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

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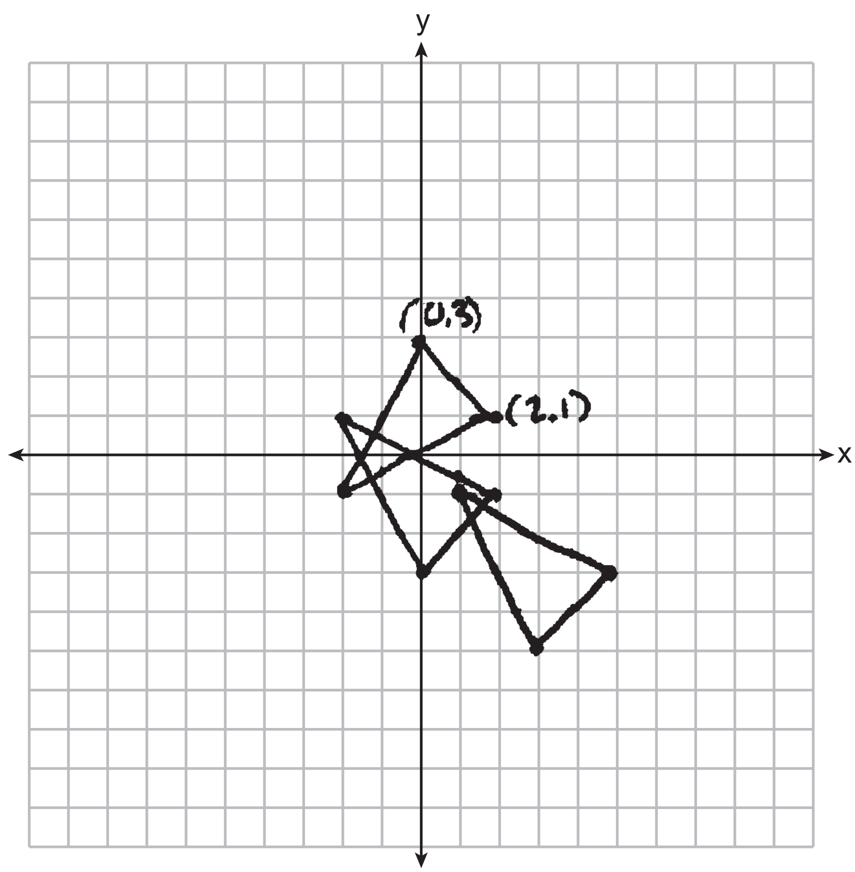
Question 25

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).

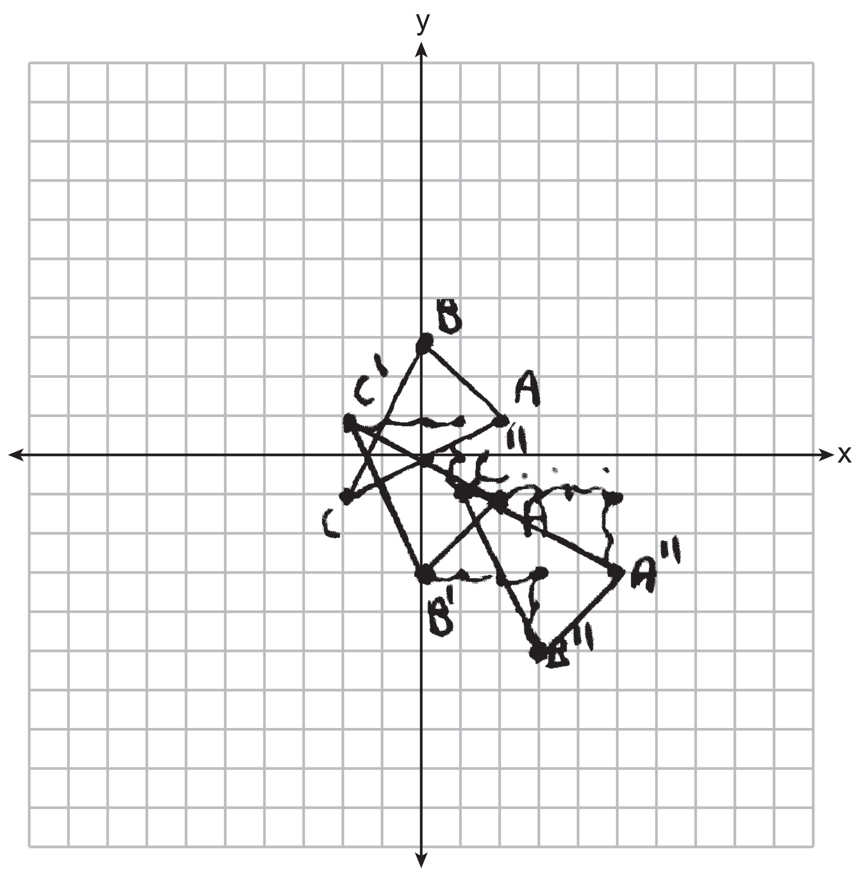
Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[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

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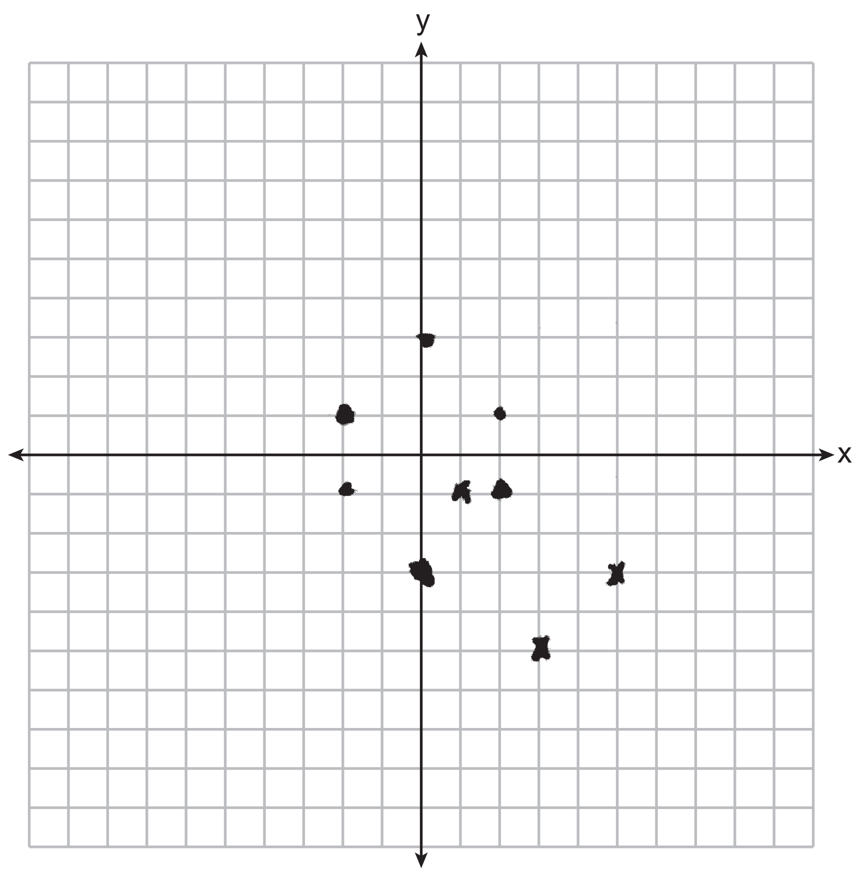
Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

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

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



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Question 25

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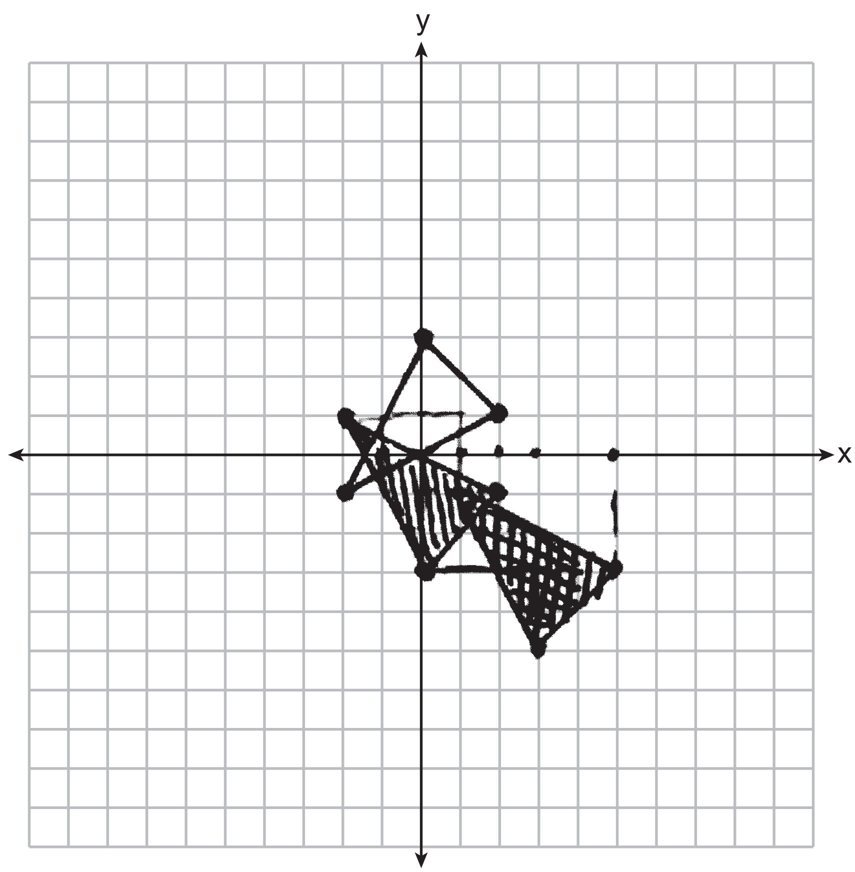
Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the *x*-axis followed by a translation of 3 units to the right and 2 units down.

[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.

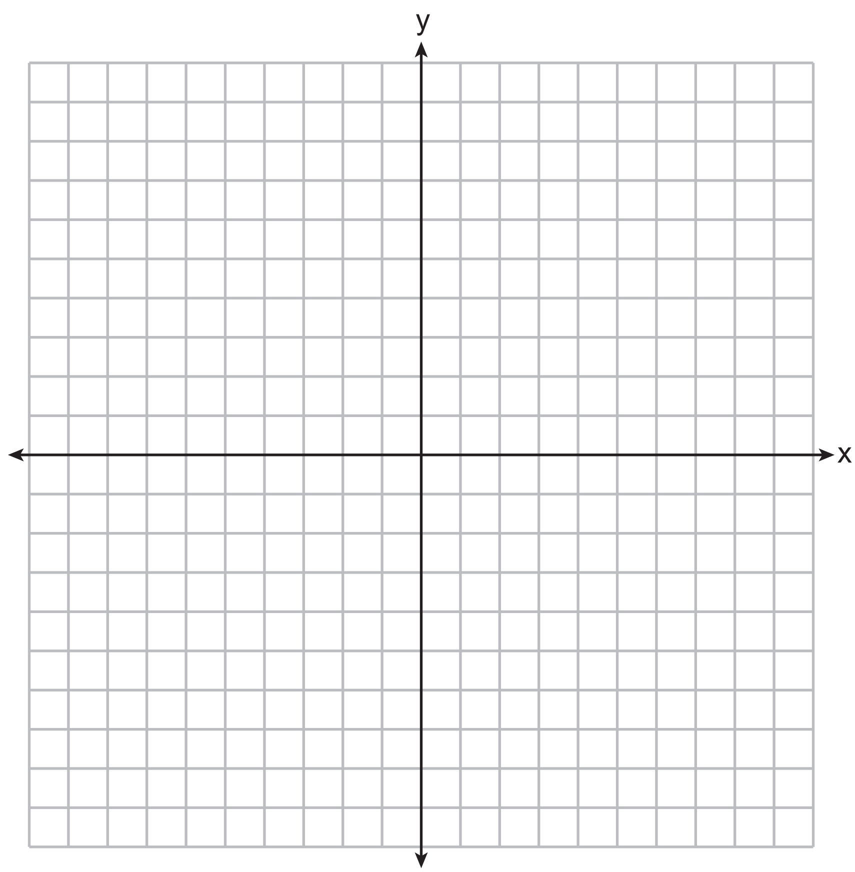
[The use of the set of axes below is optional.]

reflect x axis Translate right 3 down 2

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

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

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



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

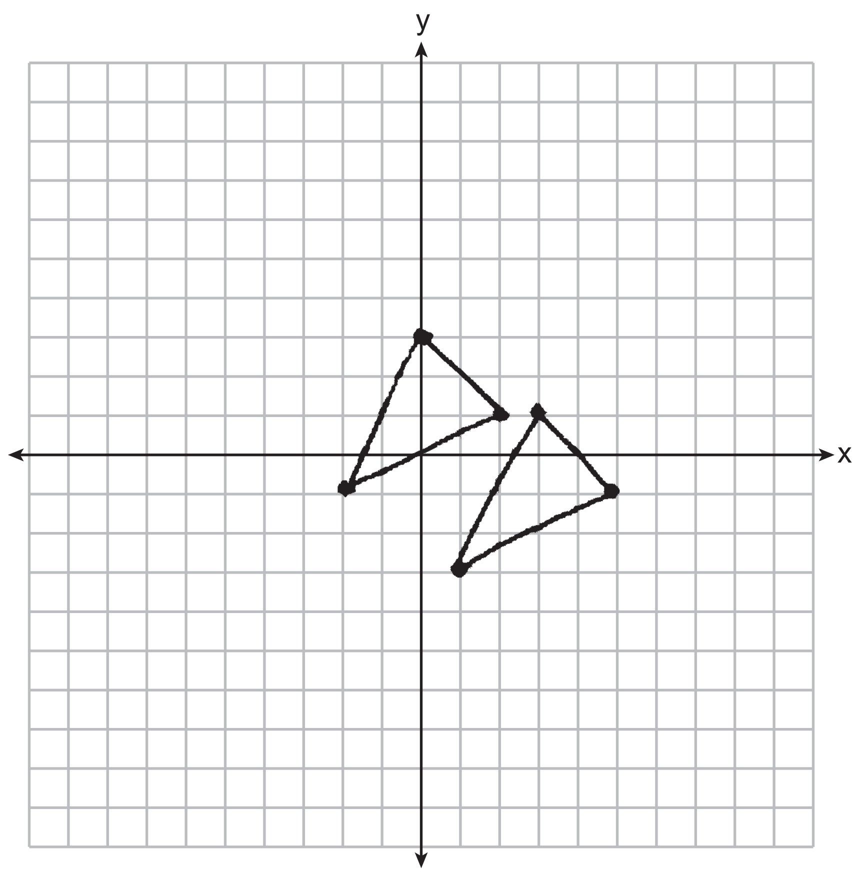
Question 25

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.

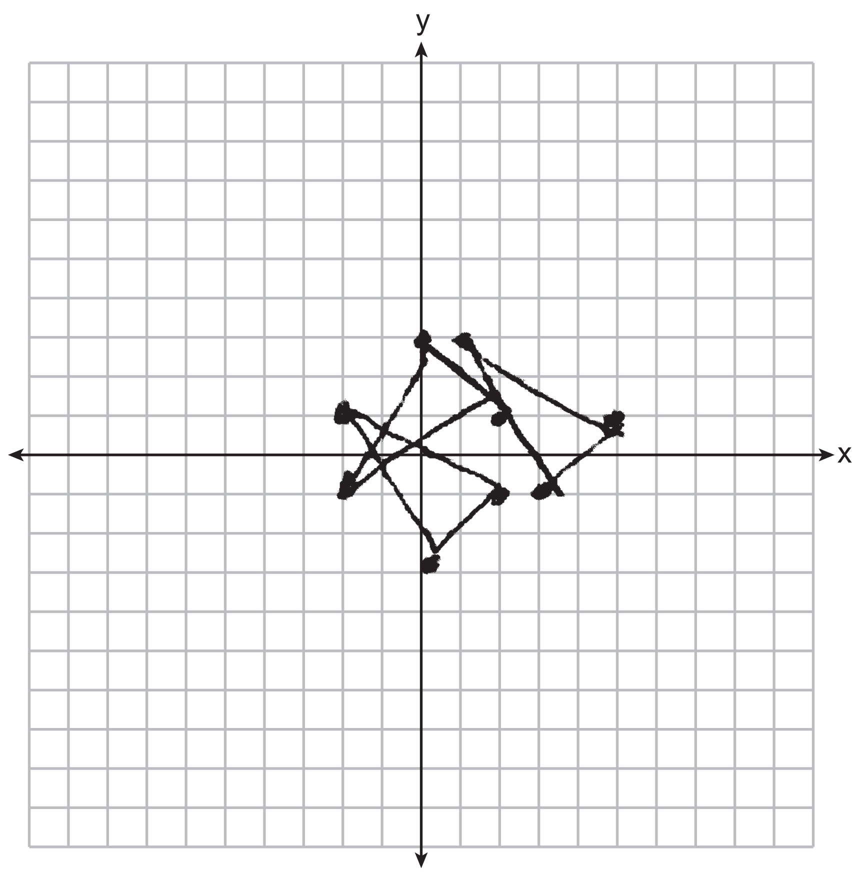
Question 25

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.

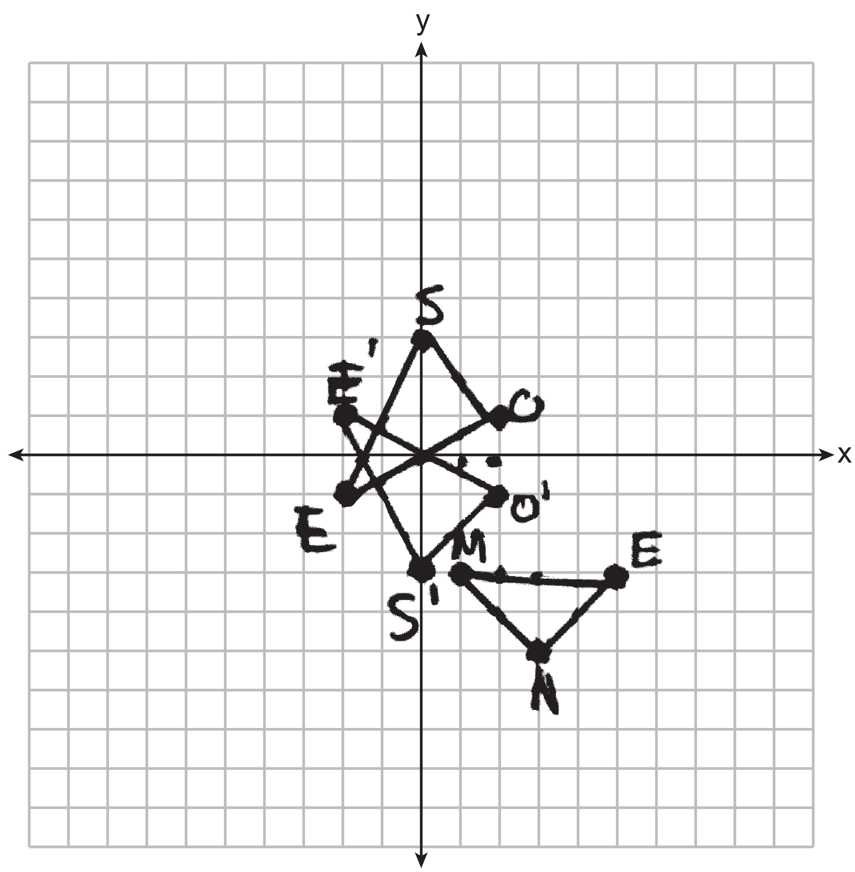
Question 25

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).

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

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

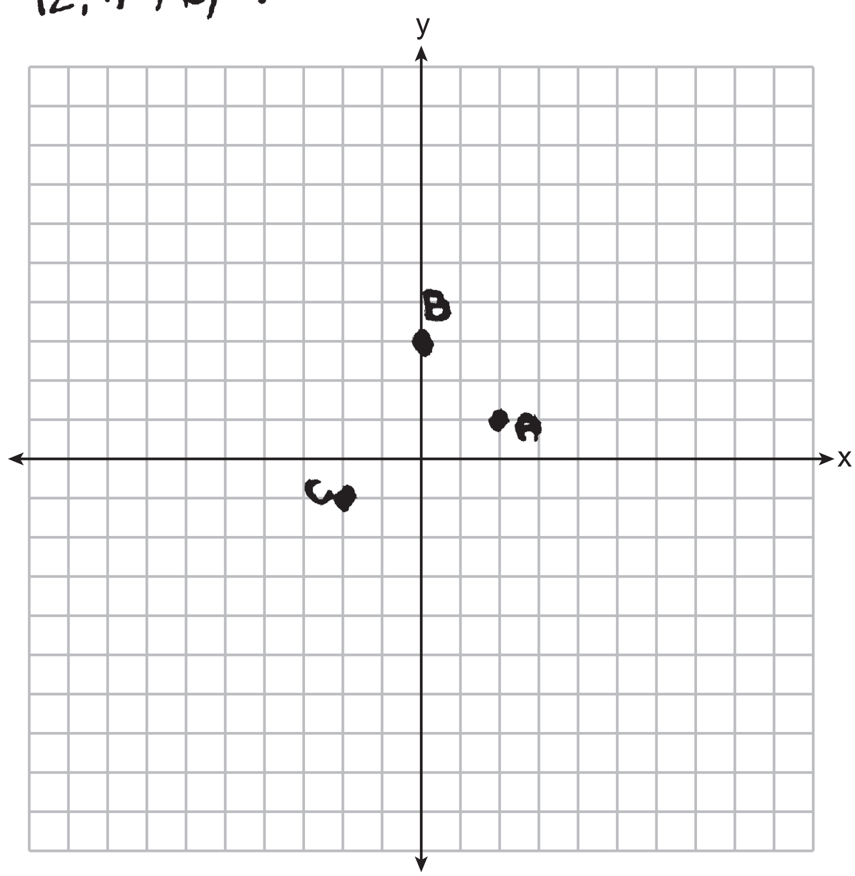
$(0,3) \rightarrow (0,-3) \rightarrow (3,-5)$

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

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

3 right 2 down

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



Score 1: The student translated one point incorrectly.

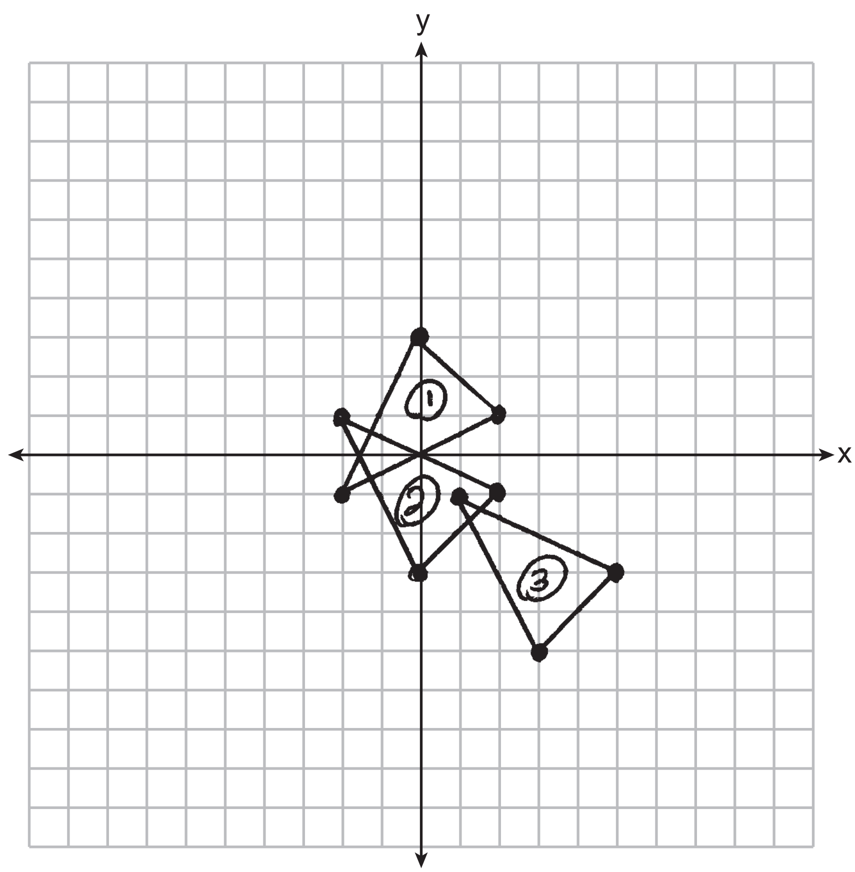
Question 25

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.]

Δ3



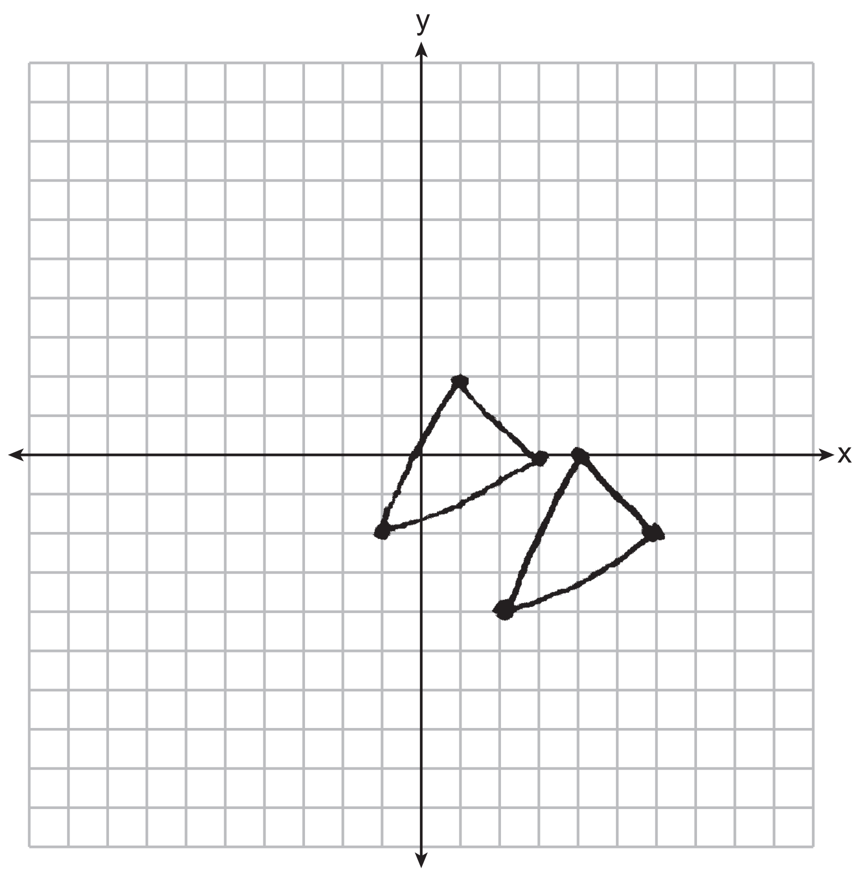
Score 1: The student correctly graphed the image of the triangle, but did not state the coordinates of the vertices.

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.

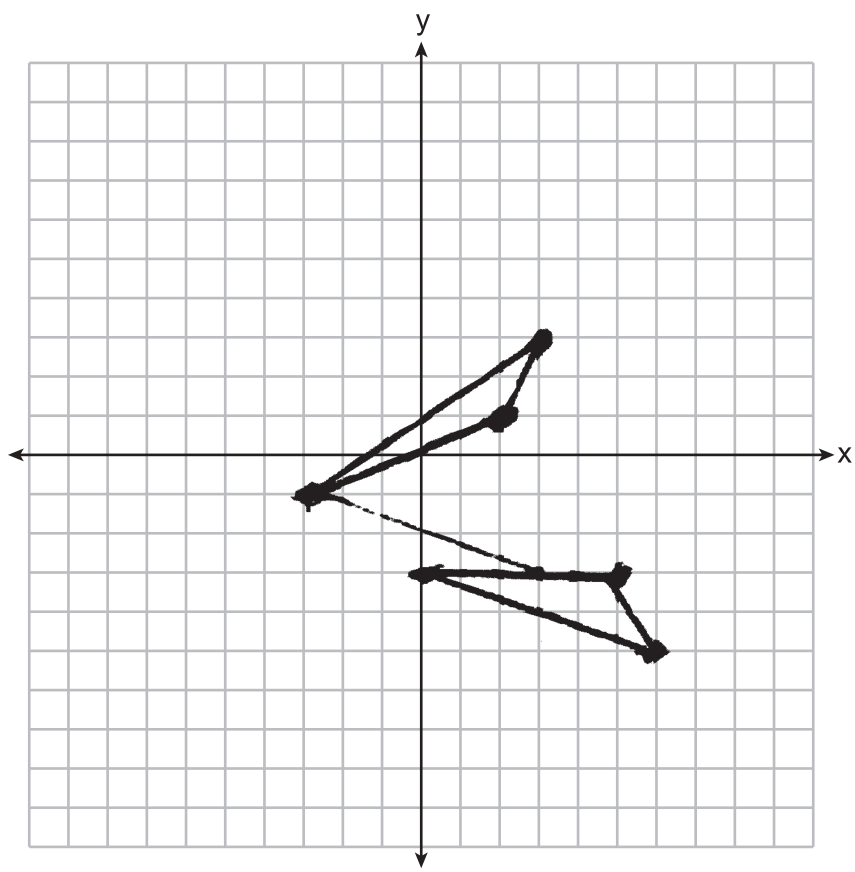
Question 25

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.

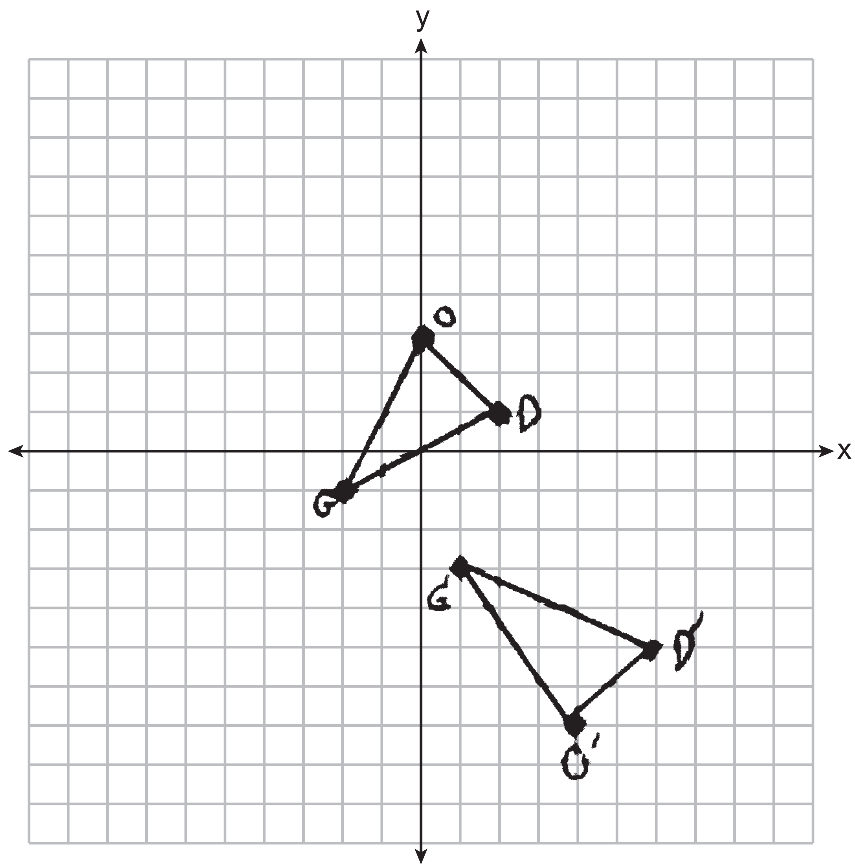
Question 25

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.

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*.

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

$A=78.53\ldots$ 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 $= \pi r^2 h$

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

$V = 1178.097245$

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

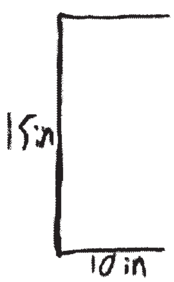
$x = 27.21$

Weight: 27 pounds

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

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*.



$V = Bh$

$10^2 \cdot \pi = 314.1593$

$314.1593 \cdot 15 = 4712.389$

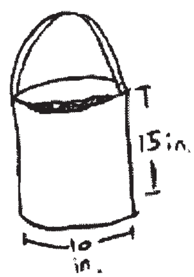
$4712.389 \cdot 0.0231 = 108.8562$

$W = 109$ LBs when full

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

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*.



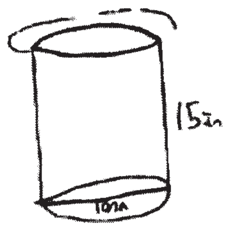
$V = \pi 5^2 \cdot 15$
$V = 1178.097245$

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*.



$V = 1178 in^3$

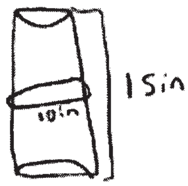
$W = 27 lbs.$

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*.



$V = Bh$

$V = 150 \cdot 15$

$V = 2250 \text{ in}$

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

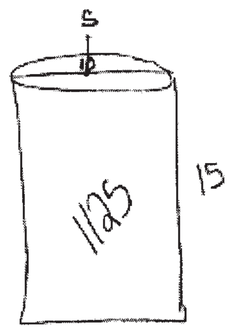
Score 0: The student did not show enough correct work to receive any credit.

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*.



$V = 150(15)$

$V = 2250$

$2250 \div 0.0231$

$= 97402.5974$

$\boxed{= 97403}$

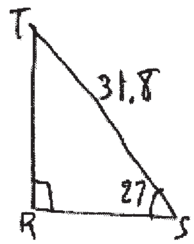
$\boxed{97403 \text{ pounds}}$

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*.



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

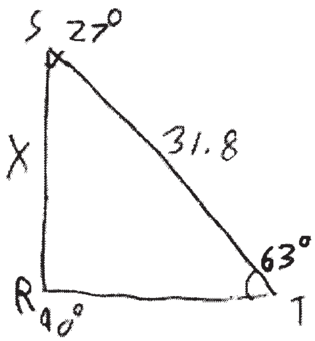
$\underline{SR = 28.3}$

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

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

$\cdot 31.8$

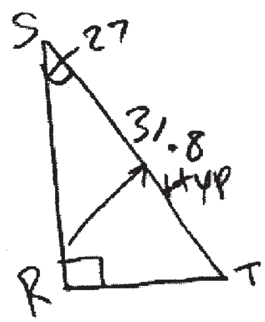
$28.3 = x$

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*.



Soncahtoa

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

$31.8 \sin 27 = x$

$x = 14.43\ldots$

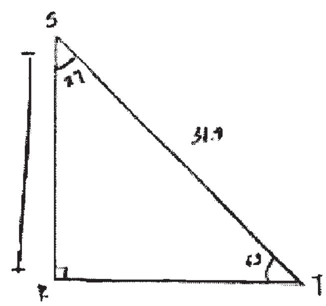
$= 14.4$

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

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

$SR \approx 62.411$

$SR = 62.4$

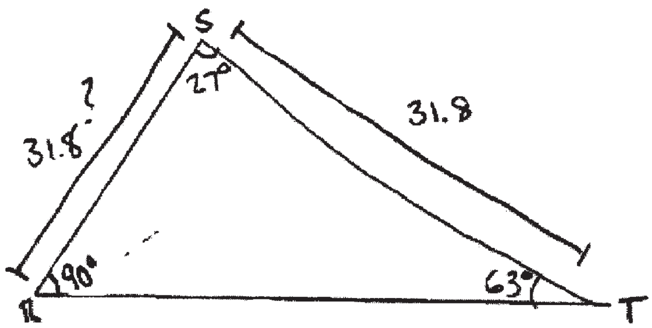
Score 1: The student used an incorrect trigonometric equation, but found an appropriate answer.

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*.

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



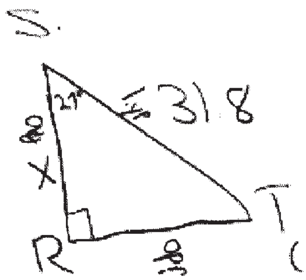
$X = 31.8$

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

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

$x = 30.412$

$x = 30.4$

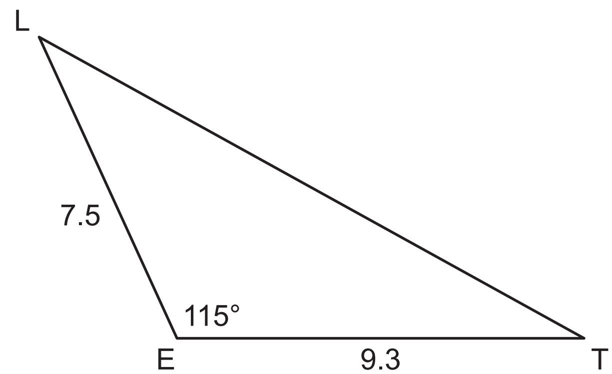
$x = SR$

$x = 30.4$

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*.

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

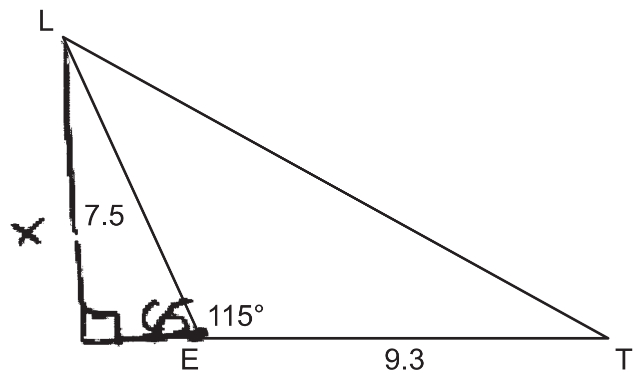
$A = 31.60748407...$

$\boxed{A \approx 31.6}$

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*.

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

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

$$x = 6.797308403$$

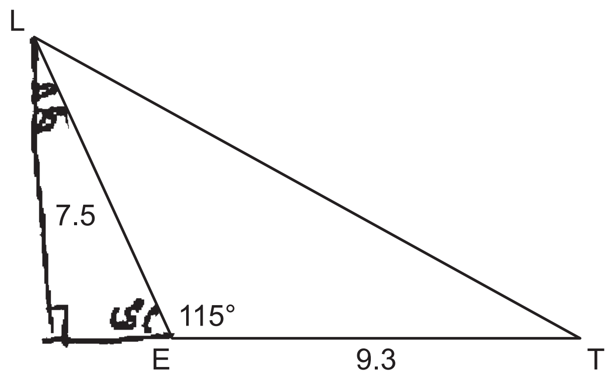
$$A = \frac{1}{2}(6.797308403)(9.3)$$

Area of $\triangle LET = 31.6$

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*.

$\sin(25) = 0.4226182617$

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

$opp = \downarrow \times 7.5$

$opp_1 = 3.169636963$

$\sin(65) = 0.906307787$

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

$opp = \times 7.5$

$opp_2 = 6.797308403$

$\frac{bh}{2}$

$b = 9.3 + 3.169636963$

$b = 12.46963696$

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

$42.37998406 =$

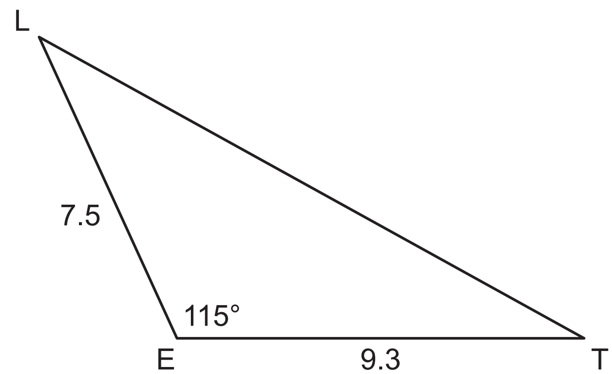
$\frac{opp_1 \cdot opp_2}{2} = \frac{21.5449996}{2} = 10.7724998$

$42.37998406 - 10.77249998 = 31.6074840 \approx 31.6$

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

Question 28

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



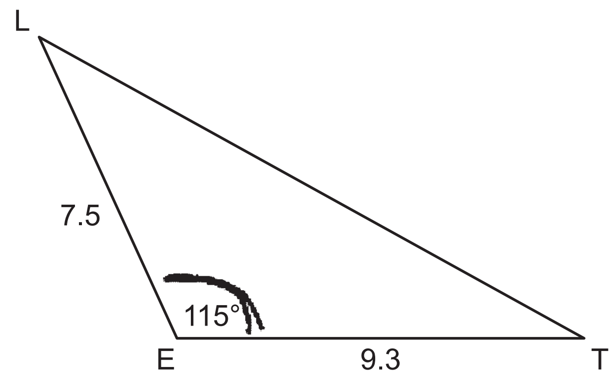
Determine and state the area of $\triangle LET$, to the *nearest tenth*.

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

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*.

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

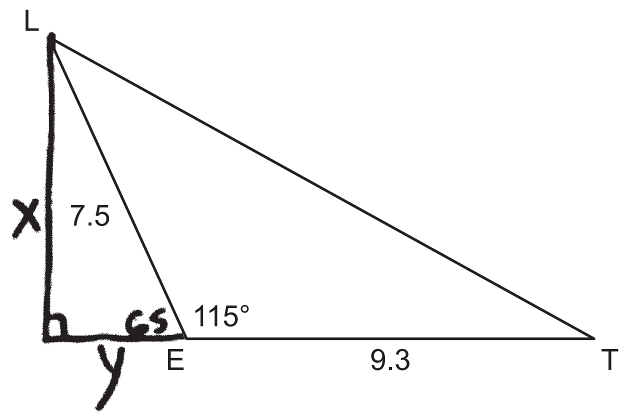
$\frac{(7.5 \times 9.3)}{2} = 34.875 \approx \boxed{34.9}$

∴ 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*.

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

$x = 6.797$

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

$y = 3.1696$

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

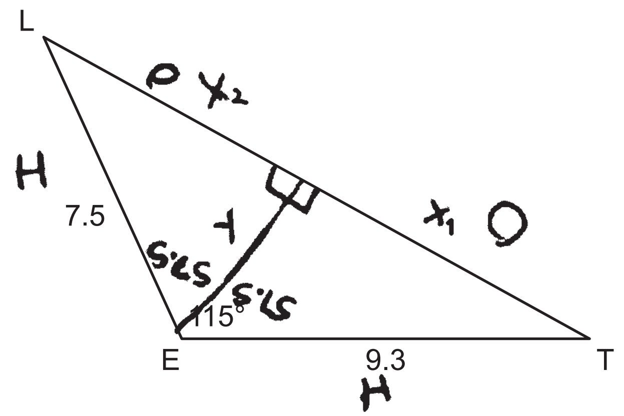
$A = \frac{1}{2}(6.7973)(9.3 + 3.1696)$

$A = 42.3798$

$\boxed{A = 42.4}$

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

28 In △*LET* below, *LE* = 7.5, *ET* = 9.3, and m∠*LET* = 115°.



Determine and state the area of △*LET*, to the *nearest tenth*.

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

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

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

$A =$

$x_1 = 9.3 \sin 57.5$

$y = 4.9968860358$

$x_1 = 7.843540446$

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

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

$x_2 = 7.5 \sin 57.5$

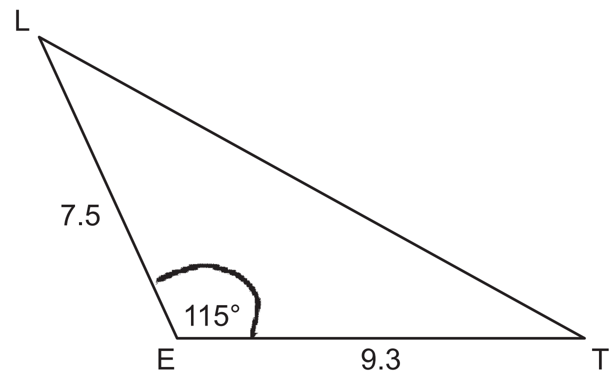
$x_2 = 6.32543844$

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

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

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

x

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

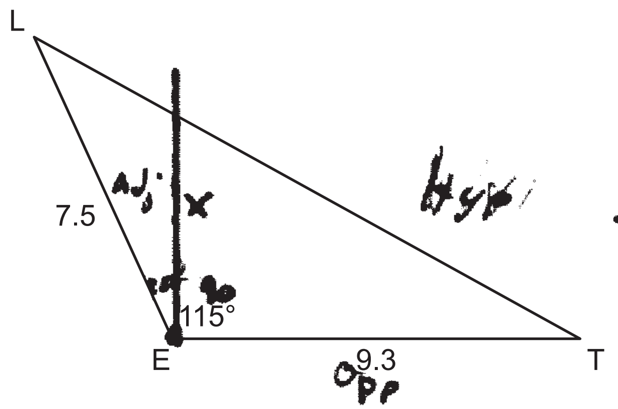
$x = -1.7294110$

$\triangle LET$
-1.7

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 $m\angle LET = 115°$.



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

$\text{Tan } 90 = \frac{9.3}{x}(x)$

$\frac{\text{Tan } 90\, x}{\text{Tan } 90} = \frac{9.3}{\text{Tan } 90}$

$x = 5.806250047$

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

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

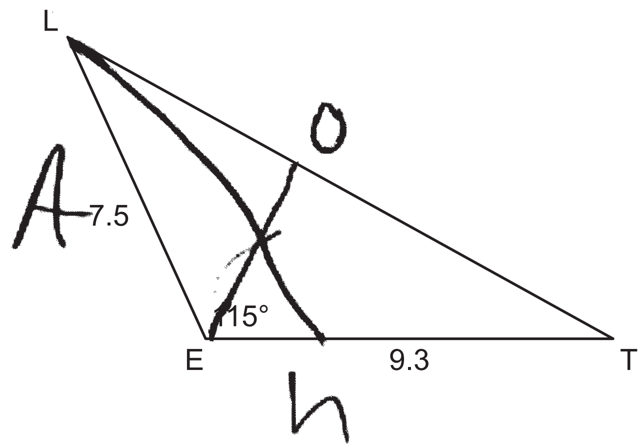
$A = \frac{1}{2}(9.3)(5.806250047)$

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

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*.

$9.3 \cdot 7.5 = 69.75$

$\cancel{\frac{\sin 115}{1} = \frac{9.82}{x}}$

$x = 18.589993$

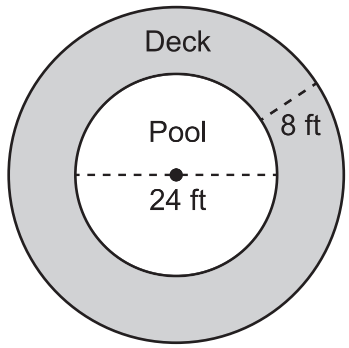
$115 \sin(9.3)$

$\boxed{A = 172.8}$

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.



24
$+16$
$40 = \text{diameter}$
$20 = r$

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

$A = 20^2\pi$
$A = 400\pi$
$A = 1256.63706 \text{ ft}^2$

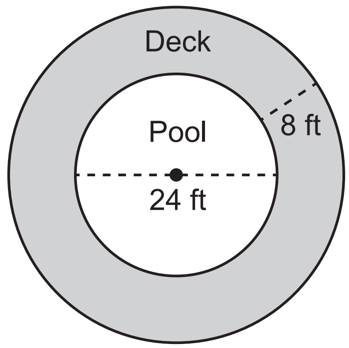
$A = 12^2\pi$
$A = 144\pi$
452.38934 ft^2

1256.637
$- 452.389$
$= 804.24772 \text{ ft}^2$

804 ft^2

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.



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

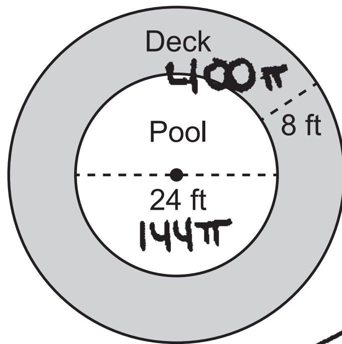
Score 2: The student gave a complete and correct response.

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.

$A = \pi 12^2$

$A = \pi 144$



$A = \pi 20^2$

$A = 400\pi$

deck: 256π

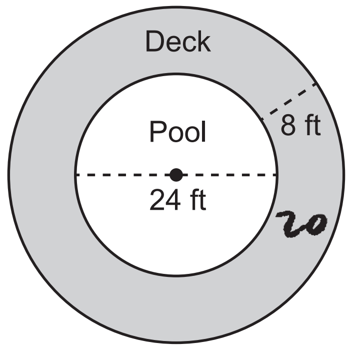
Determine and state the number of square feet of the deck, to the *nearest square foot*.

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

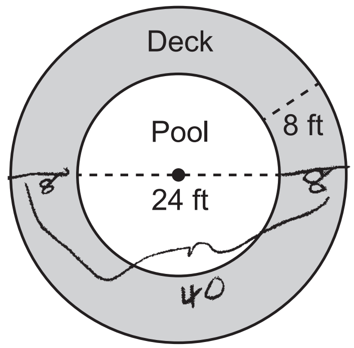
$400\pi - 144\pi = 256\pi$

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*.

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

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

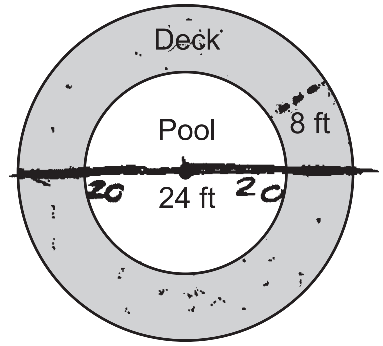
Deck $= 3216.990878$

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

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*.

$\pi(r)^2$

$\pi(20)^2$

$\pi 400$

$(12)^2\pi$

$\pi 144$

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

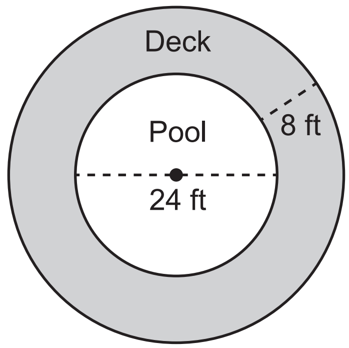
~~256cm~~

$\boxed{256\pi}$

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*.

$24 - 8 = 16$

$A = \pi 16^2$

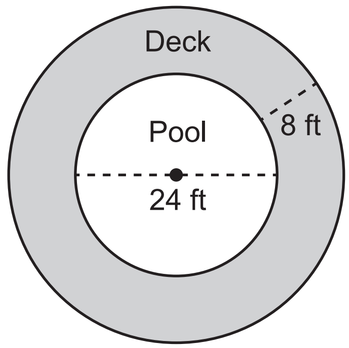
$A = 804.248$

$\boxed{A = 804}$

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

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*.

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

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

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

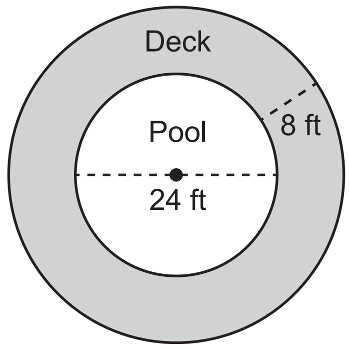
$\downarrow$

$402 ft^2$

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*.

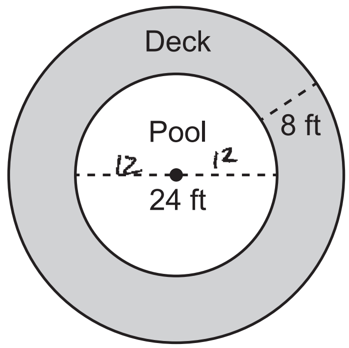
$\pi 12^2 \approx 452$

$452/3 = 151 ft^2$

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*.

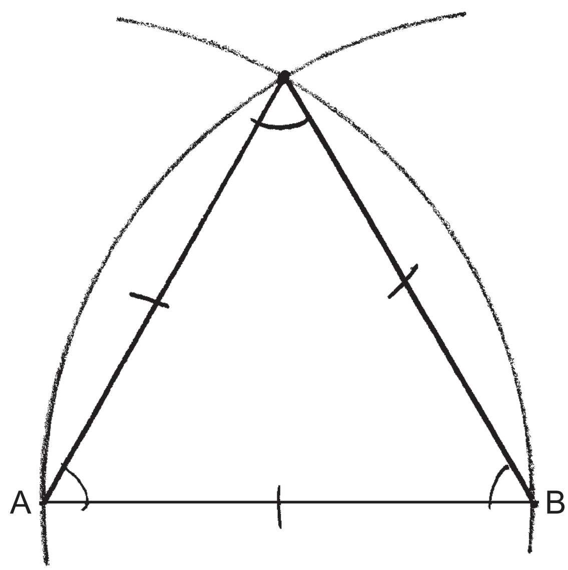
$$A = \pi r^2$$
$$= \pi 12^2$$
$$= 144\pi$$
$$A = 452.3893$$
$$\boxed{A = 452 \text{ ft}^2}$$

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.

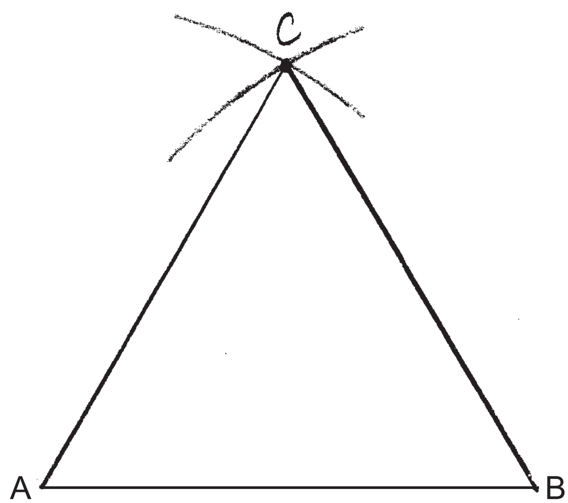
[Leave all construction marks.]



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

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.]

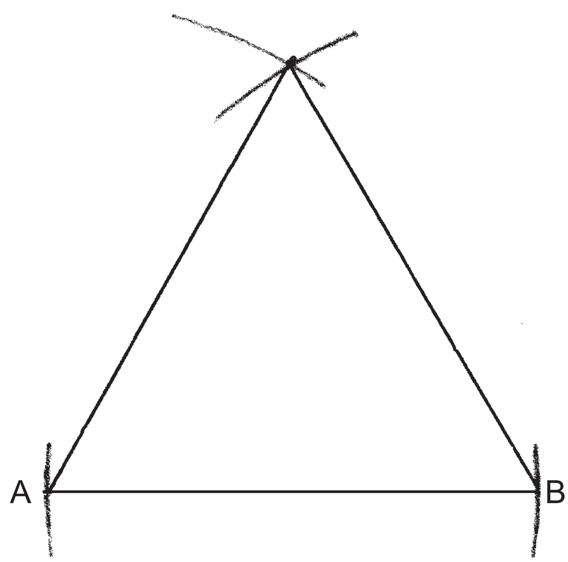


Score 2: The student gave a complete and correct response.

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.]

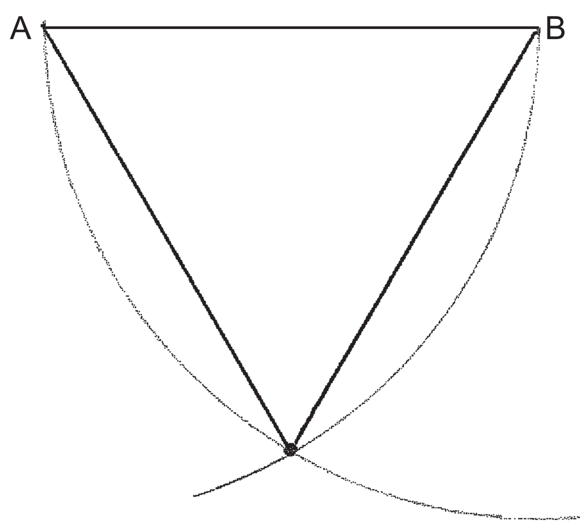


Score 2: The student gave a complete and correct response.

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.]

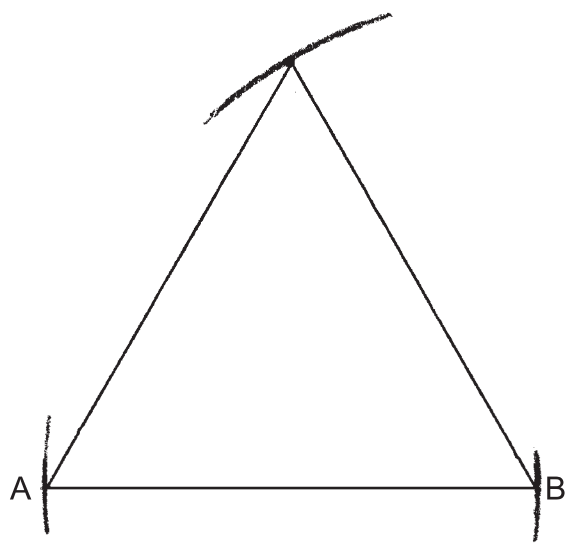


Score 2: The student gave a complete and correct response.

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.]

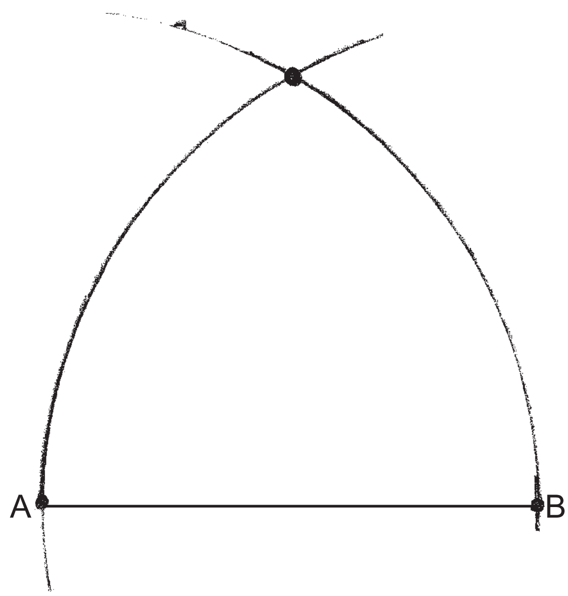


Score 1: The student was missing one construction arc at the third vertex of the triangle.

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.]

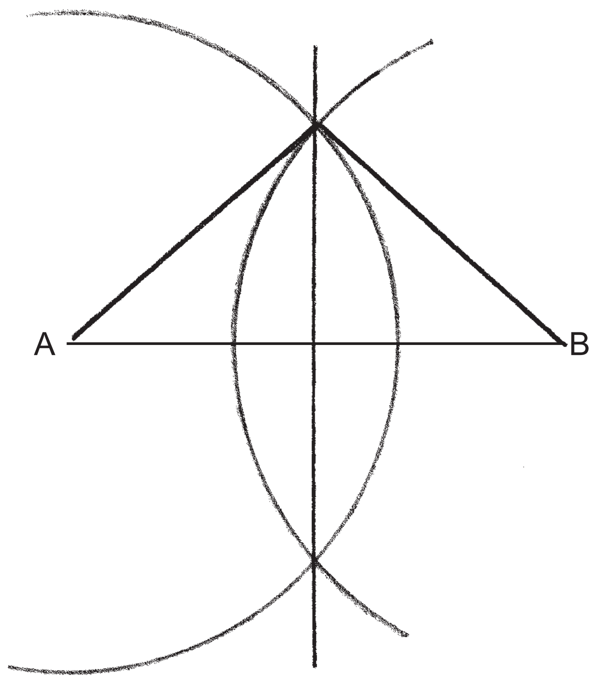


Score 1: The student constructed all appropriate arcs, but did not draw the triangle.

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.]

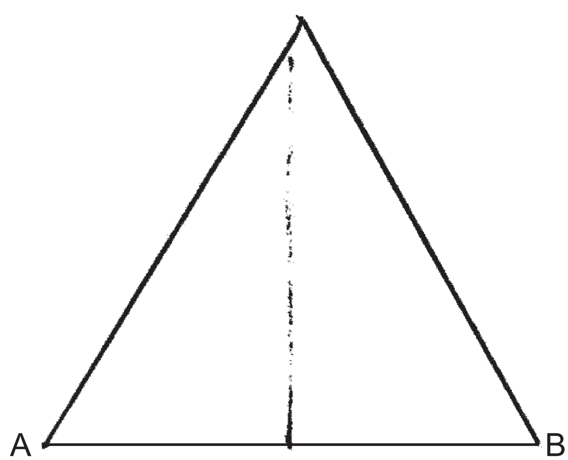


Score 0: The student did not show enough correct relevant work to receive any credit.

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.]

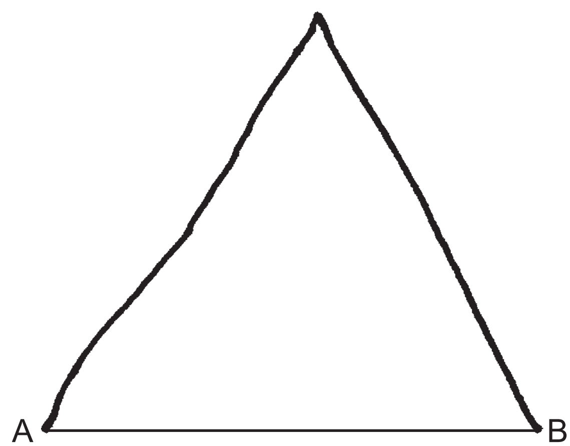


Score 0: The student made a drawing that was not an appropriate construction.

Question 30

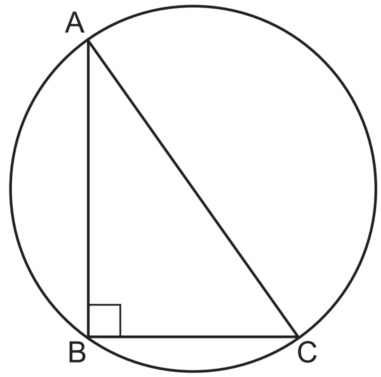
30 Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.

[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*.



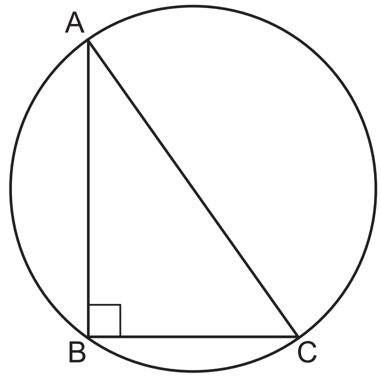
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ is a diameter because $\angle ABC$ is an inscribed angle and it is 90°. That means that the arc that the $\angle$ opens up to is x2 the amount of the $\angle$ $90 \times 2 = 180$ 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*.



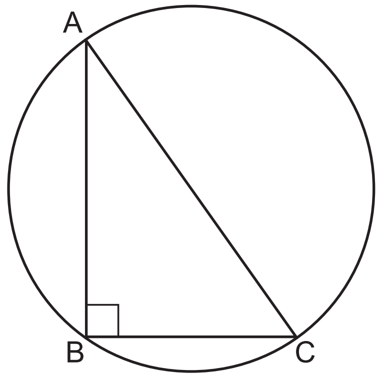
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ must be a diameter because in order for $\angle B$ to be a right angle that is touching the edge of the circle, $\overset{\frown}{AC}$ has to be 180°. In order for $\overset{\frown}{AC}$ 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*.



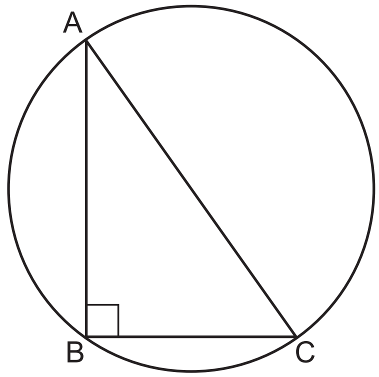
Explain why $\overline{AC}$ must be a diameter of the circle.

$\measuredangle B$ is a $90°$ $\measuredangle$ which means that
the arc it opens up to $\widehat{AC}$ is 2x
the $\measuredangle$ so $\widehat{AC}$ 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.



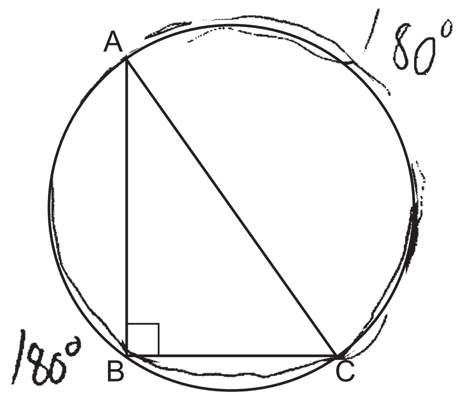
Explain why $\overline{AC}$ must be a diameter of the circle.

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.



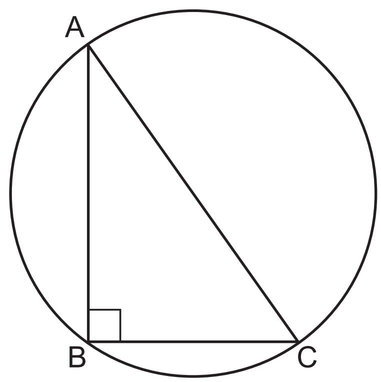
Explain why $\overline{AC}$ must be a diameter of the circle.

Since ∡ABC is 90° and has its vertex on the edge of the circle, $\widehat{AC}$ is 180° since the angle is ½ 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*.



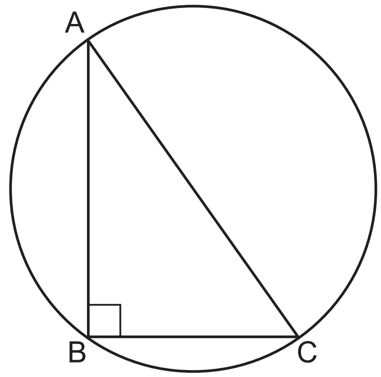
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ 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.



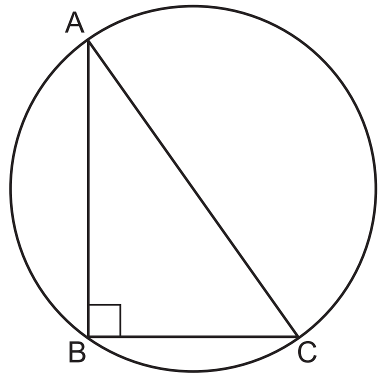
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ 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.



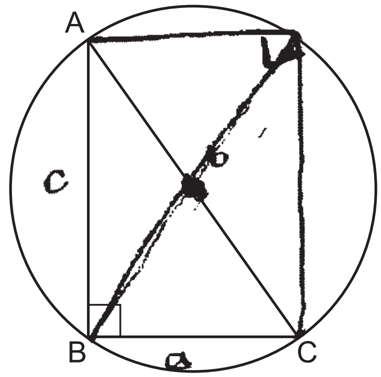
Explain why $\overline{AC}$ must be a diameter of the circle.

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.



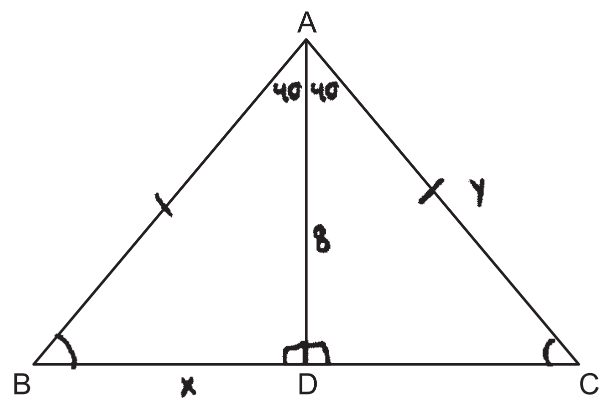
Explain why $\overline{AC}$ must be a diameter of the circle.

$\overline{AC}$ must be the diameter because the chords form a right triangle meaning that if you duplicated the triangle, a perfect $\triangle$ 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

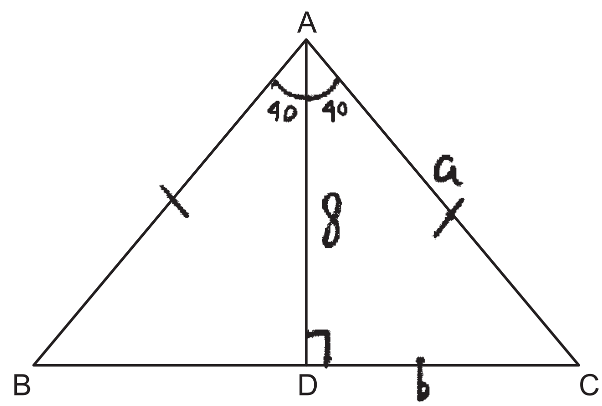
+

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*.

$\cos(CAD) = \frac{8}{a}$

$\cos(40) = \frac{8}{a}$

$\frac{\cos(40)}{8} = \frac{1}{a}$

$\frac{8}{\cos(40)} = a$

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

$64 + b^2 = 109.1$

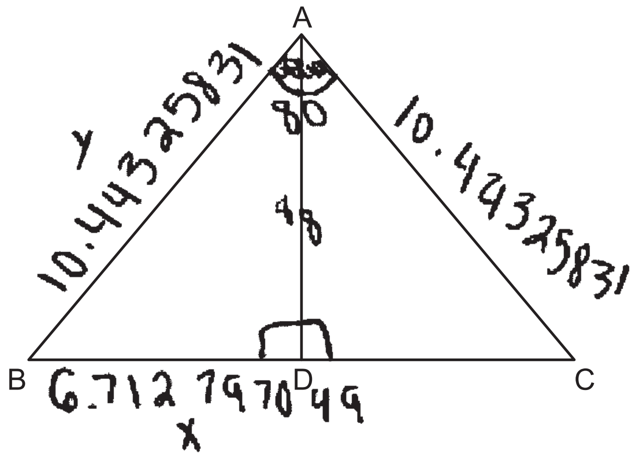
$b^2 = 45.1$

$b = \sqrt{45.1}$

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

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

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*.

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

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

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

$x = 6.712797049$

$y = 10.44325831$

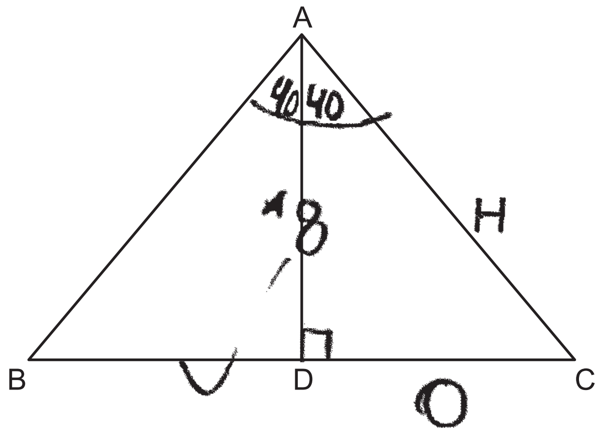
$2(6.712797049) + 2(10.44325831) =$

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

$*2$

13.42559411

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

$H = 10.44325831$

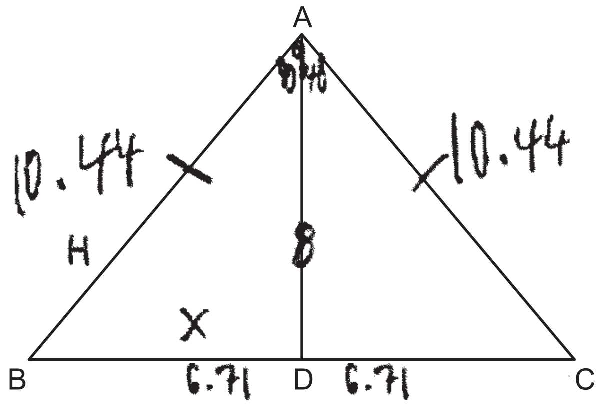
$*2$

20.8865166

$P = 34.3$

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*.

$\frac{\cos 40}{1} = \frac{8}{H}$

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

$H = 10.44 \approx 10.4$

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

$X = 6.71 \approx 6.7$

$2(6.7) = $ Whole side

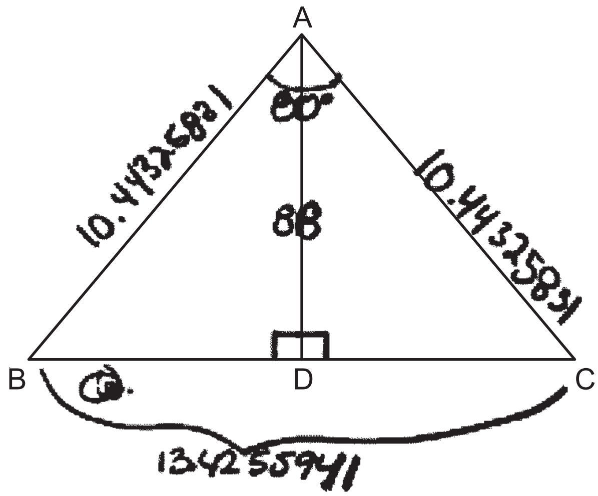
$10.4 + 10.4 + 13.4$

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

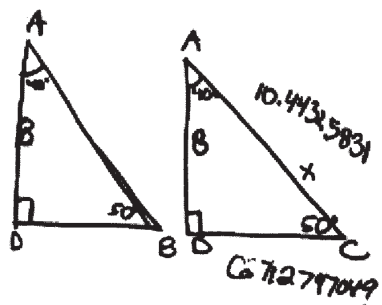
Score 3: The student made a rounding error.

Question 32

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



If m∠*BAC* = 80° and *AD* = 8, determine and state the perimeter of △*ABC*, to the *nearest tenth*.



180 − 130 = 50

SOH
CAH
TOA

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

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

$\tan 50 = \frac{8}{DC}$

$DC = \frac{8}{\tan 50}$

$DC = 6.712797049$

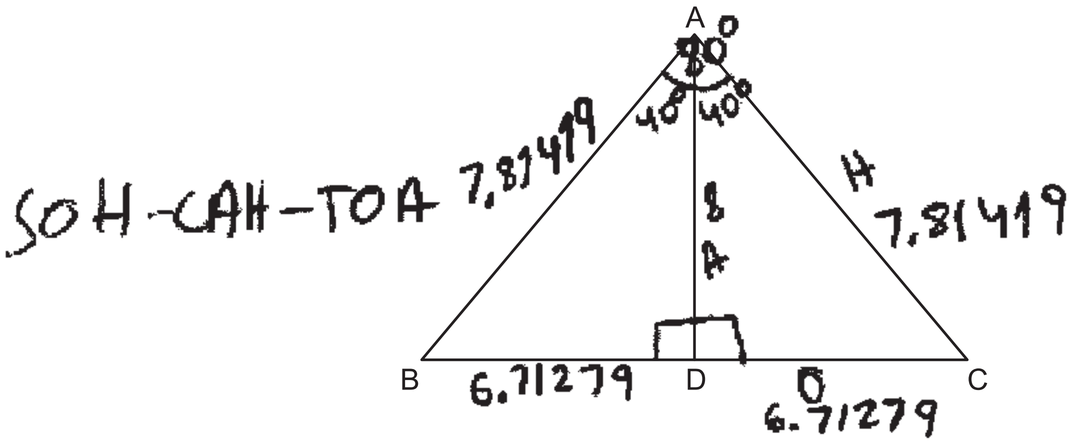
$\sin 50 = \frac{8}{x}$

$x = \frac{8}{\sin 50}$

$x = 10.44325831$

Score 3: The student correctly determined the length of all three sides of △*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*.

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

$x = 6.71279$

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

$16 + 45.061 = H^2$

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

$H = 7.8141$

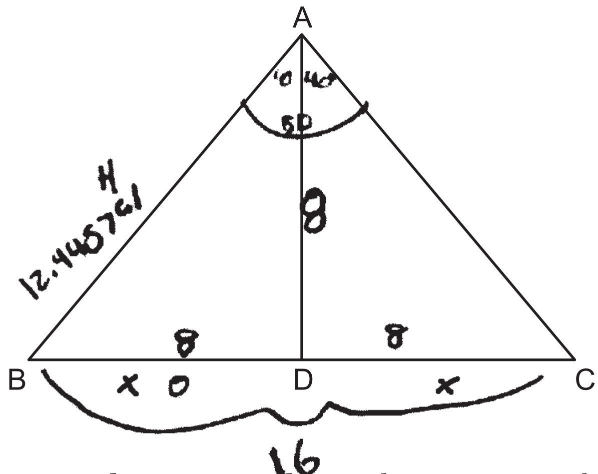
$P = 7.8141 + 7.8141 + 6.71279 + 6.71279$

$P = 29.1$

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*.

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

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

$x = 8$

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

$H = 12.4415791$

$P = 12.445791 + 12.445791 + 16$

$P = 40.9$

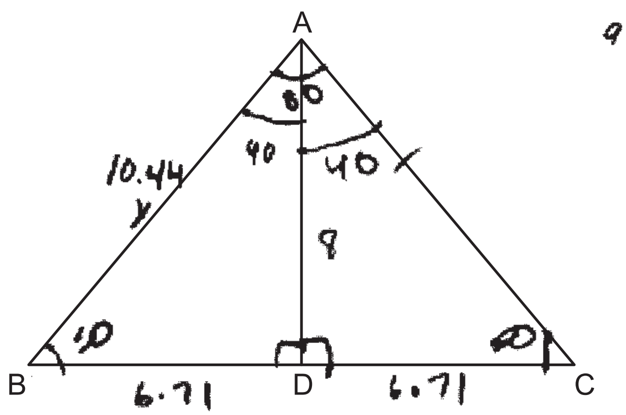
$\boxed{\triangle ABC \text{ Perimetere is } 40.9}$

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

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

SOH CAH TOA

$90+40=130$



If m∠BAC = 80° and AD = 8, determine and state the perimeter of △ABC, to the *nearest tenth*.

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

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

$y = 10.44$

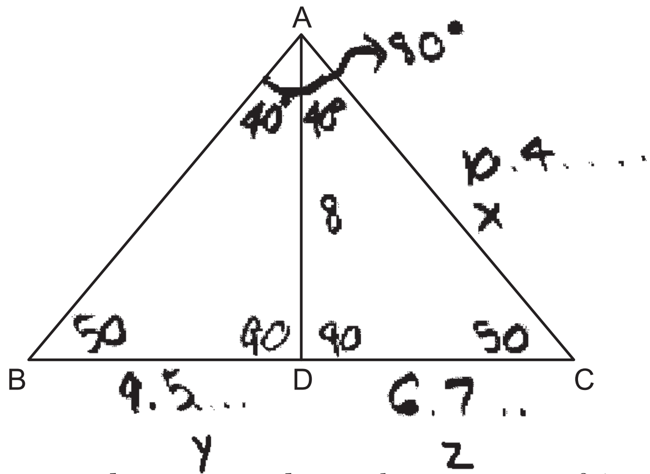
$\frac{BD \cdot \tan 50}{\tan 50} = \frac{8}{\tan 50}$

$BD = 6.71$

$P = 280.20$

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

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

$x\sin(50) = 8$

$x = 10.44325941$

$\frac{\text{Tan}(40)}{1} = \frac{8}{Y}$

$\frac{Y\,\text{Tan}(40) = 8}{\text{Tan}(40) \quad \text{Tan}(40)}$

$Y = 9.534028741$

$8^2 + Z^2 = 10.4^2$

$64 + Z^2 = 109.062$

$-64 \qquad -64$

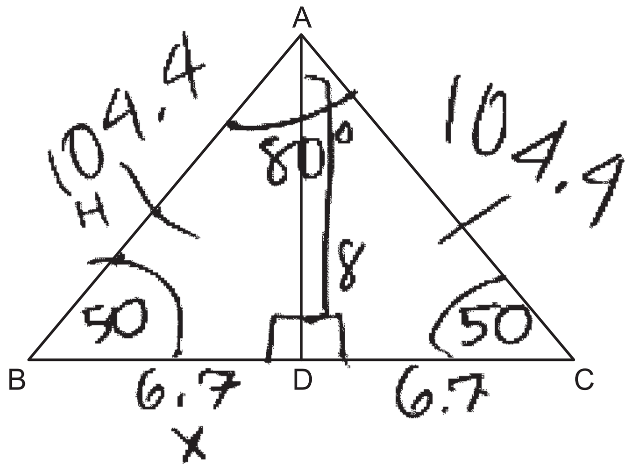
$\sqrt{Z^2} = 45.06$

$Z = 6.7128$

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

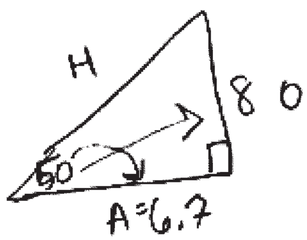
Question 32

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



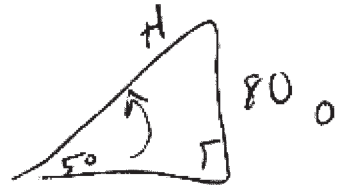
If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.

$\cancel{\frac{\tan 50°}{1} = \frac{8}{x}}$



$\frac{8}{\tan 50°} = x$

$x = 6.7$



$\frac{\sin 50°}{1} = \frac{80}{H}$

$\frac{80}{\sin 50°} = H$

$H = 104.4$

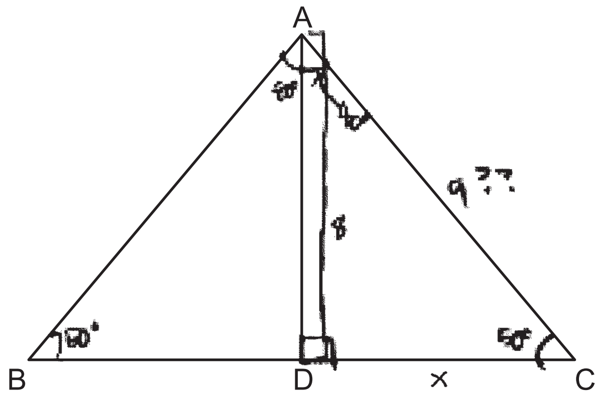
$(104.4 \times 2) + (6.7 \times 2)$

$\boxed{= 222.2}$

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

?

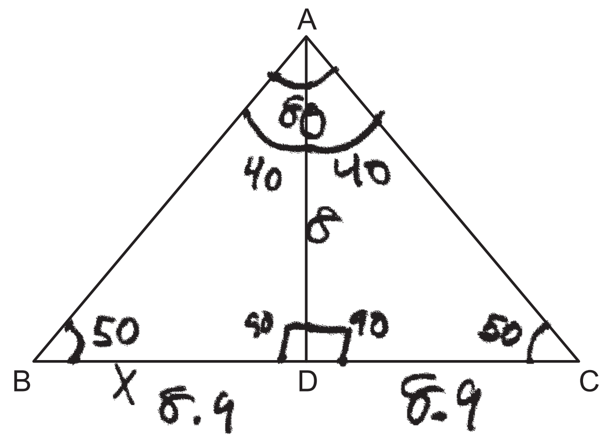
$\tan 50° = \frac{8}{x}$

$7 + 9 + 10 = \boxed{38}$

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*.

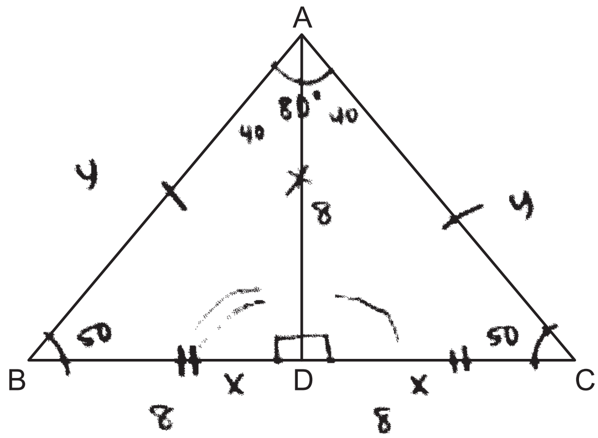
$$\frac{\tan(40)}{1} = \frac{x}{8}$$

$$x = 6.9$$

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*.

$40 + 90 = 130$

$180 - 130 = 5$

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

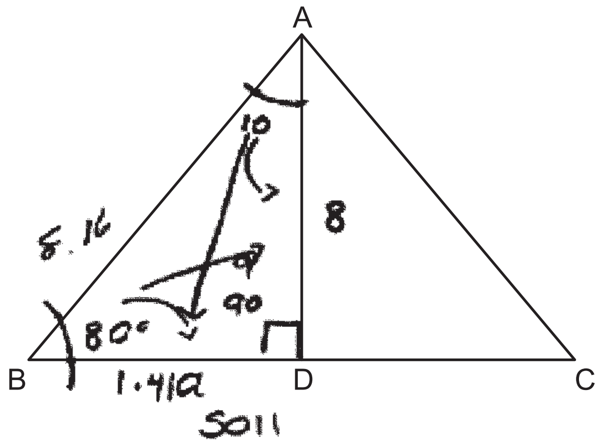
$$\sqrt{x^2} = \sqrt{64}$$

$$x = 8$$

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

$\frac{\text{Tan } 80°}{1} = 8/x$

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

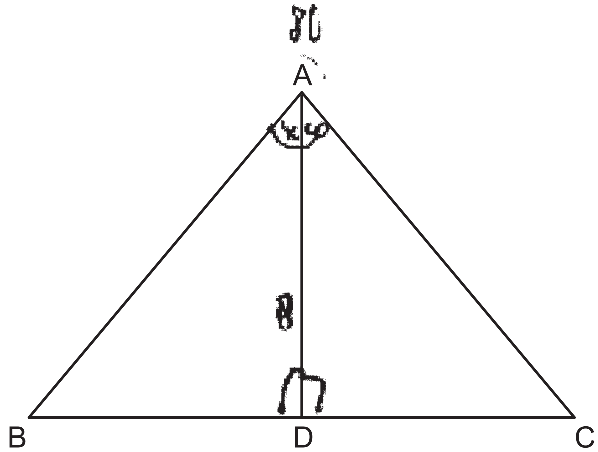
8.16 ..... + 1.4.19 (2) ......

+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*.

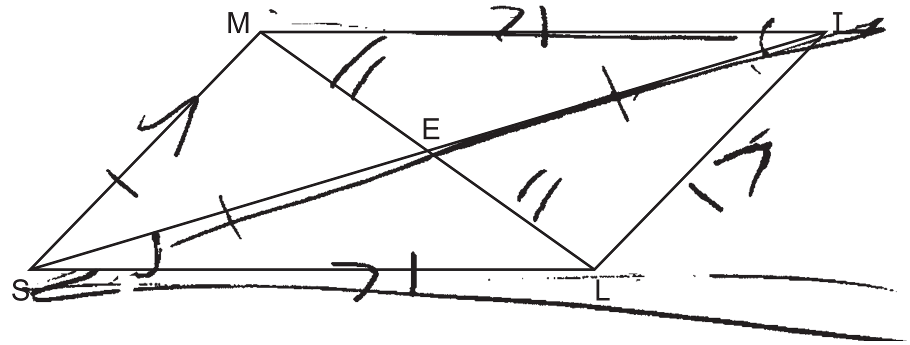
tan $\qquad \frac{x}{8}$

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 $\overline{MS} \cong \overline{IL}$.



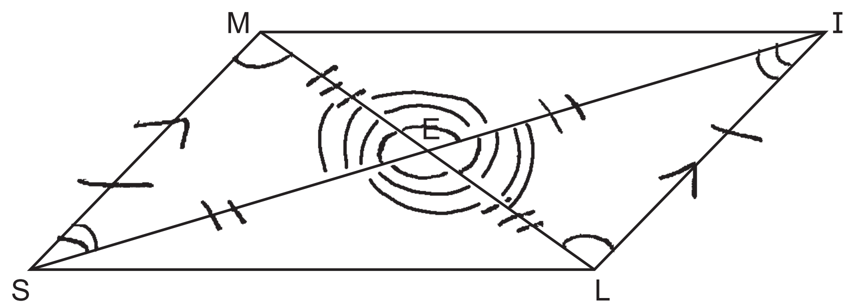
Prove: $\triangle MIE \cong \triangle LSE$

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 $\overline{MS} \cong \overline{IL}$.



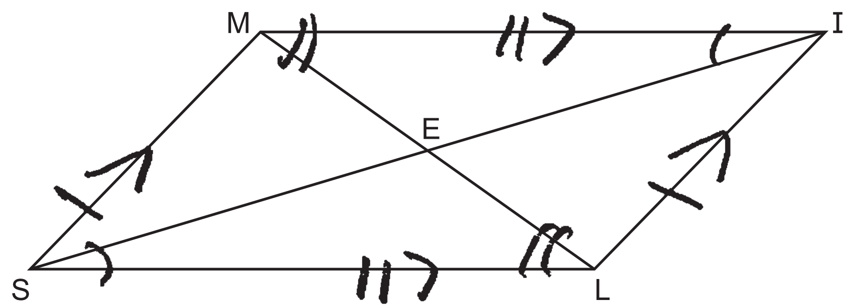
Prove: $\triangle MIE \cong \triangle LSE$

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 $\overline{MS} \cong \overline{IL}$.



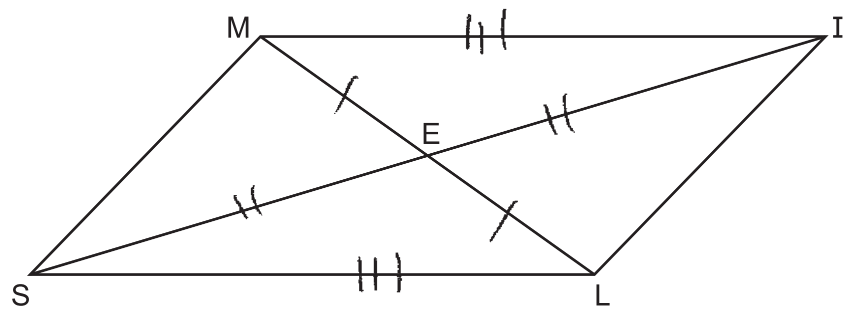
Prove: $\triangle MIE \cong \triangle LSE$

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 a transversal create $\cong$ $\angle$s (alt. interior)
5. $\angle IME \cong \angle SLE$	5. parallels cut by a 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 $\cong$ + $\parallel$, then it is a ▱.

$\overline{MI} \cong \overline{SL}$

opp sides of a ▱ are $\cong$

$\overline{ME} \cong \overline{EL}$
$\overline{SE} \cong \overline{IE}$

the diagonals of a ▱ bisect each other

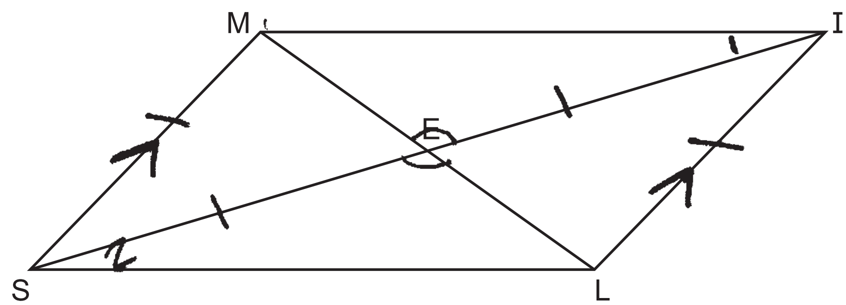
$\triangle MIE \cong \triangle LSE$

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 $\overline{MS} \cong \overline{IL}$.



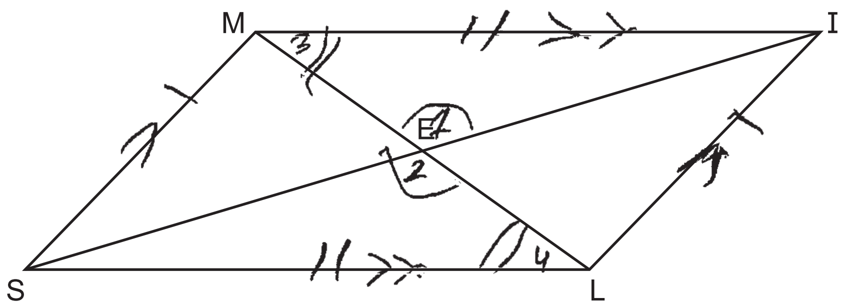
Prove: $\triangle MIE \cong \triangle LSE$

Statements	Reasons
1. Quadrilateral SMIL, 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. ∡MEI 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 $\overline{MS} \cong \overline{IL}$.



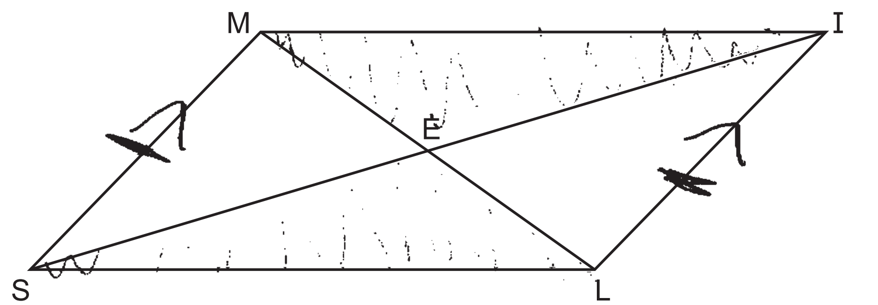
Prove: $\triangle MIE \cong \triangle LSE$

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 $\overline{MS} \cong \overline{IL}$.



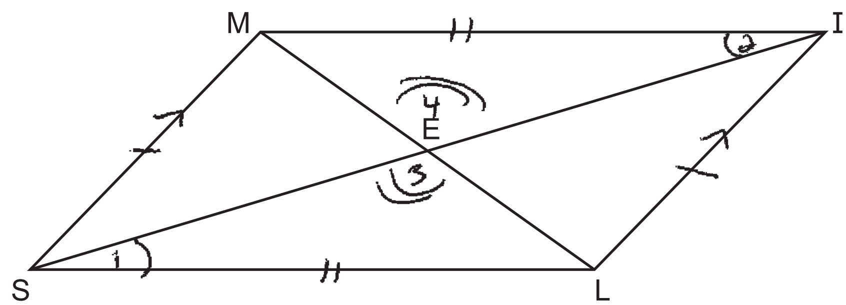
Prove: $\triangle MIE \cong \triangle LSE$

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 $\angle$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 $\cong$
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 $\cong$ $\triangle$s are $\cong$
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 $\overline{MS} \cong \overline{IL}$.



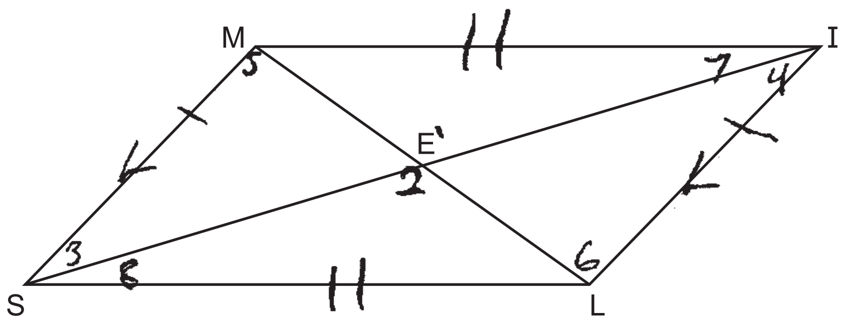
Prove: $\triangle MIE \cong \triangle LSE$

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 ≅ and ∥, then ▱
③ ∠1 ≅ ∠2	③ If 2 lines ∥, then Alt. Int. ∠'s ≅
④ ∠3 ≅ ∠4	④ Vertical ∠'s ≅
⑤ $\overline{MI} \cong \overline{SL}$	⑤ Opp Sides ▱ ≅
⑥ △MIE ≅ △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: $\triangle MIE \cong \triangle LSE$

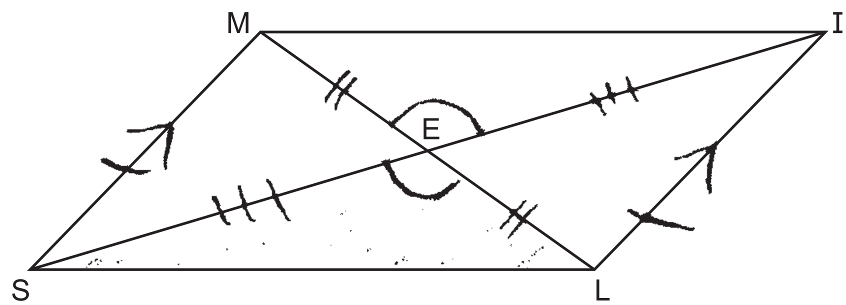
statements	reasons
① Quad SMIL Diagnols $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$	① Given
② $\angle 1$ & 2 are vertical $\angle$s	② intersecting lines form vertical $\angle$s
③ $\angle 3 \cong \angle 4$ &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



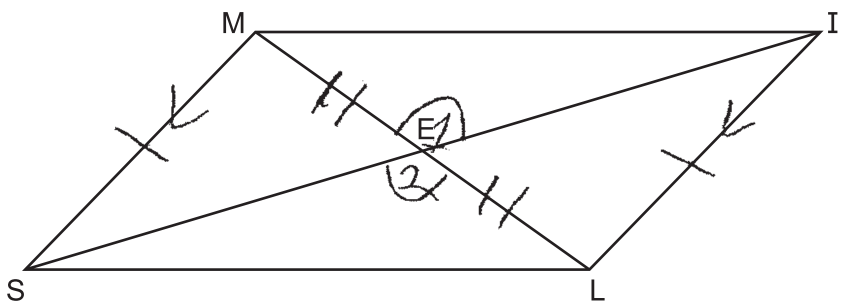
Prove: $\triangle MIE \cong \triangle LSE$

Statements:	Reasoning:
Quad SMIL	1) Given
1) $\overline{MS} \parallel \overline{IL}$	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 $\triangle MIE \cong \triangle LSE$.

Question 33

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



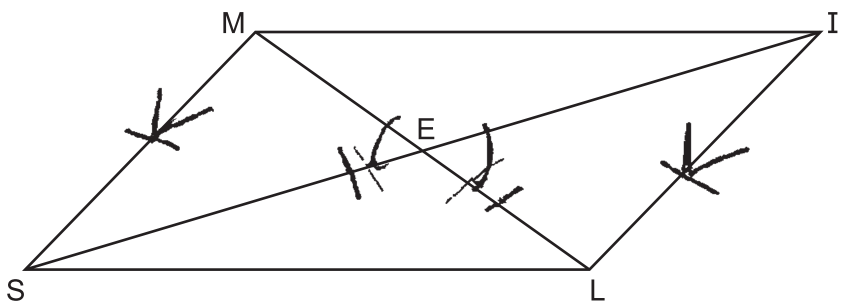
Prove: $\triangle MIE \cong \triangle LSE$

Statement	Reason
S (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
S (2) $ME \cong LE$	(2) A midpoint divides a segment into 2 $\cong$ segments
A (3) $\angle 1 \cong \angle 2$	(3) intersecting lines form $\cong$ vertical angles
(4) $\triangle MIE \cong \triangle LSE$	(4) SAS $\cong$ 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 $\overline{MS} \cong \overline{IL}$.



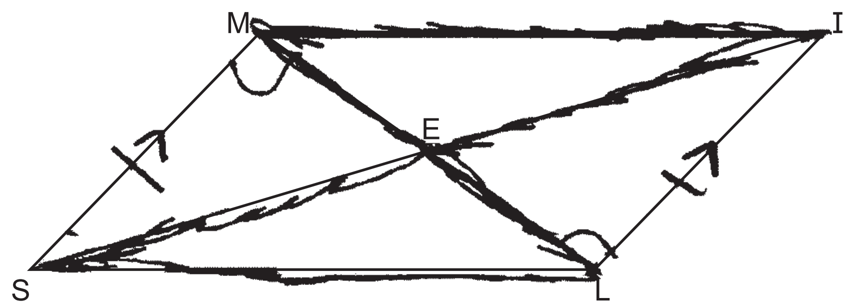
Prove: $\triangle MIE \cong \triangle LSE$

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



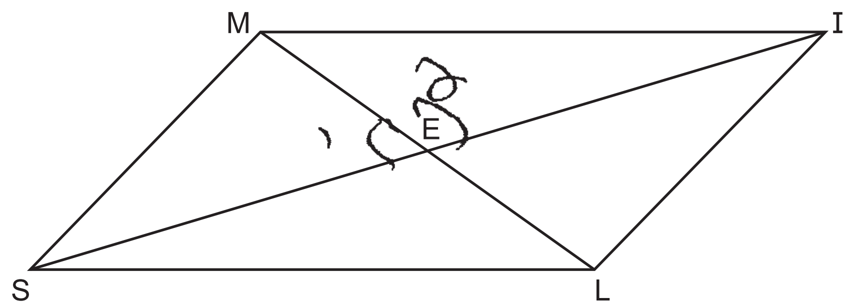
Prove: $\triangle MIE \cong \triangle LSE$

statement	Reason
① Quad SMIL, diagonals IS & ML intersect at point E, MS ∥ IL and MS ≅ 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 ∠SME ≅ ∠ILE, ∠	③

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 $\overline{MS} \cong \overline{IL}$.

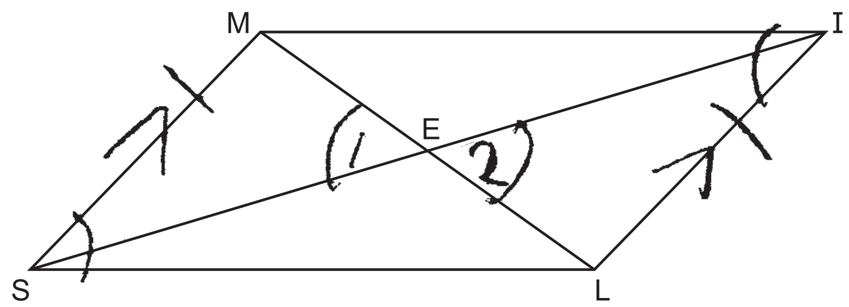


Prove: $\triangle MIE \cong \triangle LSE$

Statements	Reasons
① $\overline{MS} \parallel \overline{IL}$, $\overline{MS} \cong \overline{IL}$, intersect at E	① Given
② E=E	② reflexive
③ $\angle 1 + \angle 2 = 180$	③ compbementary angl
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: $\triangle MIE \cong \triangle LSE$

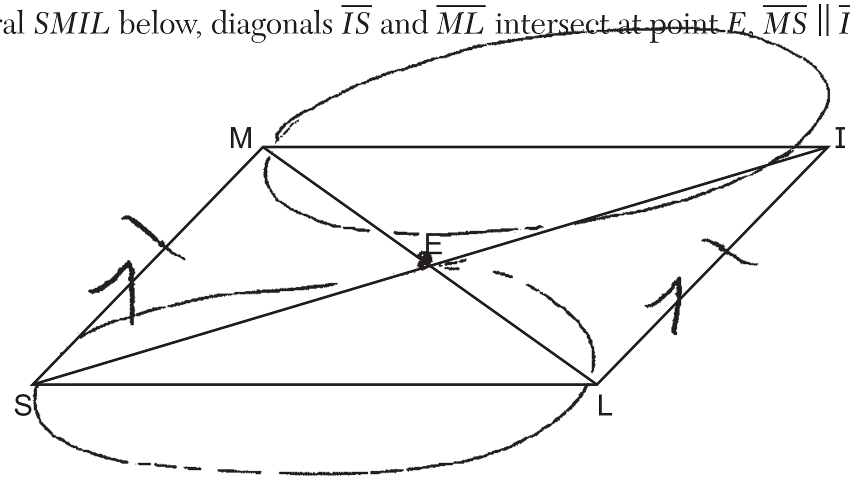
statement	reasons
1. In quadrilateral SMIL below, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$	1. Given
2. $\angle 1 \cong \angle 2$	2. opposite angles are congruent
3. $\angle S \cong \angle I$	3. 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: $\triangle MIE \cong \triangle LSE$

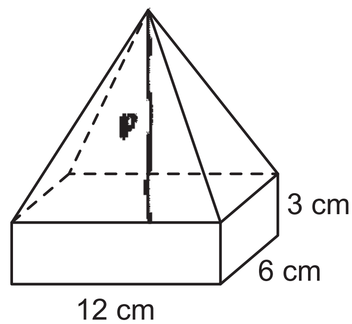
statement
6) $\Delta MIE \cong \Delta LSE$
Reasoning
6) ASA ≅ ASA

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~~ 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.

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

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

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

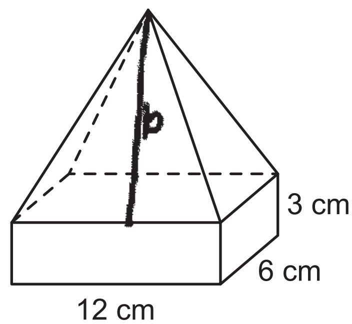
$456(2.5) = 1140$

1140 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.

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

$V = Bh$

$12 \cdot 6 \cdot 3 = 216$

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

$216 + 240 = 456$

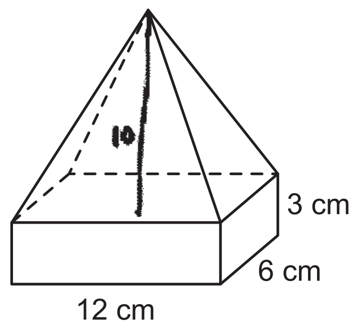
$456(2.5) =$

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

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

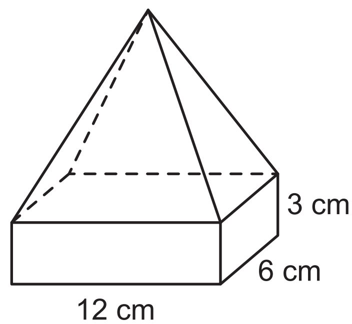
$\frac{2.5}{1} = \frac{x}{456}$

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

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.

$V = 12 \cdot 6 \cdot 3$

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

$\times 2.5$

$M = 540 \text{ g}$

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

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

$\times 2.5$

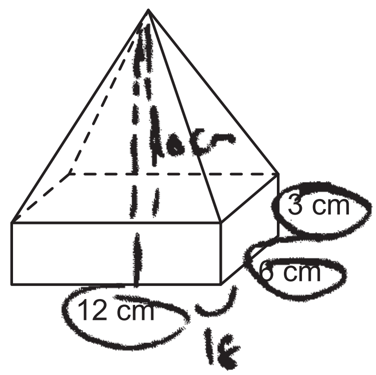
$M = 600 \text{ g}$

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

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.

$12 \times 6 \times 3 = 216$

$V = 10 \times 18 = 180$

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

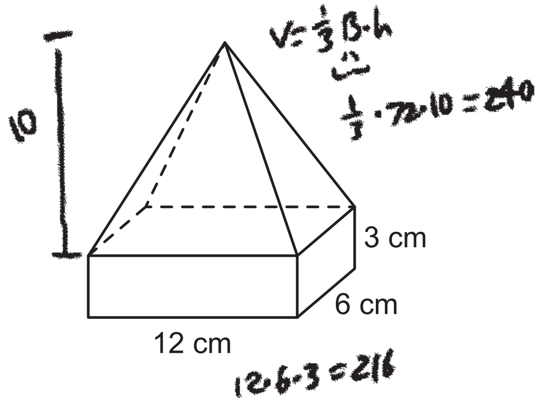
396 × 2.5 grams =

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.



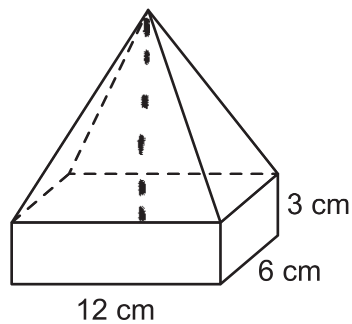
The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

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

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.

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

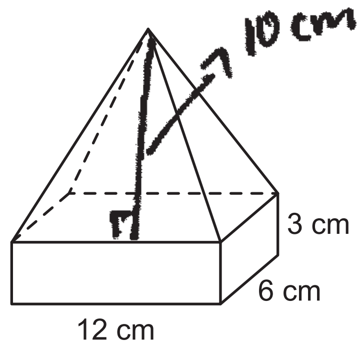
$V = \frac{1}{3}(12)(10)$
$V = 40$

$216 + 40 = 256$

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

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

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.

$V_{\square} = Bh$

$V = (12 \cdot 6)3$

$V = 216$

$V_{\Delta} = Bh$

$V = (12 \cdot 6)10$

$V = 720$

$\underline{216}$

936

936

$\underline{\times 2.5}$

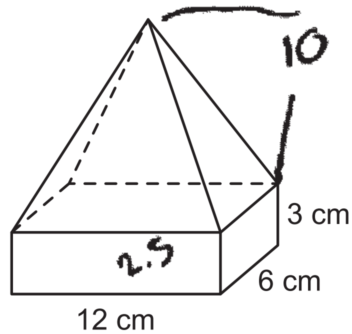
2340

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.

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

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

76

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

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

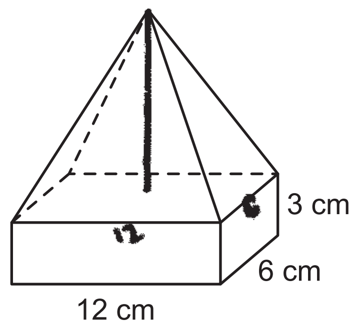
$x = 190$

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.

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

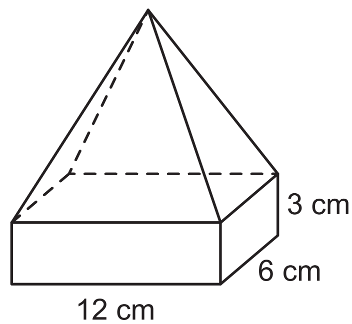
$2.5 \cdot 240 = 600\text{g}$

600grams 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

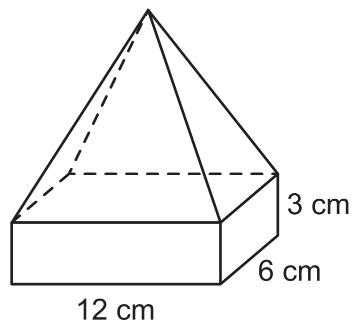
$V = (12)(6)(10)$

$V = 720$

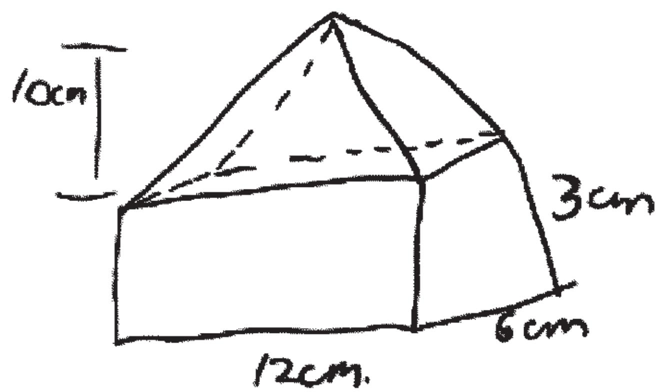
$936 \div 2.5 = 374.4$

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.

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.



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

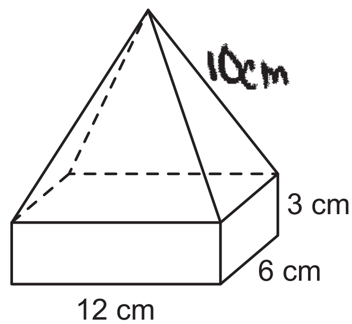
$V = \frac{1}{3}(216) \cdot 10$

$V = 72 \cdot 10$

$V = 720$

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

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.

$V = L \times W \times H$

$12 \times 6 \times 10$

$V = 720$

$M = V \cdot D$

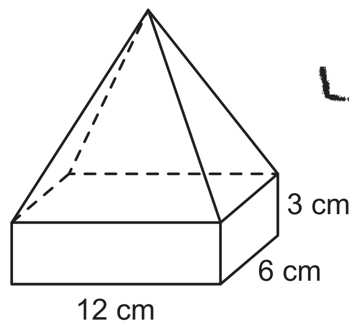
$720 \cdot 2.5 = 1800g$

Density

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

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.



$L=12$

$w=6$

$h=3$

$h=10$

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.

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

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

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

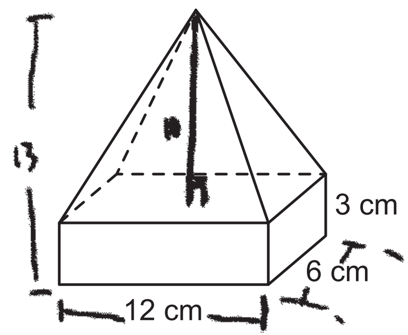
$V=l\cdot w\cdot h$

$V=12\cdot 6\cdot 3$

$V=216$

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

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.

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

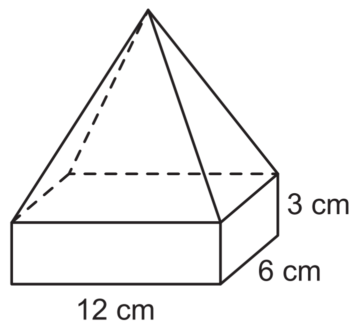
$\frac{m \cdot 2.5}{2.5} = \frac{10}{2.5}$

$m = 4$

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.

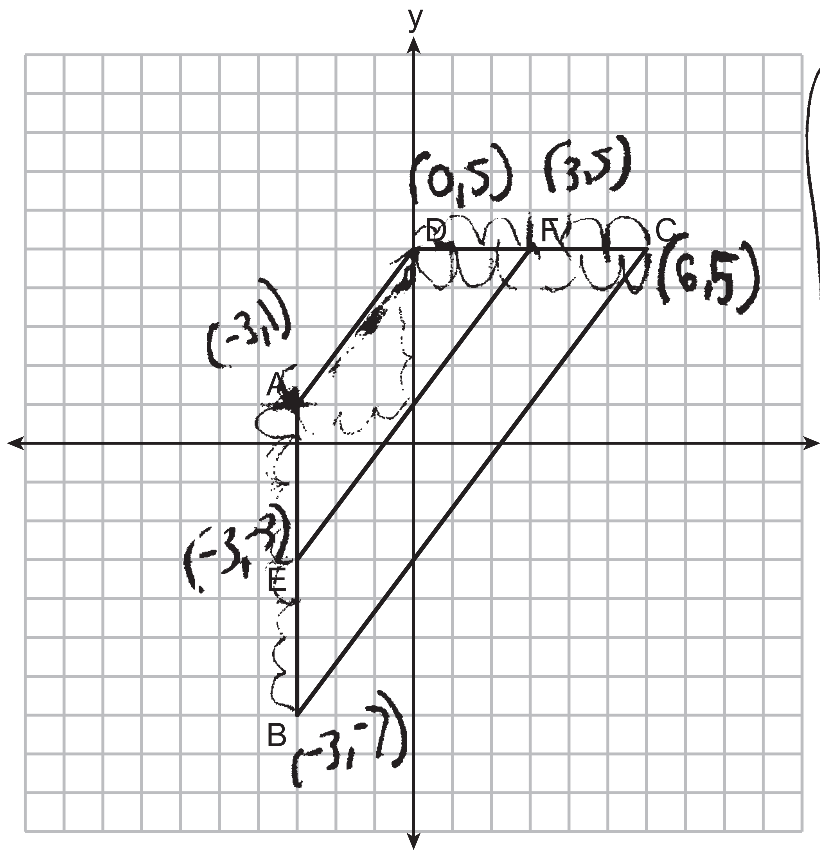
35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.

$\overline{AD}$

X	Y
-3	1
0	5

$\overline{BC}$ A D

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 $\overline{BC}$.

x	y
-3	-3
3	5

$\overline{EF}$

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

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

The slopes are the same for all 3 lines
∴ they are ∥ to one another.

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

$AD = \sqrt{(0-(-3))^2 + (5-1)^2}$
$\sqrt{9+16}$
$\sqrt{25}$
$\boxed{AD = 5}$

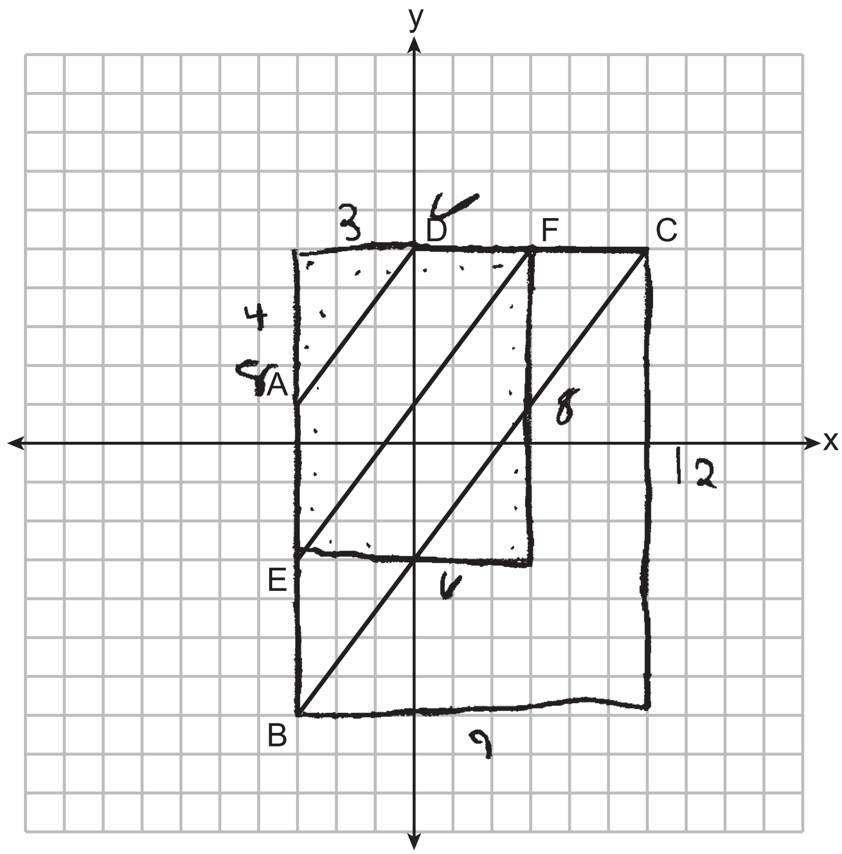
$EF = \sqrt{(3-(-3))^2 + (5-(-3))^2}$
$\sqrt{36+64}$
$\sqrt{100}$
$\boxed{EF = 10}$

$BC = \sqrt{(6-(-3))^2 + (5-(-7))^2}$
$BC = \sqrt{81 + 144}$
$\sqrt{225}$
$\boxed{BC = 15}$ $(AD+BC) = 20$

Yes EF is Half of (AD + BC)
EF = 10
AD + BC = 20
10 is half of 20
$EF = \frac{1}{2}(AD+BC)$ ✓

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

slope $\overline{AD} = \frac{4}{3}$ $\parallel$

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

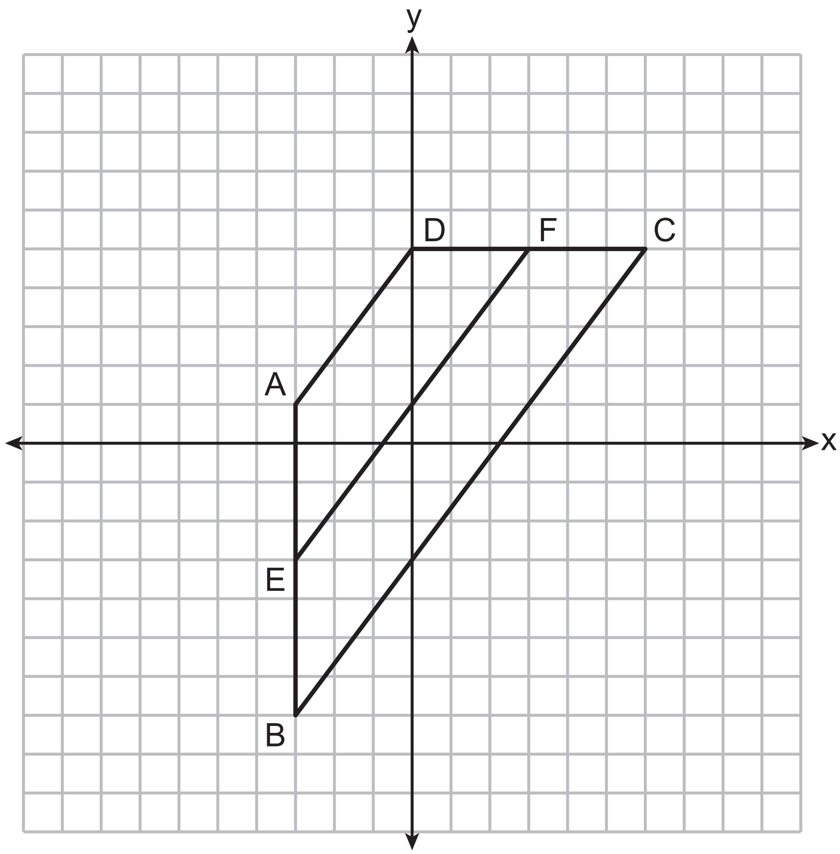
AD $4^2+3^2=c^2$
$16+9=c^2$
$\sqrt{25}=\sqrt{c^2}$
$\boxed{c=5}$

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

Yes

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

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

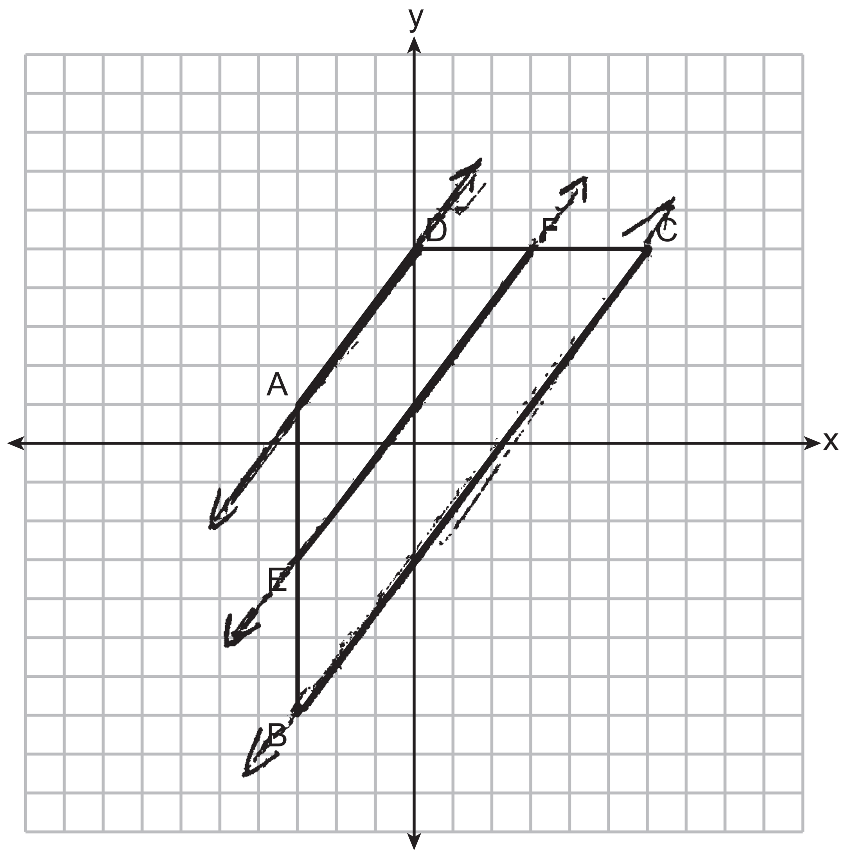
$10 = \frac{1}{2}(15 + 5)$

$10 = \frac{1}{2}(20)$ ✓

$10 = 10$

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.

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

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.

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

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

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

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

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

$D = \sqrt{100}$

$D = 10$

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

$\sqrt{9 + 16}$

$\sqrt{25}$

$D=5$

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

$\sqrt{81 + 144}$

$\sqrt{225}$

$D = 15$

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

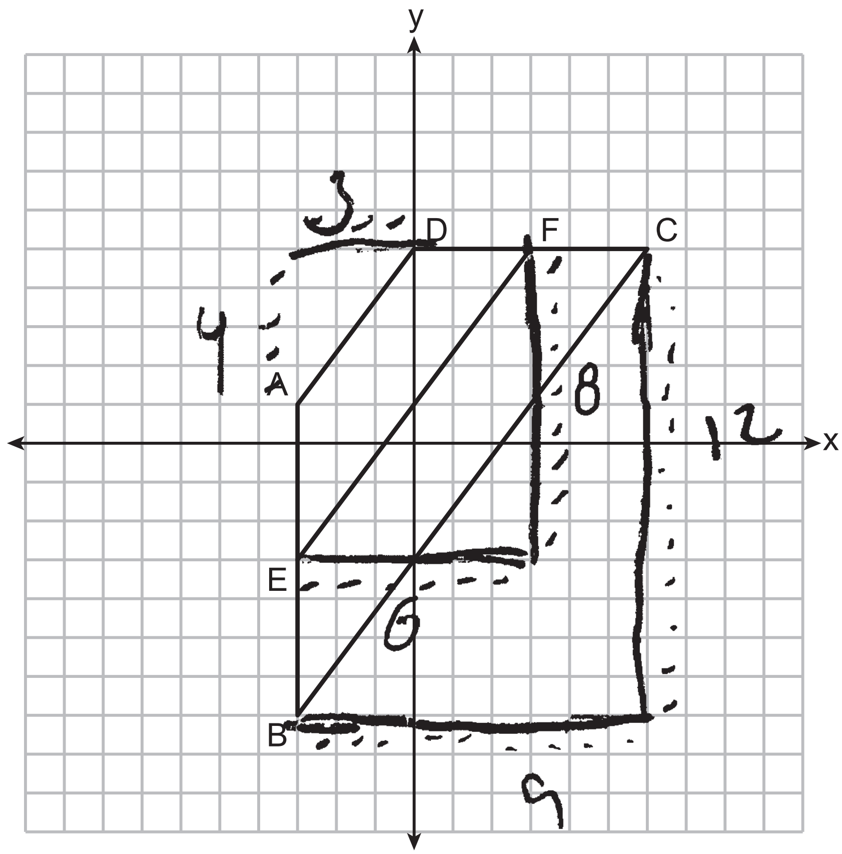
$10 = \frac{1}{2}(20)$

$10 = 10$ ✓

yes

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

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

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

$10 \neq 7.5$

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

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

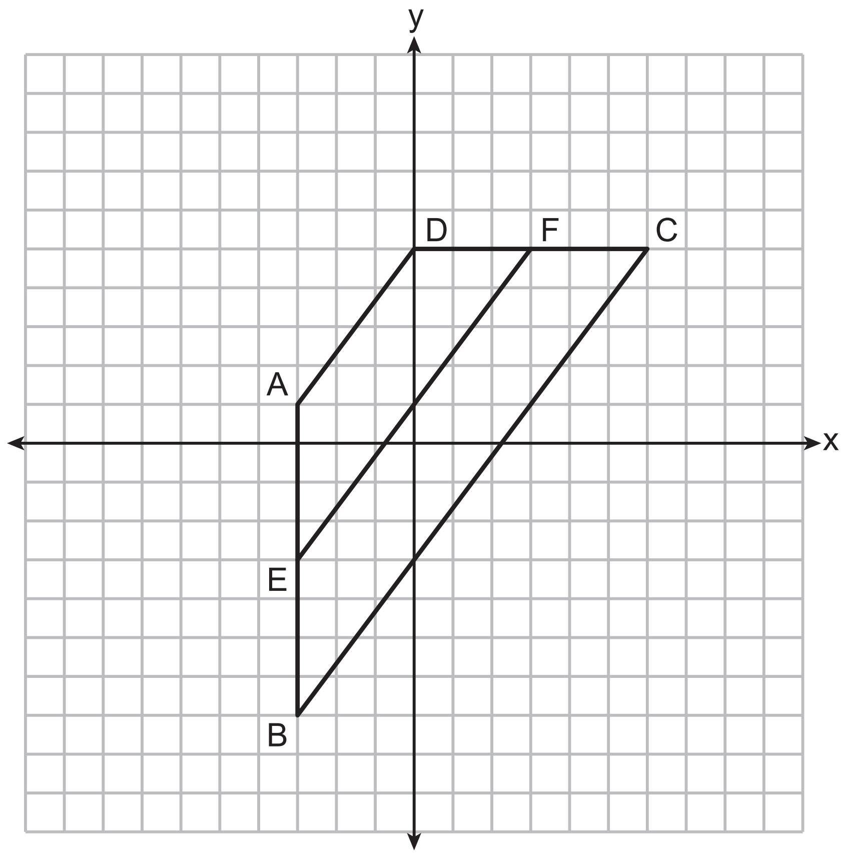
$16 + 9 = x^2$

$25 = x^2$

$5 = x$

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.

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

$\overline{BC}$ $\frac{6--3}{5--7}$ 3/4

∥

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

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

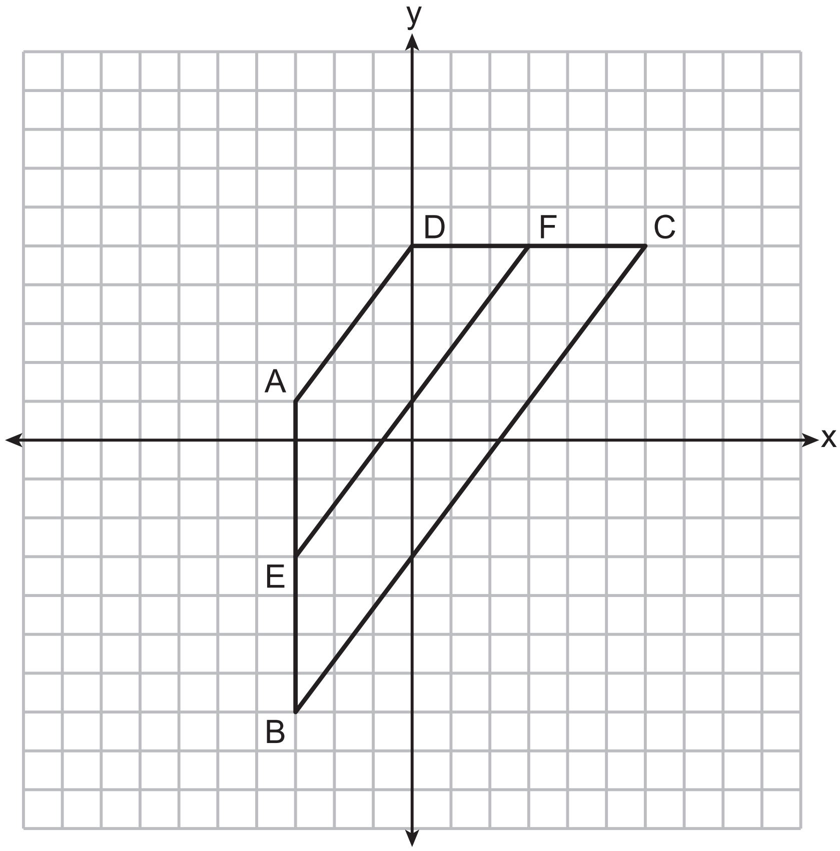
20/2 = 10

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

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

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.

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

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

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

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

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

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

$= \sqrt{36+36}$

$= \sqrt{72}$

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

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

$= \sqrt{9+4}$

$= \sqrt{13}$

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

$= \sqrt{36+100}$

$= \sqrt{136}$

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

$= \sqrt{9+36}$

$= \sqrt{45}$

$\therefore$ 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.

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

$= \sqrt{4+0}$

$= \sqrt{4}$

$= 2$

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

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

$2 \neq 5.16$

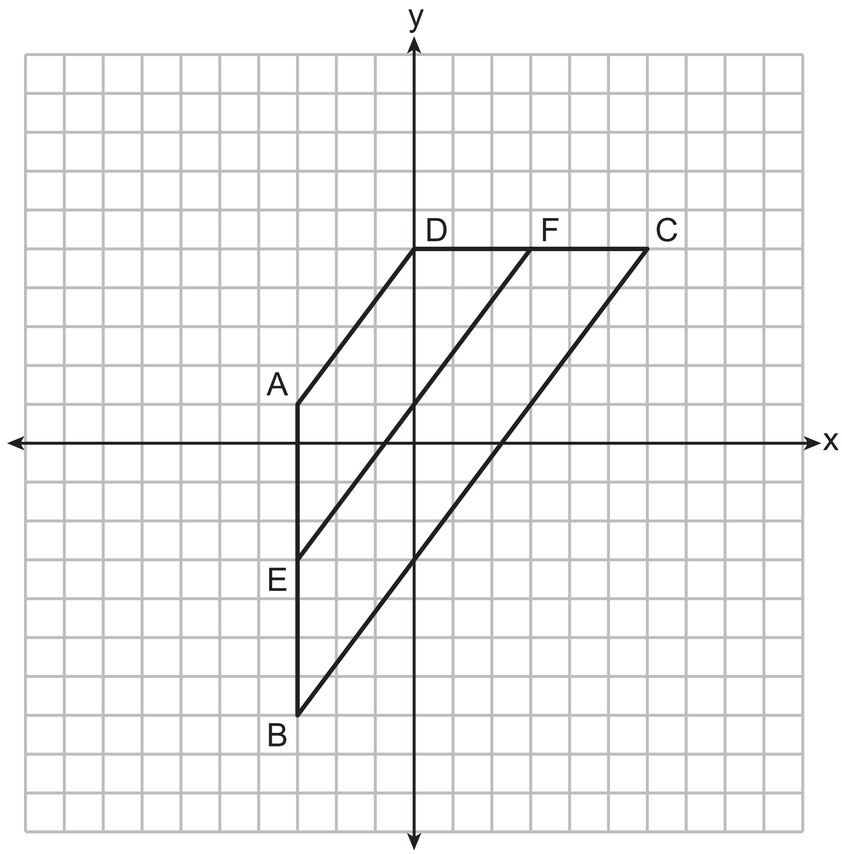
$d_{\overline{AD}} = 6.71$

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

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 ... 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

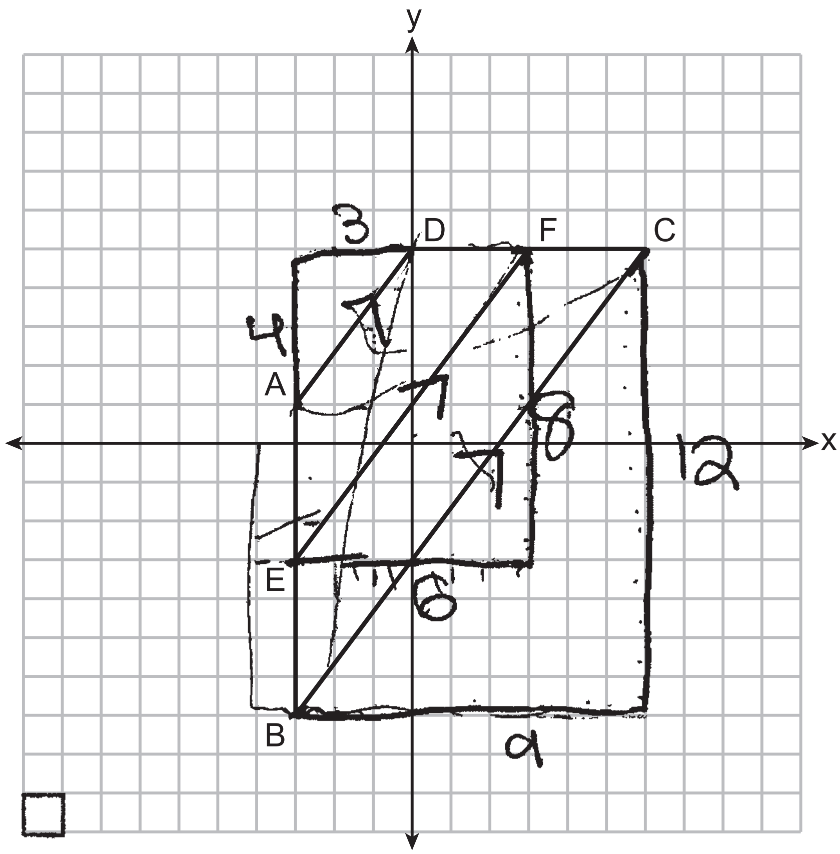
$8 = \frac{1}{2}(4 + 12)$

$8 = \frac{1}{2}(16)$

$8 = 8$

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 ∥ to $\overline{AD}$ and $\overline{BC}$ because they all have equal slopes and ∥ lines have = slopes.

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

$EF = \frac{1}{2}(AD + BC)$

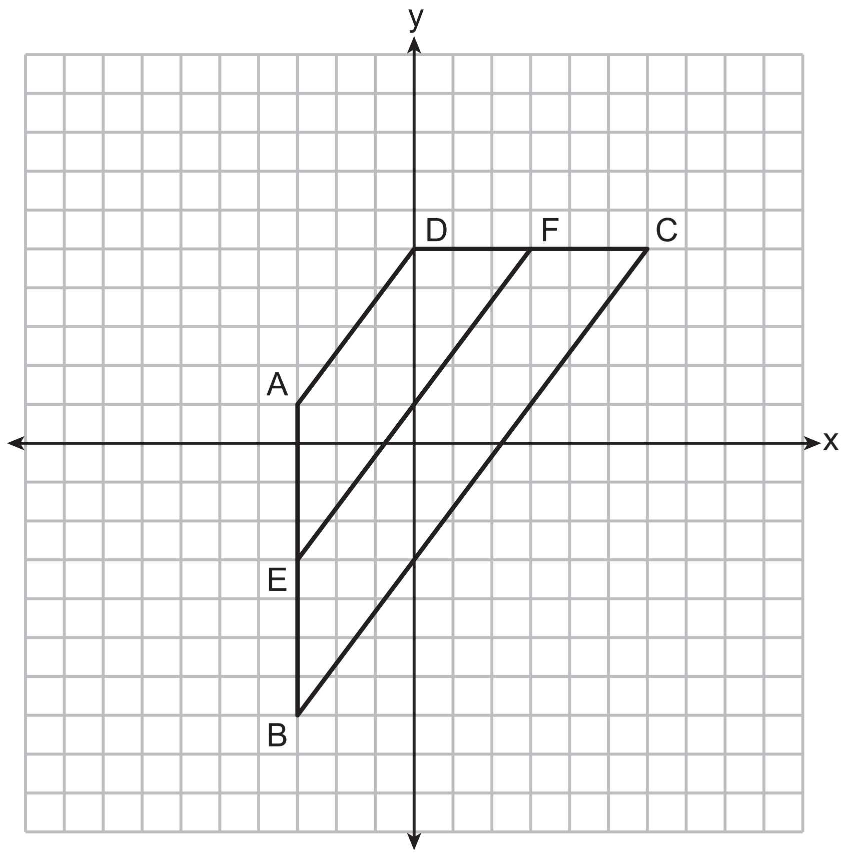
$\frac{4}{3} = \frac{1}{2}\left(\frac{4}{3} + \frac{4}{3}\right)$

$\frac{4}{3} = \frac{1}{2}\left(\frac{8}{3}\right)$

$\frac{4}{3} = \frac{4}{3}$ ✓

yes, $EF = \frac{1}{2}(AD + BC)$

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

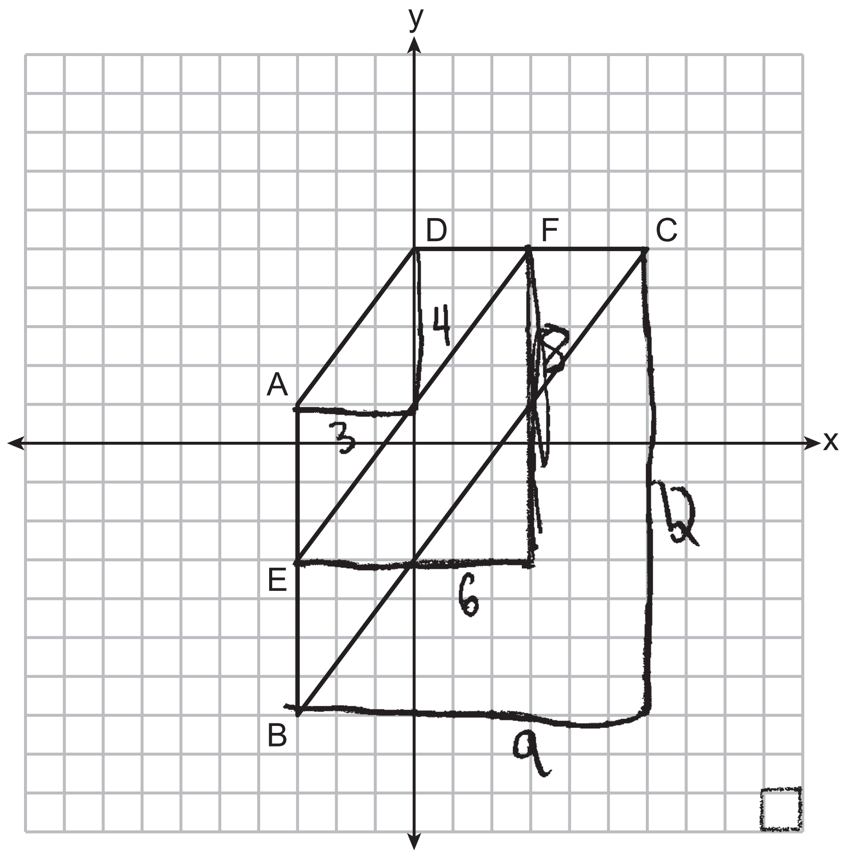
slope $\overline{BC} = \frac{4}{3}$

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.

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.

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 $\overline{EF}$.

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

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

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

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

$\parallel$ $\parallel$ $\overline{EF}$ is $\parallel$ to $\overline{AD}$ and $\overline{BC}$

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

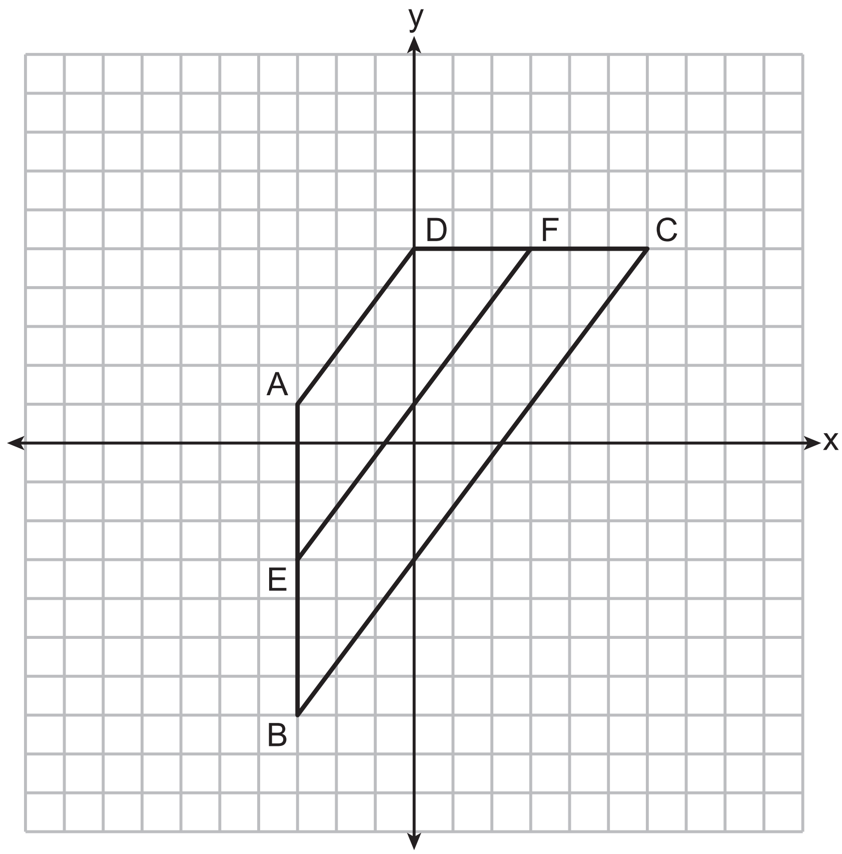
$10 = \frac{1}{2}(5+15)$
$10 = \frac{1}{2}(20)$
$10 = 10$ ✓
yes

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

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

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

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.

$D\sqrt{(-3-3)^2 + (-3-5)^2} = \sqrt{36+64} = 10$

$\overline{EF}$

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

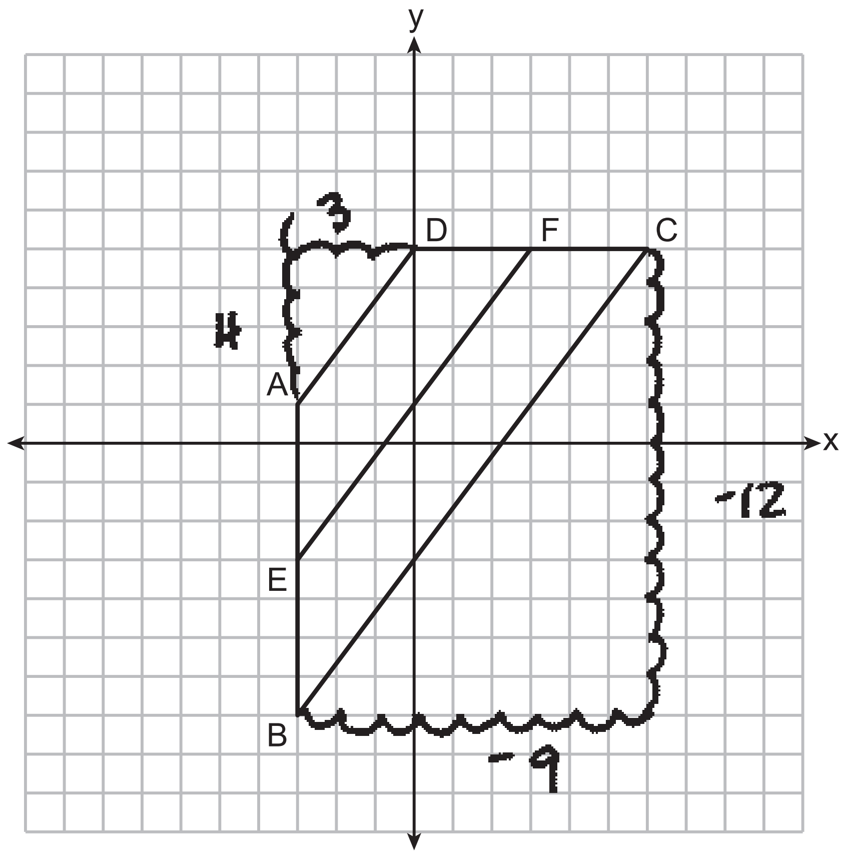
$10 = \frac{1}{2}(20)$

$10 = 10$

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 $\therefore \parallel$

ABCD is a trapezoid because

$\overline{AD} \parallel \overline{CB}$

Question 35 is continued on the next page.

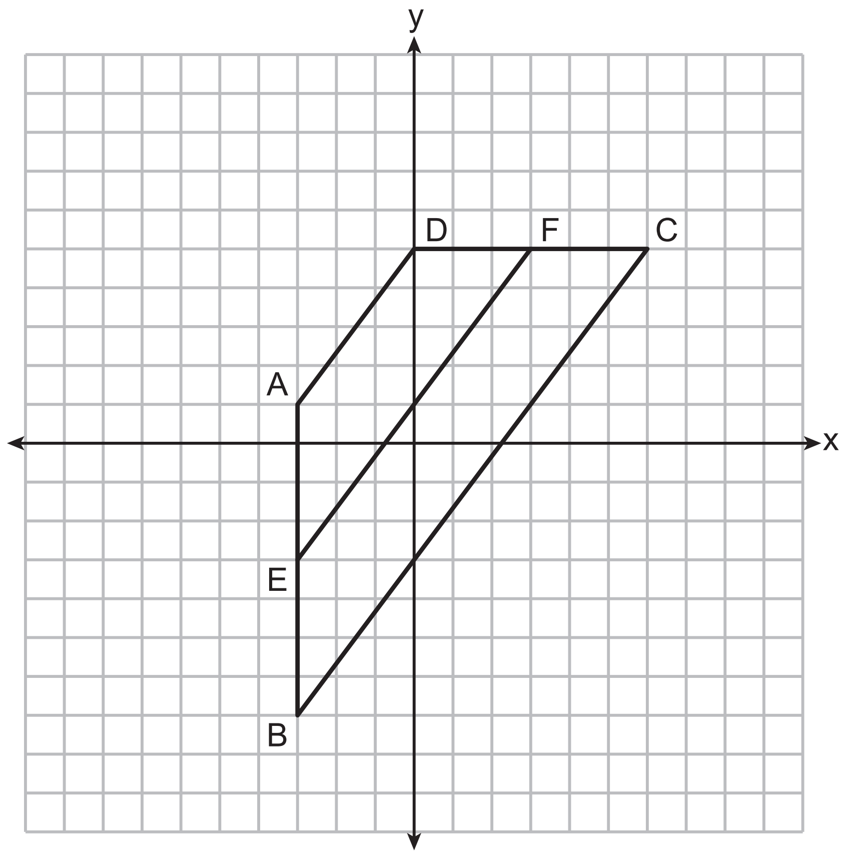
Score 2: The student proved *ABCD* is a trapezoid.

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.

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

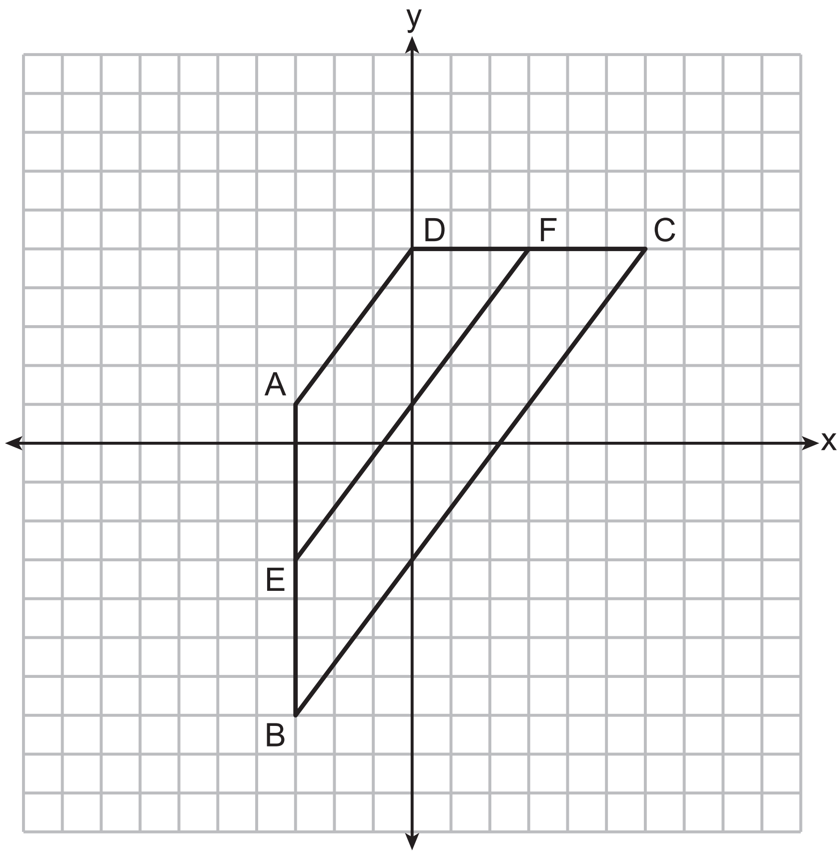
Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.

$7 = \frac{1}{2}(4 + 13)$

$7 = \frac{1}{2}(17)$

$7 = 8.5$

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.

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

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.

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

Question 35

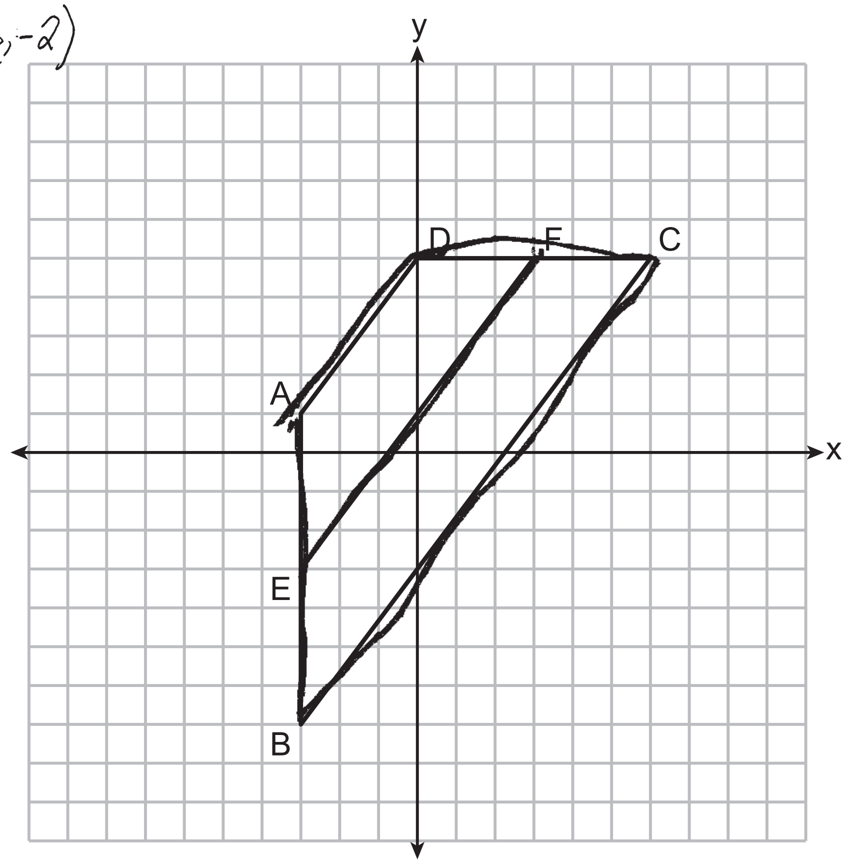
35 Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates $A(-3, 1)$, $B(-3, -7)$, $C(6, 5)$, and $D(0, 5)$. Segment *EF* is graphed with endpoints at coordinates $E(-3, -3)$ and $F(3, 5)$.

$\overline{EF}\ \frac{1}{2}(-3,6+3,-2)$

$\frac{0,4}{2}$

$(0,2)$

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 $\parallel$ lines and those lines are $\overline{AD}$ and $\overline{BC}$. $\overline{EF}$ is $\parallel$ 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.

$E(-3,-3)$
$F(3,5)$ $\rightarrow 0,2 = EF$

Yes it's equal

$A(-3,1)$
$D(0,5)$ $(-3,6) = AD \rightarrow (-3,6)$

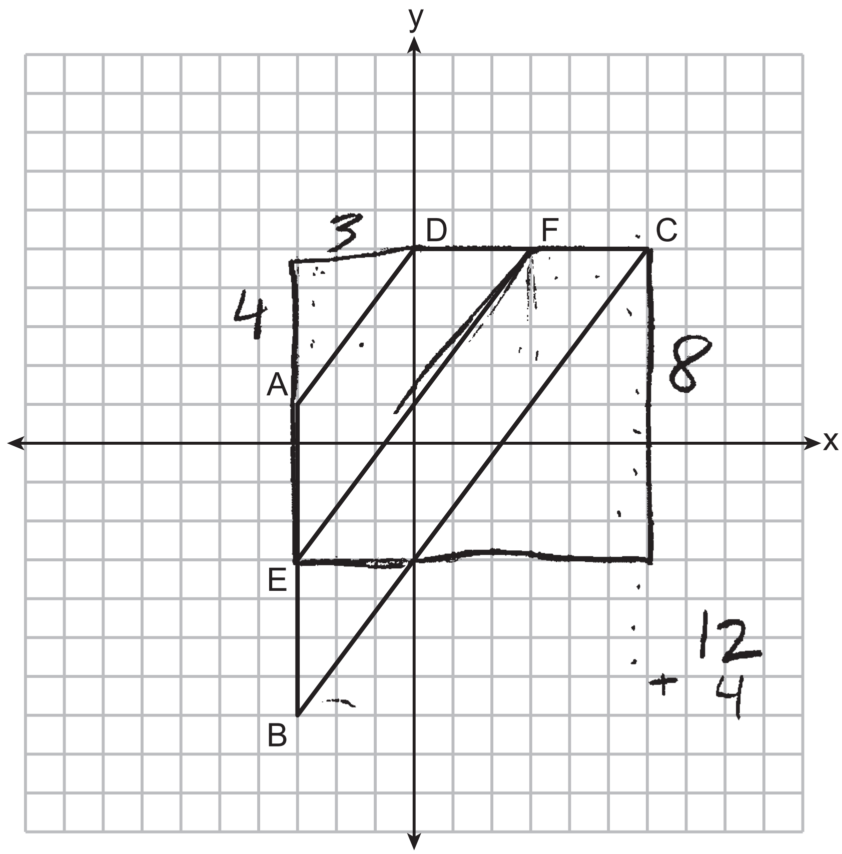
$+ \quad +$

$B(-3,-7)$
$C(6,5)$ $(3,-2)$ $BC \rightarrow (3,-2)$

$EF = \frac{1}{2}(0,4)$

$(0,2)$

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 $\overline{BC}$.

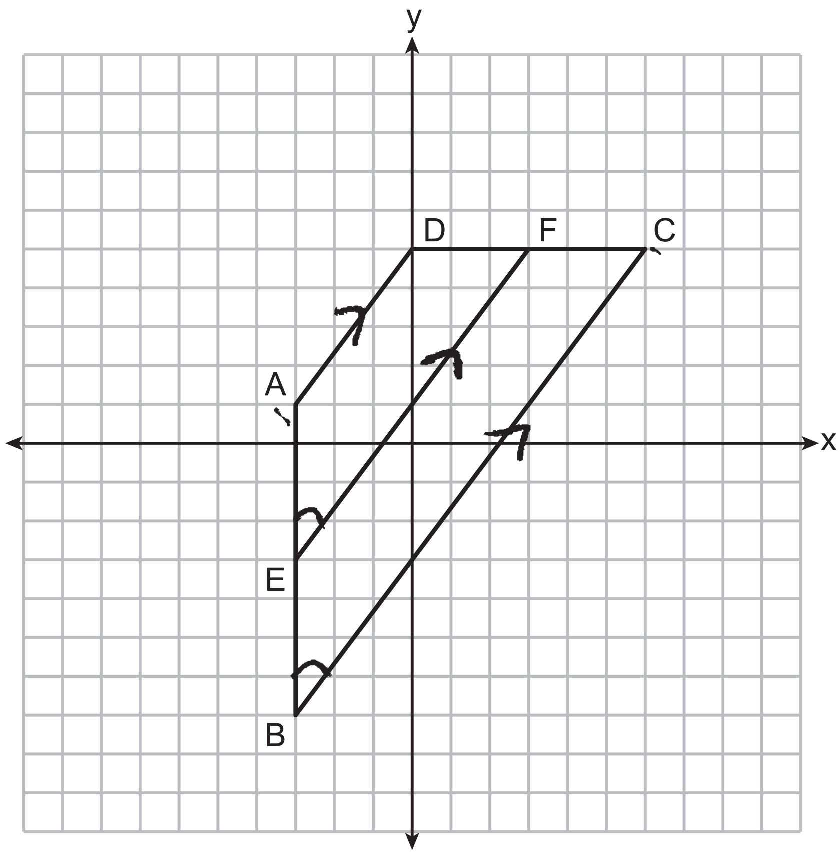
each side has 3 cubic units
between them and don't cross over
making them parrellel

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 $\therefore$ $\overline{EF}$ is half of $\overline{AD} + \overline{BC}$

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.

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.

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.