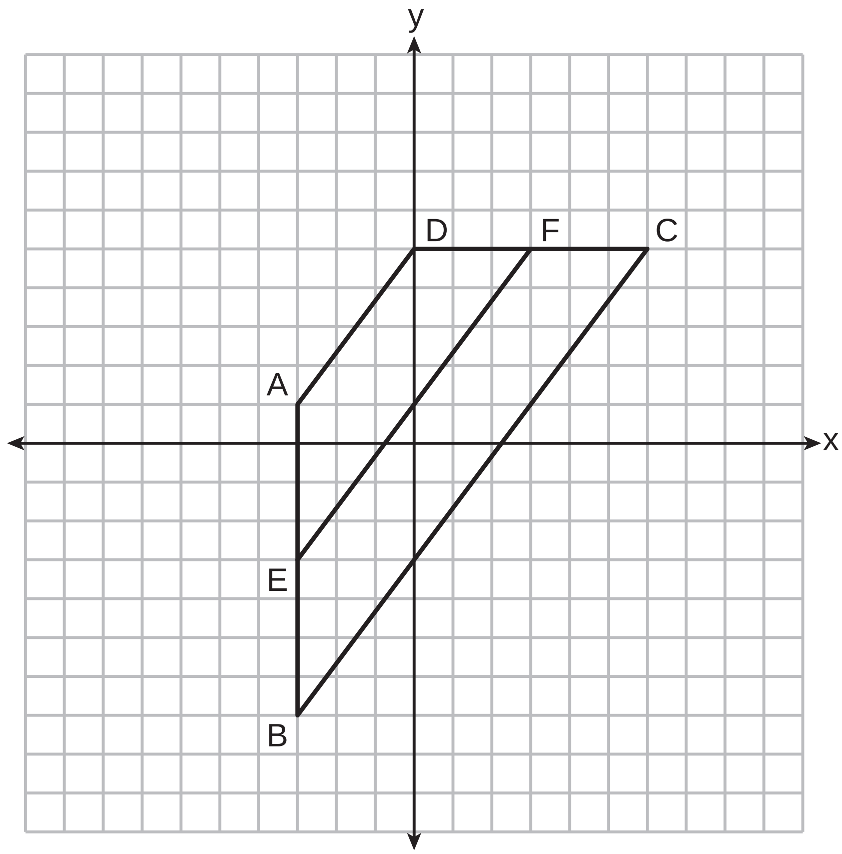
$7 = \frac{1}{2}(4 + 13)$

$7 = \frac{1}{2}(17)$

$7 = 8.5$

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$m\overline{AD} = \frac{5-1}{0-^-3} = \frac{4}{3}$ $m\overline{BC} = \frac{5-^-7}{6-^-3} = \frac{12}{9} = \frac{4}{3}$

ABCD is a trapezoid.

Question 35 is continued on the next page.

Score 1: The student wrote an incomplete concluding statement when proving *ABCD* is a trapezoid.

Question 35 continued.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

Since they are in the middle
they are still Parallel.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

Yes

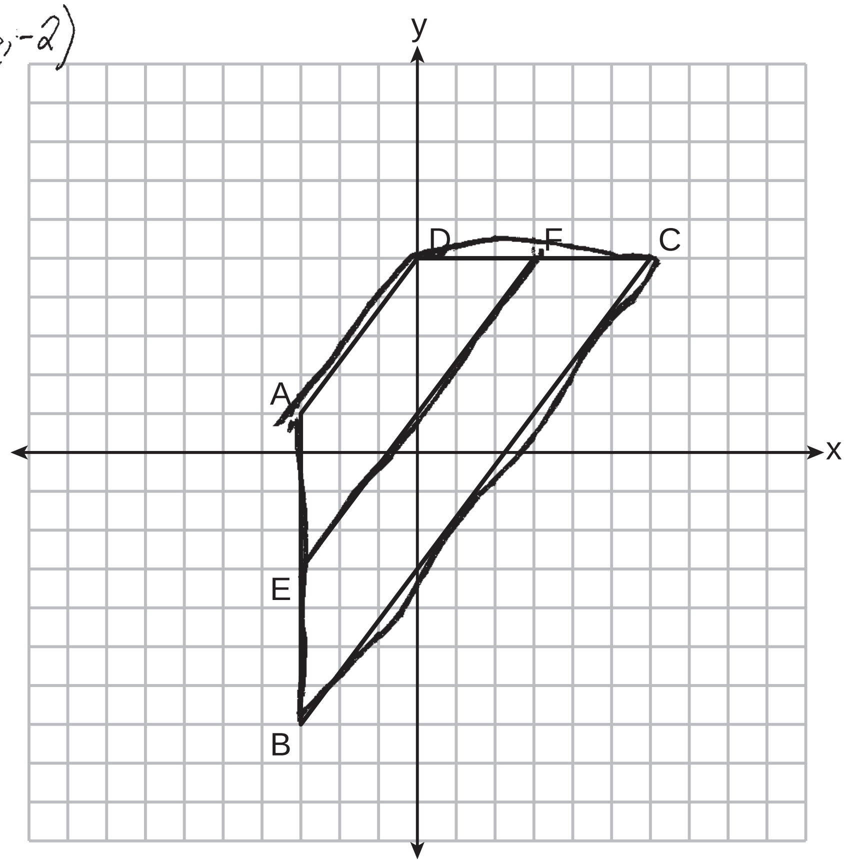
35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment EF is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.

$\overline{EF}\ \frac{1}{2}(-3, 6+3, -2)$

$\frac{0,4}{2}$

$(0,2)$

EF



Prove *ABCD* is a trapezoid.

ABCD is a Trapezoid because when intersected by line $\overline{EF}$ it creates a smaller trapezoid ADFE showing that the original figure ABCD is also a trapezoid.

Question 35 is continued on the next page.

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

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

$\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$ because a trapezoid only has one pair of // lines and those lines are $\overline{AD}$ and $\overline{BC}$. $\overline{EF}$ is // to both because $\overline{EF}$ is equal to $\frac{1}{2}$ of AD + BC which proves the lines being parallel to each other.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

E(-3,-3)
F(3, 5) → 0, 2 = EF

Yes it's equal

A(-3, 1)
D(0, 5) (-3,6) = AD → (-3,6)

+ +

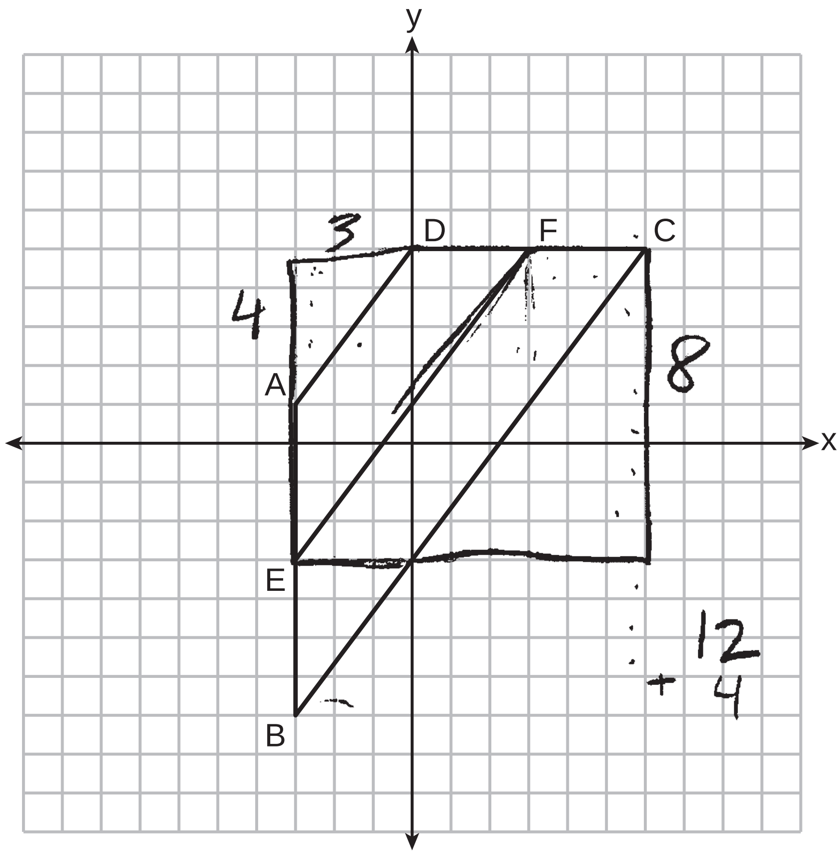
B(-3,-7)
C(6, 5) (3,-2) BC → (3,-2)

EF = $\frac{1}{2}$(0,4)

(0,2)

Question 35

35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment EF is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove *ABCD* is a trapezoid.

$\overline{DA} \parallel \overline{BC}$ trapezoid only needs 1 sets of parrellel sides

Question 35 is continued on the next page.

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

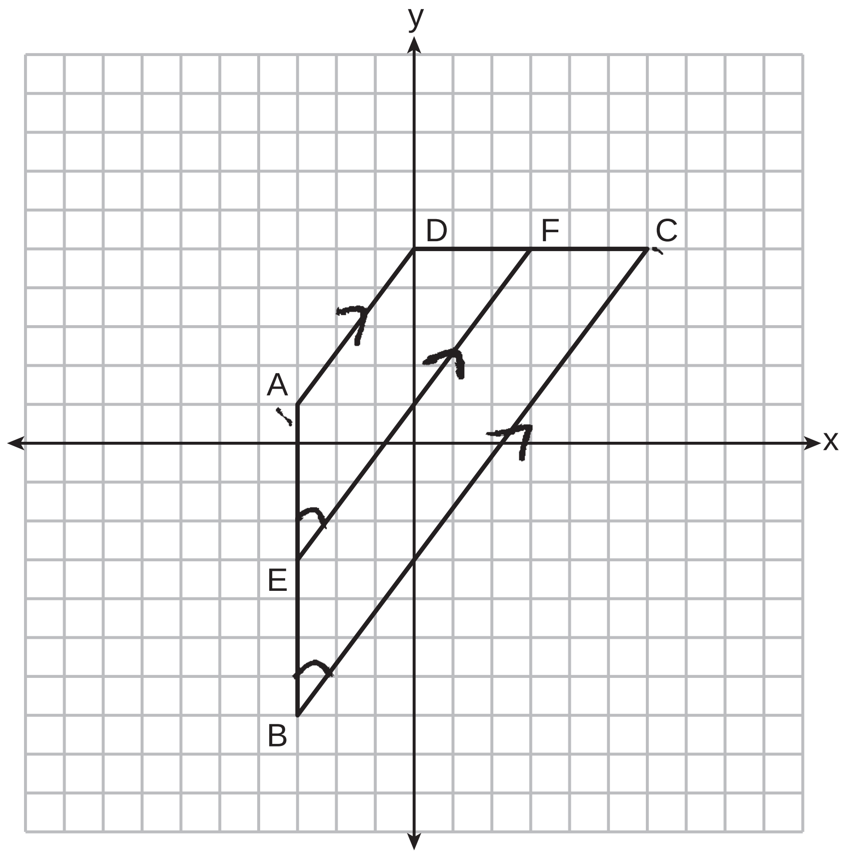
Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

each side has 3 cubic units between them and don't cross over making them parrellel

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

yes EF's length is 8 cubic units and $\overline{CB}$ is 12 and DA is 4 12+4=16 half of 16 is 8 the length of $\overline{EF}$ is 8 ∴ $\overline{EF}$ is half of $\overline{AD}$+$\overline{BC}$

35 Quadrilateral $ABCD$ is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment EF is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.



Prove $ABCD$ is a trapezoid.

Statements	Reasons
① $\overline{AD} \parallel \overline{BC} \parallel \overline{EF}$	① they never run into each other
② $\angle AEFD \cong \angle CBEF$	② $\parallel$ lines have $\cong$ angles
③ Quad ABCD is a Trapezoid	③ cpctc

Question 35 is continued on the next page.

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

Question 35 continued.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

They never run into each other

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

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

Regents Examination in Geometry – JANUARY 2026

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

(Use for the January 2026 exam only.)

Raw Score	Scale Score	Performance Level
80	**100**	5
79	**99**	5
78	**97**	5
77	**96**	5
76	**94**	5
75	**93**	5
74	**92**	5
73	**91**	5
72	**89**	5
71	**88**	5
70	**87**	5
69	**87**	5
68	**86**	5
67	**85**	5
66	**84**	4
65	**83**	4
64	**83**	4
63	**82**	4
62	**81**	4
61	**81**	4
60	**80**	4
59	**79**	3
58	**79**	3
57	**78**	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	**74**	3
48	**73**	3
47	**73**	3
46	**72**	3
45	**71**	3
44	**71**	3
43	**70**	3
42	**70**	3
41	**69**	3
40	**68**	3
39	**68**	3
38	**67**	3
37	**66**	3
36	**66**	3
35	**65**	3
34	**64**	2
33	**63**	2
32	**63**	2
31	**62**	2
30	**61**	2
29	**60**	2
28	**59**	2
27	**58**	2

Raw Score	Scale Score	Performance Level
26	**57**	2
25	**56**	2
24	**55**	2
23	**54**	1
22	**53**	1
21	**52**	1
20	**50**	1
19	**49**	1
18	**48**	1
17	**46**	1
16	**45**	1
15	**43**	1
14	**41**	1
13	**39**	1
12	**37**	1
11	**35**	1
10	**33**	1
9	**30**	1
8	**28**	1
7	**25**	1
6	**22**	1
5	**19**	1
4	**16**	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.