The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Wednesday, August 14, 2019 — 12:30 to 3:30 p.m.

MODEL RESPONSE SET

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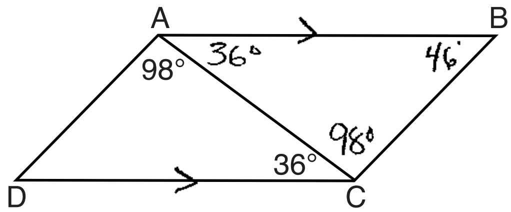
Question 25

25 In parallelogram *ABCD* shown below, m∠*DAC* = 98° and m∠*ACD* = 36°.



What is the measure of angle *B*? Explain why.

ABCD is a //-gram, so $\overline{AB} \parallel \overline{CD}$

By alt. int. ∠ theorem, ∠BCA = 98°,

∠BAC = 36°. ∠'s in △BAC must

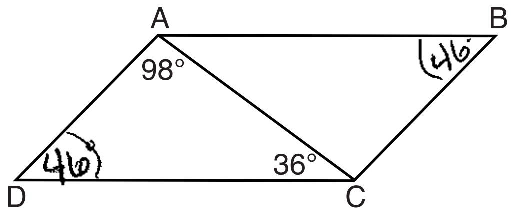
add up to 180°, so ∠B = 46°

Since 36 + 98 = 134, and 180 − 134 = 46.

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

Question 25

25 In parallelogram *ABCD* shown below, m$\angle DAC$ = 98° and m$\angle ACD$ = 36°.



180
−98
−36
46°

What is the measure of angle *B*? Explain why.

$\measuredangle D = 46°$ because $\measuredangle$ sum of a $\triangle$ in $\triangle ACD$.

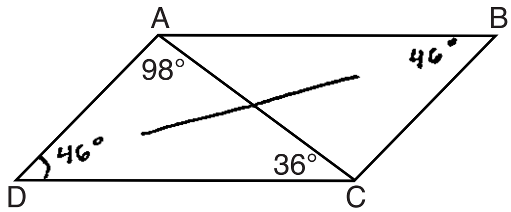
$\measuredangle D \cong \measuredangle B$ because in a parallelogram, opposite $\measuredangle$'s are $\cong$.

So $\boxed{\measuredangle B = 46°.}$

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

Question 25

25 In parallelogram *ABCD* shown below, m∠*DAC* = 98° and m∠*ACD* = 36°.



What is the measure of angle *B*? Explain why.

98 + 36 = 134

180 − 134 = 46

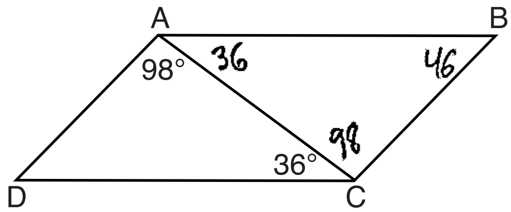
$\boxed{m\angle B = 46°}$

First, I found m∠D. A triangle has 180°, so I added m∠A & m∠C from △DAC and got 134°. Then, I subtracted that from 180 in order to get m∠D. m∠D = 46°. Finally, I know opp. angles in a parallelogram are congruent, so ~~the assorted~~ m∠D = m∠B. By chain rule, m∠B would be 46°.

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

Question 25

25 In parallelogram *ABCD* shown below, m∠*DAC* = 98° and m∠*ACD* = 36°.



What is the measure of angle *B*? Explain why.

98+36= 134

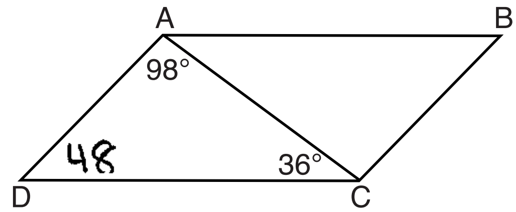
180 - 134= 46

m∡B is 46° because of ≅ alternate interior angles at ∡A + ∡C and $\overline{AB} \parallel \overline{CD}$

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

Question 25

25 In parallelogram *ABCD* shown below, m∠*DAC* = 98° and m∠*ACD* = 36°.



What is the measure of angle *B*? Explain why.

98+34=132

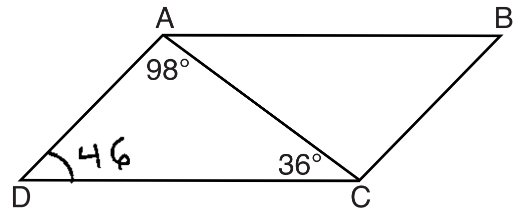
48

Angle B is 48 because in a parallelogram opposite angles are ≅. If ∡D is 48, then ∡B is 48.

Score 1: The student made a transcription error. The student wrote an appropriate explanation.

Question 25

25 In parallelogram *ABCD* shown below, m∠*DAC* = 98° and m∠*ACD* = 36°.



What is the measure of angle *B*? Explain why.

$98+36=134$

$\angle D \stackrel{?}{=} \angle B$

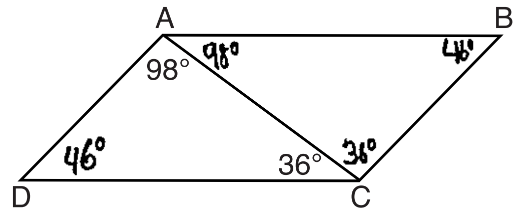
$$\begin{array}{r} 180 \\ -134 \\ \hline 46 \end{array}$$

$\angle D=46$

Score 1: The student found m∠*B* = 46°, but did not write an explanation.

Question 25

25 In parallelogram *ABCD* shown below, m∠*DAC* = 98° and m∠*ACD* = 36°.



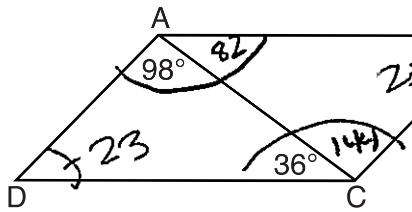
What is the measure of angle *B*? Explain why.

Angle B is 46° because the two triangles are the same So they have the same angles

Score 1: The student found m∠*B* = 46°, but the explanation is incomplete.

Question 25

25 In parallelogram *ABCD* shown below, m∠*DAC* = 98° and m∠*ACD* = 36°.



180
−36
144

a = bh

What is the measure of angle *B*? Explain why.

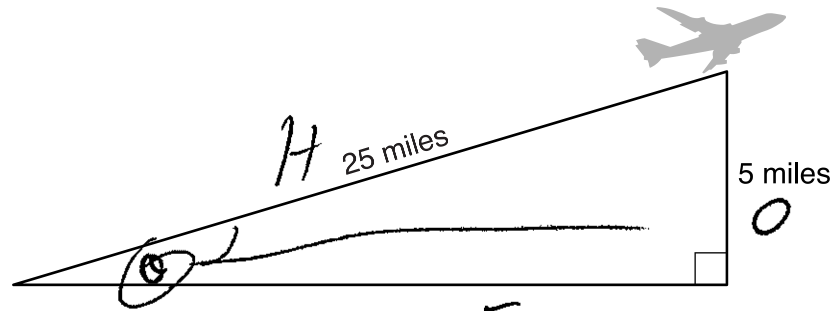
The measure of angle B is 23° because in a parallelogram, opposite sides are congruent and a triangle equals to 180° If you add the two measures and subtract 180 you get 46, and divided by 2 the measure is 23°.

180
−98
82

Score 0: The student gave a completely incorrect response.

Question 26

26 An airplane took off at a constant angle of elevation. After the plane traveled for 25 miles, it reached an altitude of 5 miles, as modeled below.



$\text{Sin}^{-1} = \frac{5}{25}$

To the *nearest tenth of a degree*, what was the angle of elevation?

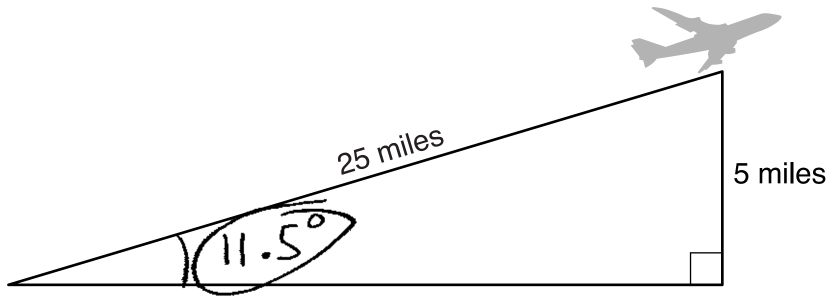
$\text{Sin}^{-1}\left(\frac{5}{25}\right) = 11.53695903$

$\boxed{11.5}$

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

Question 26

26 An airplane took off at a constant angle of elevation. After the plane traveled for 25 miles, it reached an altitude of 5 miles, as modeled below.



To the *nearest tenth of a degree*, what was the angle of elevation?

$\sin x = \frac{5}{25}$

$\sin^{-1}\left(\frac{5}{25}\right)$

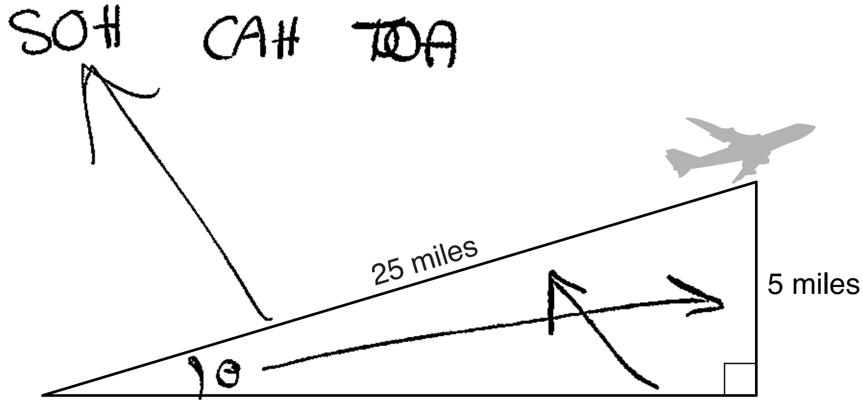
11.537

11.5°

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

Question 26

26 An airplane took off at a constant angle of elevation. After the plane traveled for 25 miles, it reached an altitude of 5 miles, as modeled below.



To the *nearest tenth of a degree*, what was the angle of elevation?

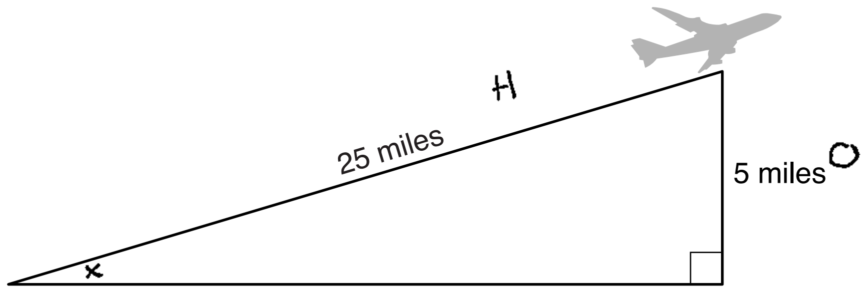
$$\sin\theta = \frac{5}{25}$$

Score 1: The student wrote a correct trigonometric equation, but no further correct work was shown.

Question 26

26 An airplane took off at a constant angle of elevation. After the plane traveled for 25 miles, it reached an altitude of 5 miles, as modeled below.

SOHCAHTOA



To the *nearest tenth of a degree*, what was the angle of elevation?

$\sin x = \frac{5}{25}$

$x = \sin^{-1}\left(\frac{5}{25}\right)$

$x = 11.53695903$

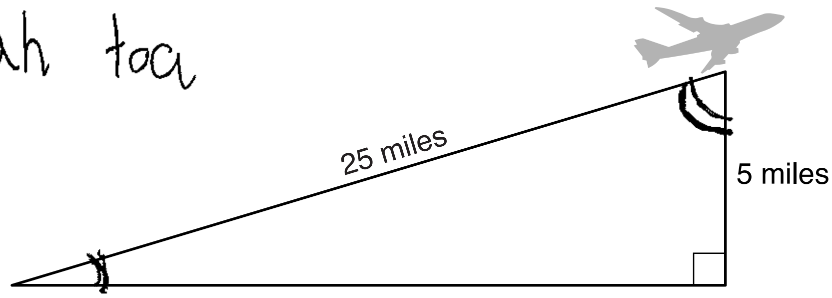
$x = 12°$

The ∡ of elivation is 12°

Score 1: The student did not round the answer to the nearest tenth of a degree.

26 An airplane took off at a constant angle of elevation. After the plane traveled for 25 miles, it reached an altitude of 5 miles, as modeled below.

Soh cah toa



To the *nearest tenth of a degree*, what was the angle of elevation?

$$\frac{\tan x}{1} = \frac{5}{25}$$

$$25x = 5$$

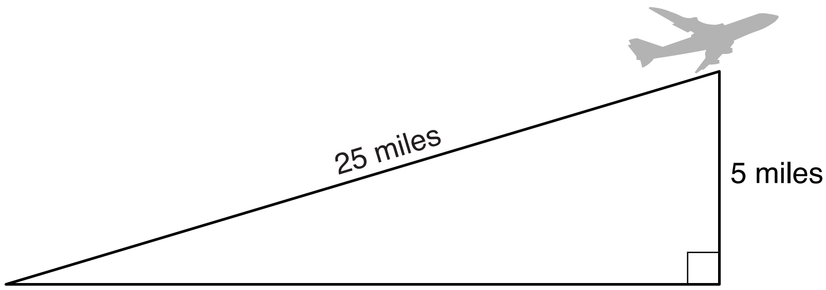
$$x = .2$$

$$x = 20^\circ$$

Score 0: The student gave a completely incorrect response.

Question 26

26 An airplane took off at a constant angle of elevation. After the plane traveled for 25 miles, it reached an altitude of 5 miles, as modeled below.



To the *nearest tenth of a degree*, what was the angle of elevation?

$5^2 + b^2 = 25^2$

$25 + b^2 = 625$

$-25 \qquad -25$

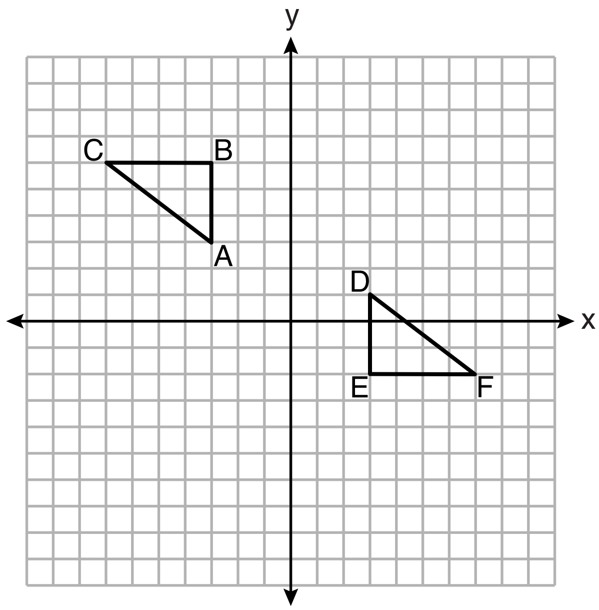
$\sqrt{b^2} = \sqrt{600}$

$b = 24.4$

Score 0: The student gave a completely incorrect response.

Question 27

27 On the set of axes below, $\triangle ABC \cong \triangle DEF$.



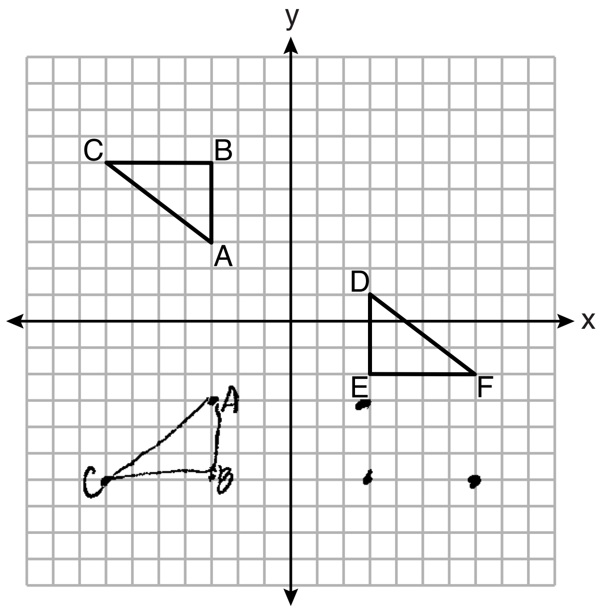
Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.

A reflection over the y-axis then a reflection over y=2.

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

Question 27

27 On the set of axes below, $\triangle ABC \cong \triangle DEF$.



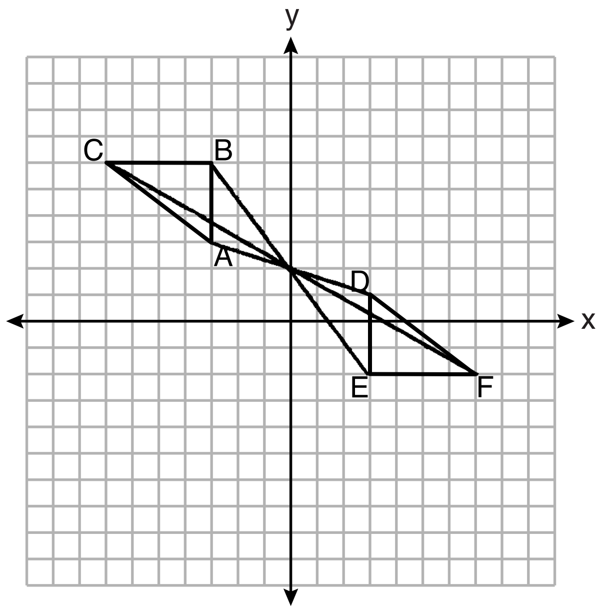
Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.

1. reflection across the X-axis
2. reflection across y-axis
3. translation up 4 units

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

Question 27

27 On the set of axes below, $\triangle ABC \cong \triangle DEF$.



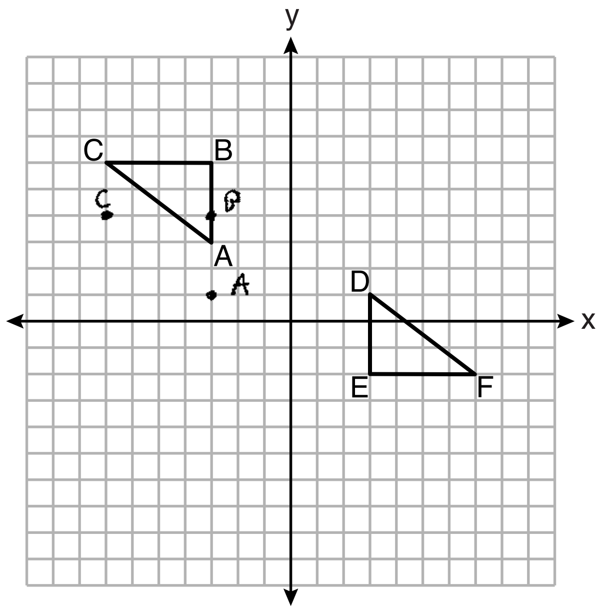
Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.

A rotation of 180° around the point (0,2)

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

Question 27

27 On the set of axes below, $\triangle ABC \cong \triangle DEF$.



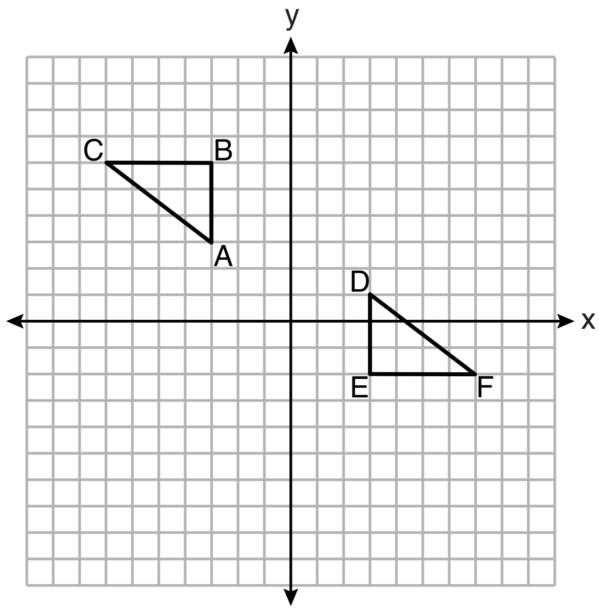
Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.

Translat $\triangle ABC$ down 2 and right 6 then rotate it 180°

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

Question 27

27 On the set of axes below, $\triangle ABC \cong \triangle DEF$.



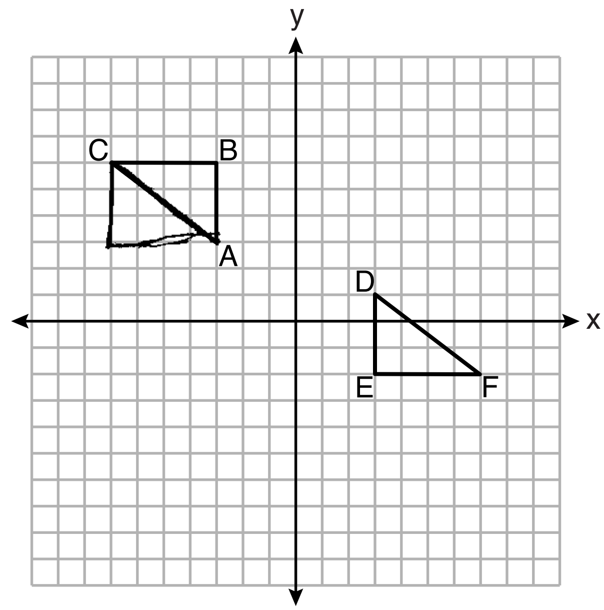
Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.

Rotation of 180°, then a translation 4 units up

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

Question 27

27 On the set of axes below, $\triangle ABC \cong \triangle DEF$.



Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.

$\triangle ABC$ would have to undergo a rotation of 90°, then translated 10 and 5.

Score 0: The student gave a completely incorrect response.

Question 28

28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]

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

$\sqrt{(4-4)^2+(-1+{}^-4)^2}$

$0+25$

$d=\sqrt{25}$

$d=5$

Height

$d=\sqrt{(10+{}^+2)^2+(-1+{}^+1)}$

$d=\sqrt{12^2+0}$

$d=\sqrt{144}$

$d=12$

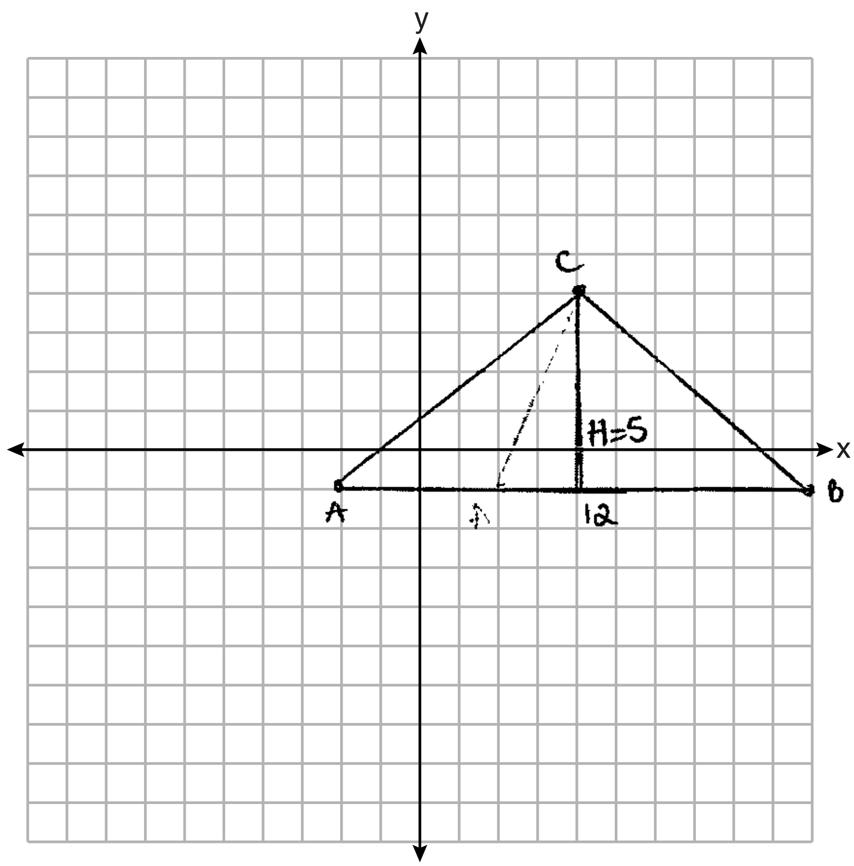
AB

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

$A=\frac{1}{2}(12)(5)$

$A=\frac{1}{2}60$

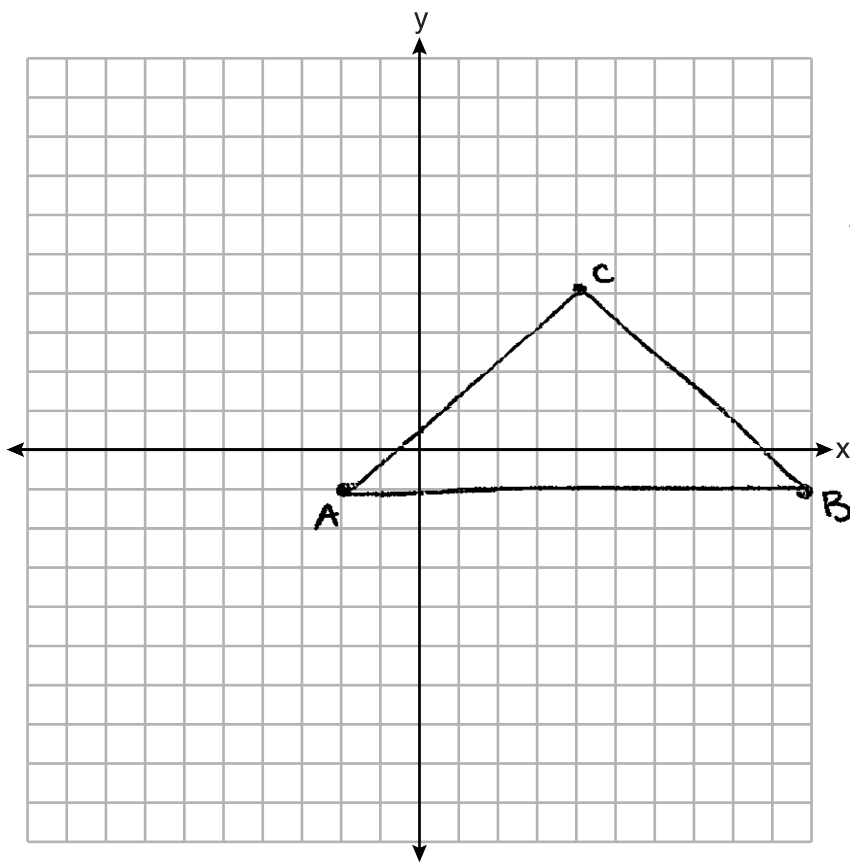
$\boxed{A=30 \text{ units}^2}$



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

Question 28

28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]



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

$A = .5\,(12 \cdot 5)$

$A = .5\,(60)$

$A = 30$

$A = 30$

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

Question 28

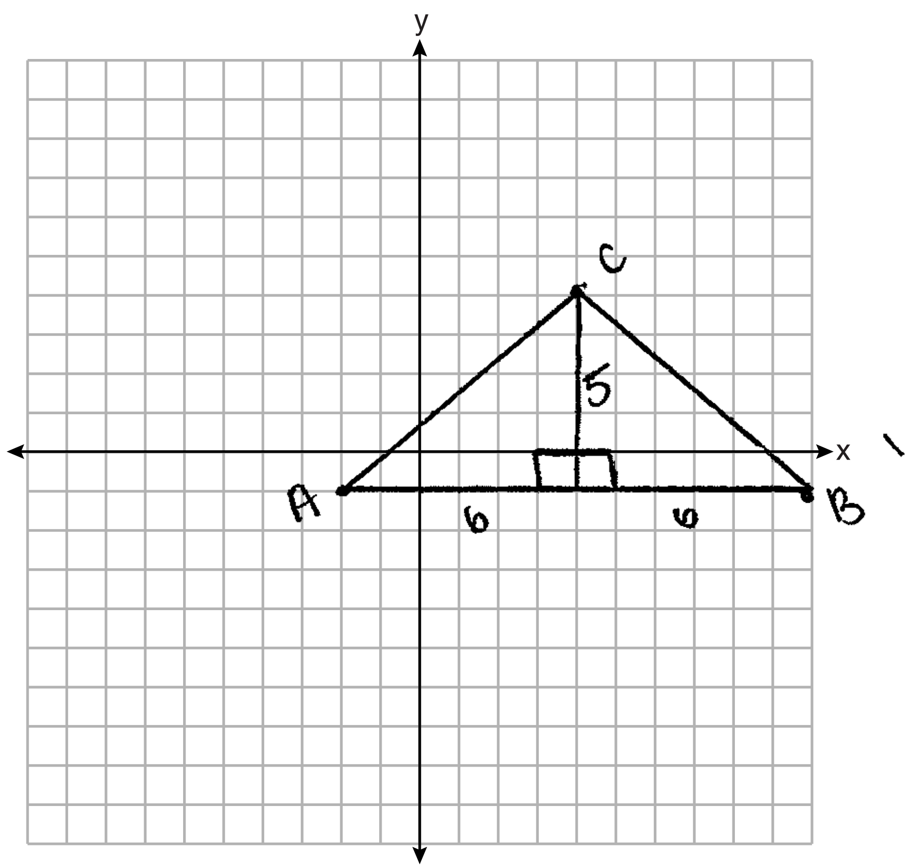
28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]

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

$A = \frac{1}{2}(5)(6)$

$A = 15(2) = 30$

$\boxed{\text{area of } \triangle ABC = 30 \text{ units}^2}$

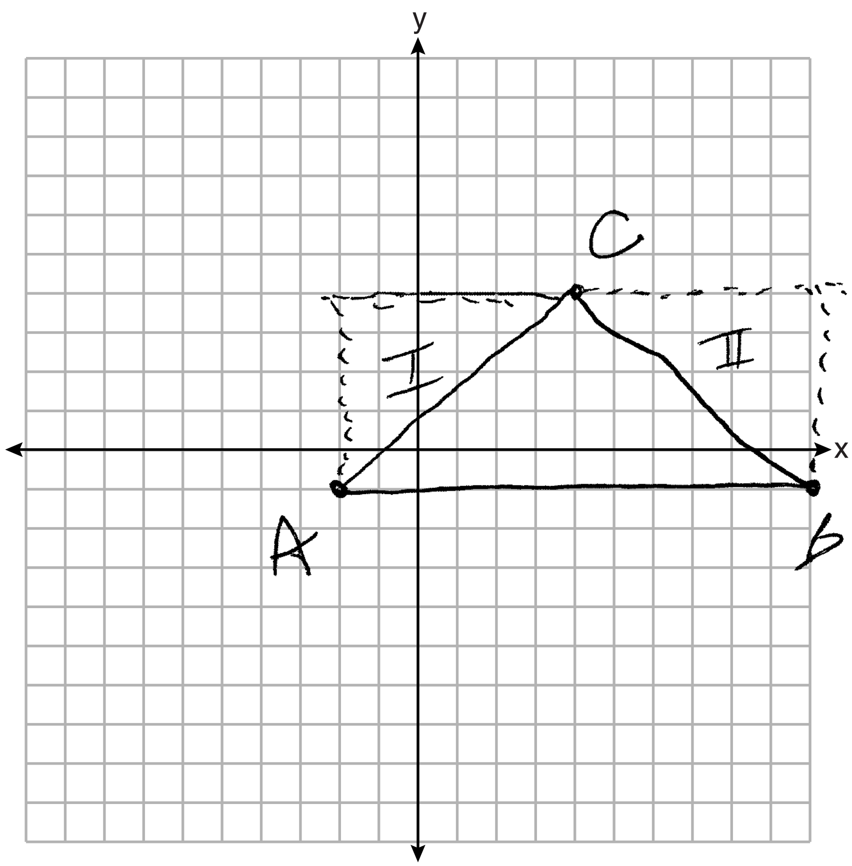


Score 2: The student gave a complete and correct response.

Question 28

28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]

Area of $\triangle ABC = 30$



$A_{Rect} = 5 \cdot 12 = 60$

$A_{I} = \frac{1}{2}(5)(6) = 15$

$A_{II} = \frac{1}{2}(5)(6)$

$A_{\triangle ABC} = \begin{array}{r} 60 \\ -15 \\ -15 \\ \hline 30 \end{array}$

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

Question 28

28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]

$\boxed{60}$

$\sqrt{(-2+10)^2 + (-1 + +1)^2}$

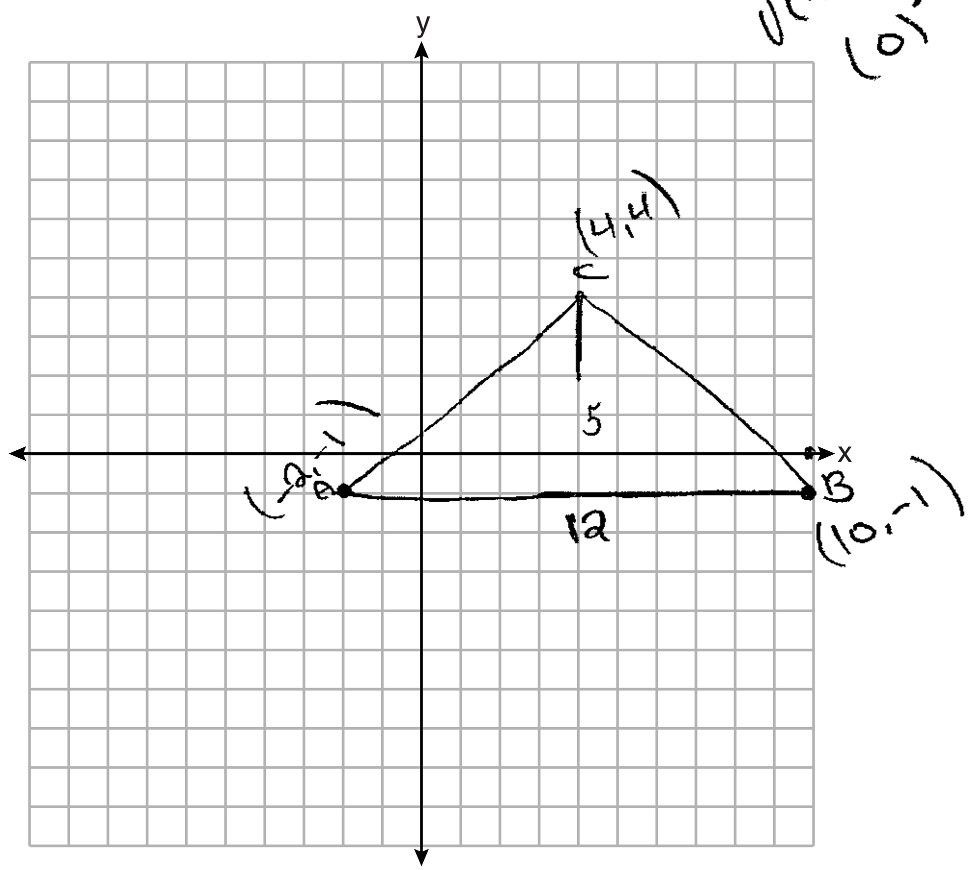
$(-12)^2 + (0)^2$

$\sqrt{144}$

$\begin{array}{r} 12 \\ \times\ 5 \\ \hline 60 \end{array}$

$\sqrt{(4+4)^2 + (4 + +1)^2}$

$(0)^2 \quad (5)$



Score 1: The student made an error by not multiplying the product of the base and height by $\frac{1}{2}$.

Question 28

28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]

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

$\sqrt{(-1-1)^2+(10+2)^2}$

$\sqrt{0+144}$

12

(4, -1)

(4, -4)

$\sqrt{(4-4)^2+(-4-1)^2}$

$\sqrt{9}$

3

~~$AC = \sqrt{(4+1)^2+(4+2)^2}$~~

~~25 + 36~~

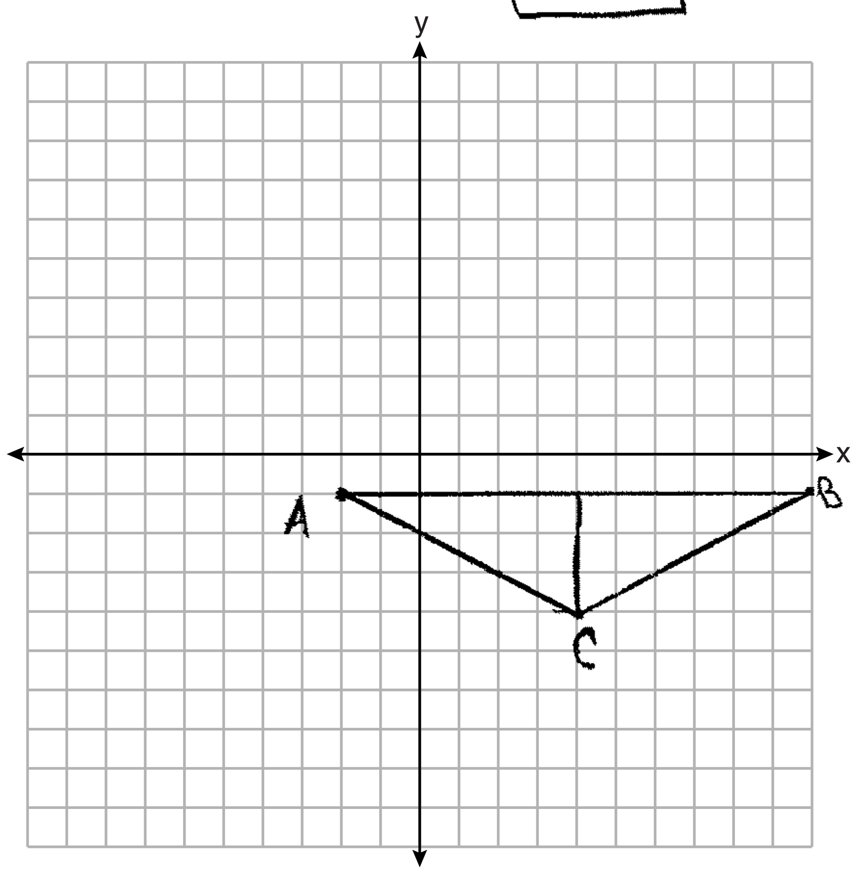
~~$\sqrt{61}$~~

~~7.8~~

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

$A = \frac{1}{2} 12 \cdot 3$

$\boxed{A = 18}$



Score 1: The student graphed $\triangle ABC$ incorrectly, but found the area of the triangle of equal difficulty.

Question 28

28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]

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

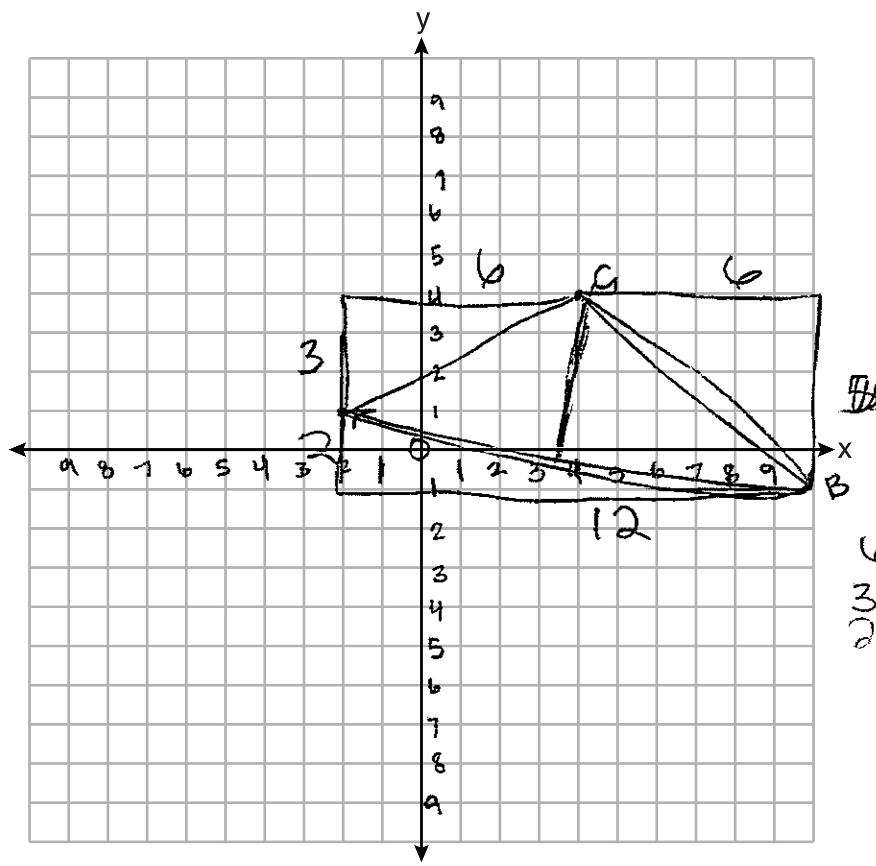
$= \frac{1}{2}(\sqrt{148})($

$3^2 + 6^2 = c^2$

$9 + 12 = c^2$

$21 = c^2$

$\sqrt{21} = c$



$2^2 + 12^2 = c^2$

$4 + 144 = c^2$

$148 = c^2$

$\sqrt{148} = c$

$6^2 + 5^2 = c^2$

$36 + 25 = c^2$

25

$61 = c^2$

$\sqrt{61} = c$

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

Question 28

x_1 y_1 x_2 y_2

28 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]

$A_\Delta = \frac{1}{2}(b \cdot h)$

$d = \sqrt{(10-(-2))^2 + (-1-(-1))^2}$

$d = \sqrt{144}$

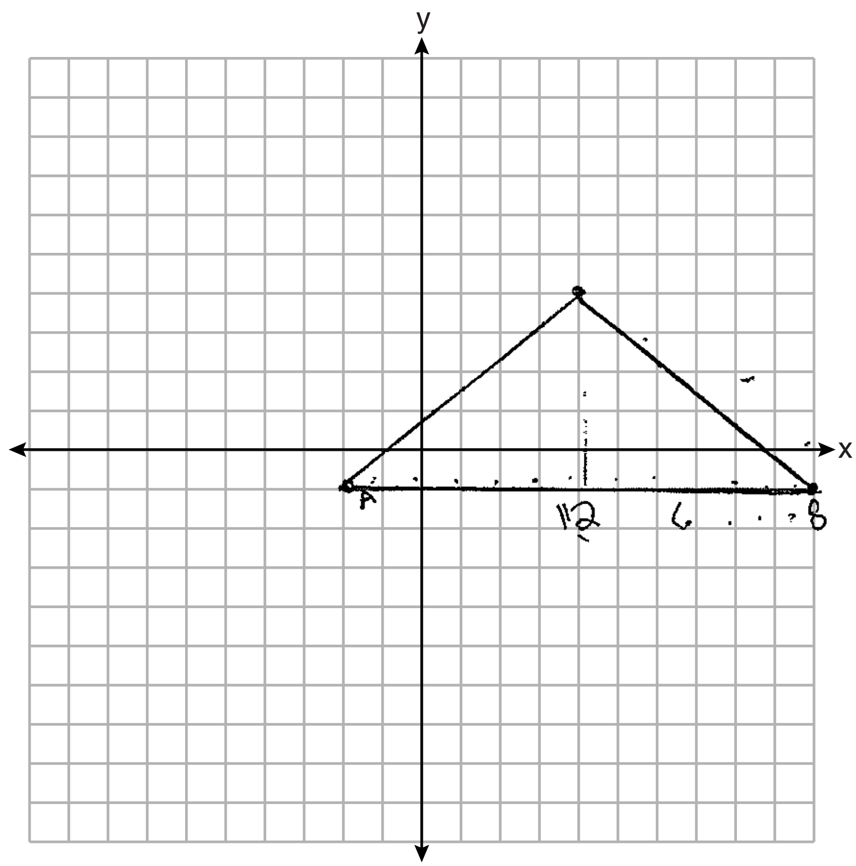
$d = 12$

$d = \sqrt{(4-10)^2 + (4-(-1))^2}$

$d = \sqrt{36+3}$

$d = \sqrt{39} =$

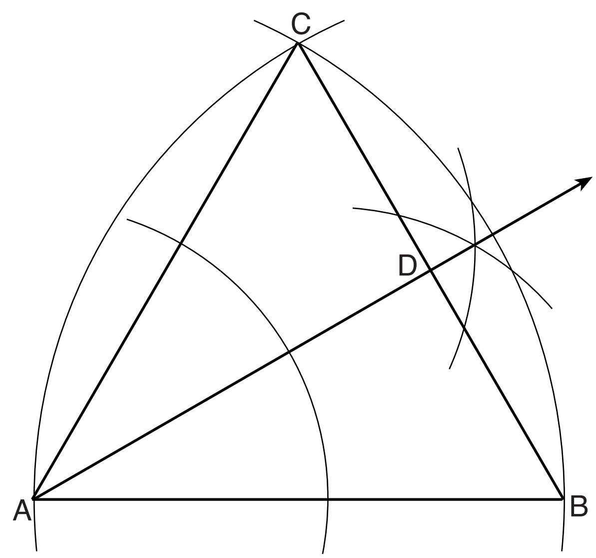
A_Δ



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

Question 29

29 Using the construction below, state the degree measure of $\angle CAD$. Explain why.



1. Δ CAB is an equilateral triangle because all its sides are the radii of congruent circles.

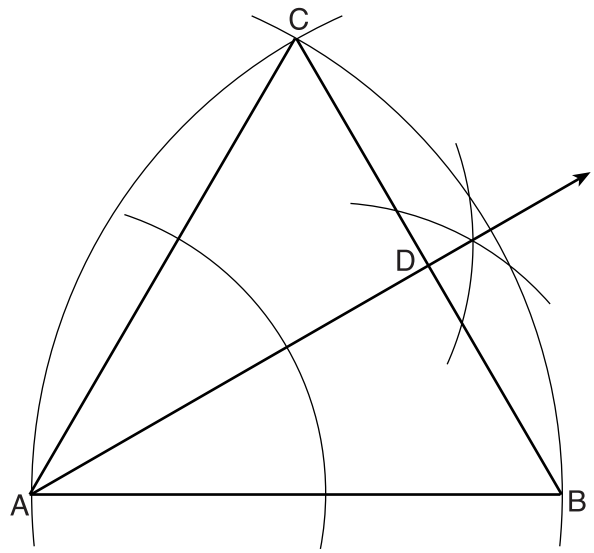
2. All the angle measures in an equilateral triangle are 60°.

3. <CAD is 30° because an angle bisector was constructed, and angle bisectors cut an angle into 2 congruent pieces, so 60° ÷ 2 = 30°

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

Question 29

29 Using the construction below, state the degree measure of $\angle CAD$. Explain why.



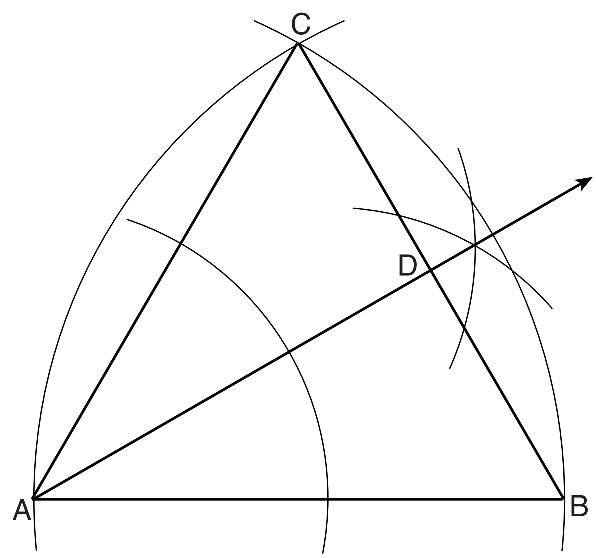
m∠CAD is 30° because

∡CAB is 60° because △ABC is equilateral. Then ∡CAB was cut in half making ∡CAD equal to 30°

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

Question 29

29 Using the construction below, state the degree measure of $\angle CAD$. Explain why.



ΔABC is equilaterial

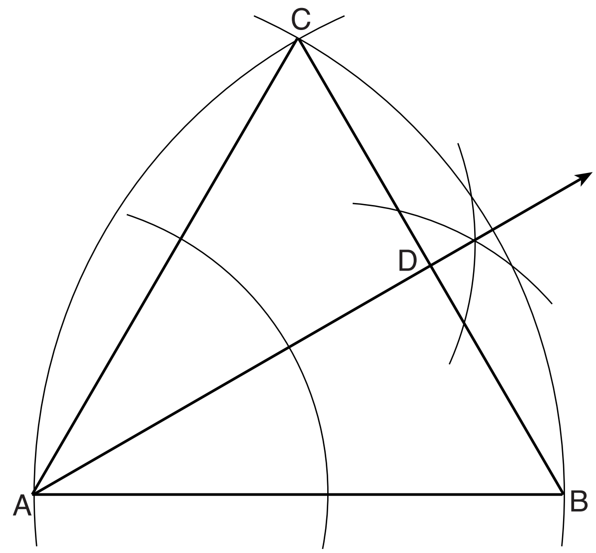
$\angle CAD = \frac{1}{2} \angle CAB$

$\angle CAD$ is half of $\angle CAB$ because it was bisected

Score 1: The student wrote a correct explanation, but did not state that the angle measures 30°.

Question 29

29 Using the construction below, state the degree measure of $\angle CAD$. Explain why.

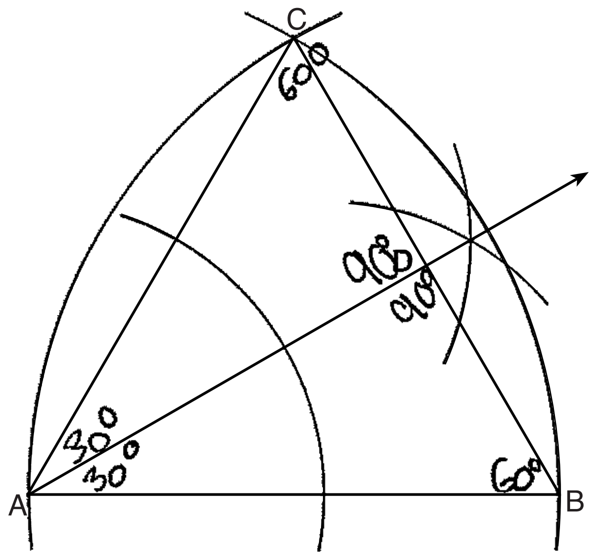


This is a 30° angle because the compass was open to a little more than half of $\overline{AB}$.

Score 1: The student stated that the angle measures 30°, but the explanation is incorrect.

Question 29

29 Using the construction below, state the degree measure of $\angle CAD$. Explain why.

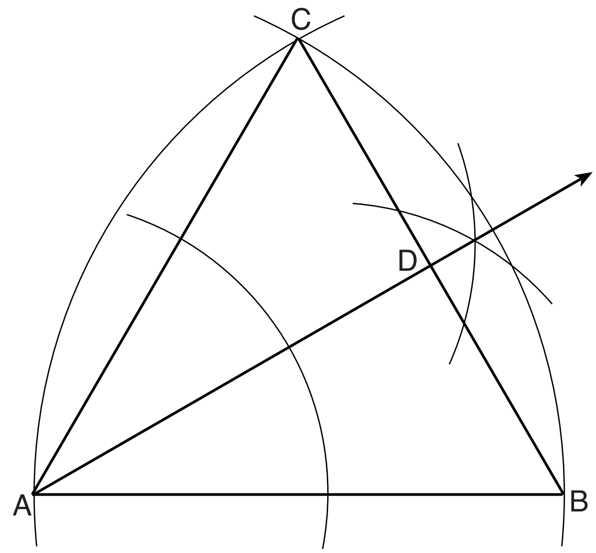


Its an equalateral triangle
So ∠A, ∠C and ∠B is 60.

Score 1: The student stated that the angle measures 30°, but the explanation is incomplete.

Question 29

29 Using the construction below, state the degree measure of $\angle CAD$. Explain why.

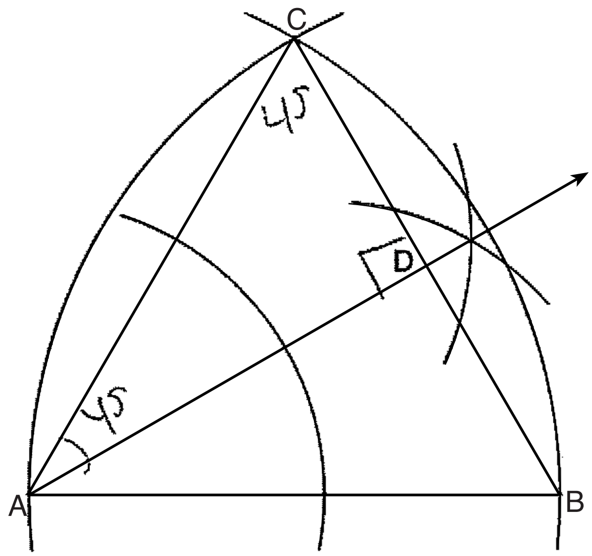


60°. It is an equilateral triangle so all ∠'s = 60°.

Score 1: The student wrote an incomplete response.

Question 29

29 Using the construction below, state the degree measure of $\angle CAD$. Explain why.

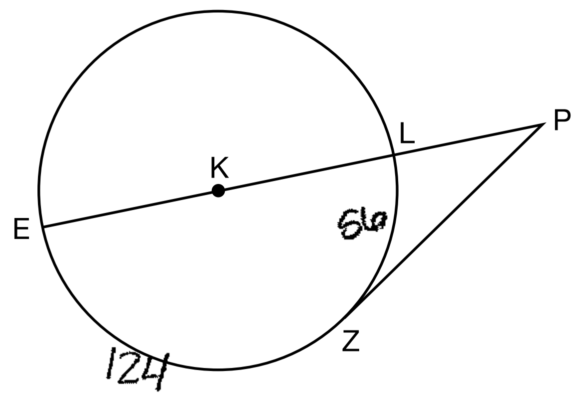


$\angle CAD$ is 45° b/c $\triangle CAD$
is a 45, 45, 90 triangle

Score 0: The student gave a completely incorrect response.

Question 30

30 In the diagram below of circle K, secant $\overline{PLKE}$ and tangent $\overline{PZ}$ are drawn from external point P.



If $m\widehat{LZ} = 56°$, determine and state the degree measure of angle P.

$m\angle P = \frac{1}{2}(\widehat{EZ} - \widehat{ZL})$

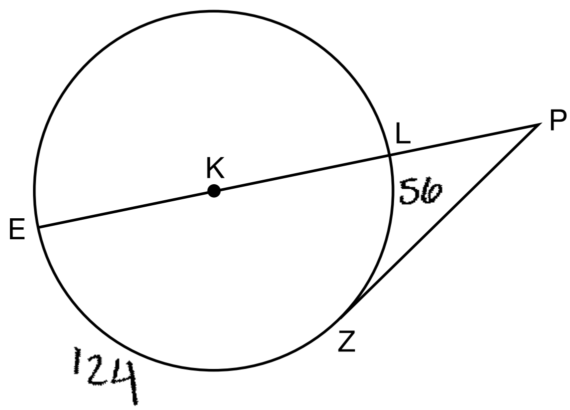
$m\angle P = \frac{1}{2}(124 - 56)$

$m\angle P = \frac{1}{2}(68)$

$m\angle P = 34$

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

30 In the diagram below of circle K, secant $\overline{PLKE}$ and tangent $\overline{PZ}$ are drawn from external point P.



If $m\widehat{LZ} = 56°$, determine and state the degree measure of angle P.

$P = \frac{1}{2}(124 - 56)$

$P = \frac{1}{2}(68)$

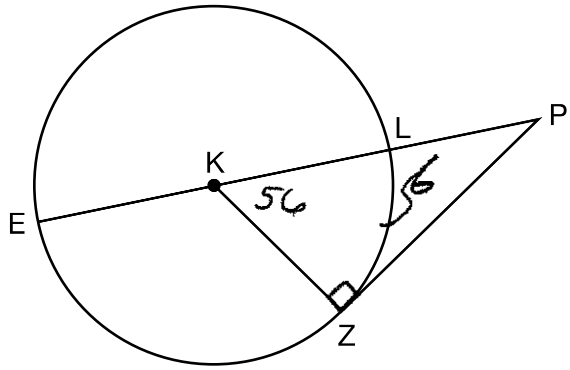
$P = 34°$

$m\angle P = 34°$

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

Question 30

30 In the diagram below of circle K, secant $\overline{PLKE}$ and tangent $\overline{PZ}$ are drawn from external point P.



If $m\widehat{LZ} = 56°$, determine and state the degree measure of angle P.

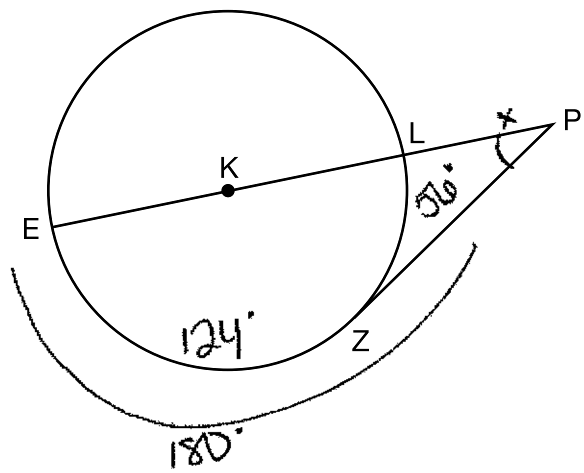
$$\begin{array}{r} \cancel{90} \\ -56 \\ \hline 34 \end{array}$$

$$\boxed{m\angle P = 34}$$

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

Question 30

30 In the diagram below of circle K, secant $\overline{PLKE}$ and tangent $\overline{PZ}$ are drawn from external point P.



180
- 56
124

If $m\widehat{LZ} = 56°$, determine and state the degree measure of angle P.

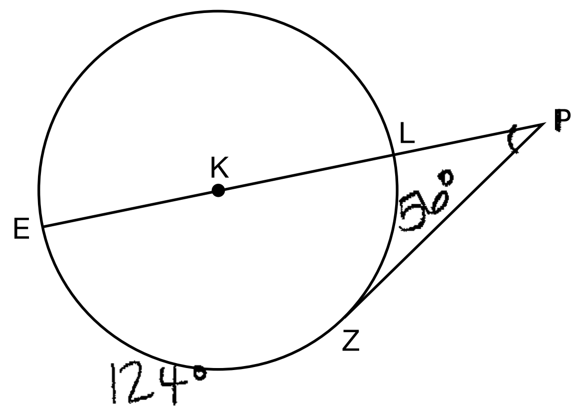
$$2\overline{)124}$$ 62

angle P has 62°

Score 1: The student made an error by thinking $m\angle P = \frac{1}{2}(m\widehat{EZ})$.

Question 30

30 In the diagram below of circle K, secant $\overline{PLKE}$ and tangent $\overline{PZ}$ are drawn from external point P.



$$\begin{array}{r} 180 \\ -\ 56 \\ \hline 124° \end{array}$$

If $m\widehat{LZ} = 56°$, determine and state the degree measure of angle P.

$m\angle P$ = major arc − minor arc

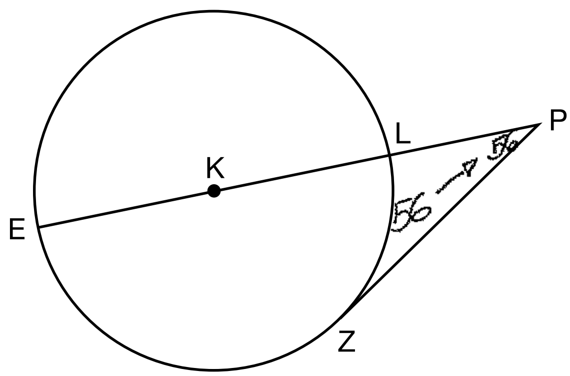
$m\angle P = 124 - 56$

$\boxed{m\angle P = 68°}$

Score 1: The student made an error by thinking $m\angle P = m\widehat{EZ} - m\widehat{LZ}$.

Question 30

30 In the diagram below of circle K, secant $\overline{PLKE}$ and tangent $\overline{PZ}$ are drawn from external point P.

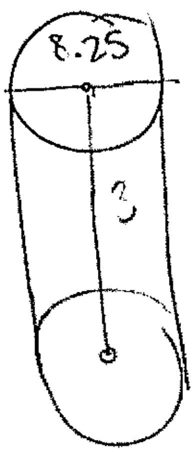


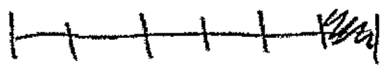
If $m\widehat{LZ} = 56°$, determine and state the degree measure of angle P.

measure of angle P → 56°

Score 0: The student gave a completely incorrect response.

31 A large water basin is in the shape of a right cylinder. The inside of the basin has a diameter of $8\frac{1}{4}$ feet and a height of 3 feet. Determine and state, to the *nearest cubic foot*, the number of cubic feet of water that it will take to fill the basin to a level of $\frac{1}{2}$ foot from the top.





1/6 of basin

$V = \pi r^2 h$

$V = \pi(4.125)^2(2.5)$

$V = 42.5390625\pi$

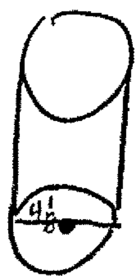
$V = 134 \text{ ft}^3$

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

Question 31

31 A large water basin is in the shape of a right cylinder. The inside of the basin has a diameter of $8\frac{1}{4}$ feet and a height of 3 feet. Determine and state, to the *nearest cubic foot*, the number of cubic feet of water that it will take to fill the basin to a level of $\frac{1}{2}$ foot from the top.

$V=\pi r^2 h$



$V=\pi\, 4\frac{1}{8}^2 \cdot 3$

$V=160.3684879489$

$V=\pi\, 4\frac{1}{8}^2 \cdot .5$

$.5 \quad V=26.7280812481$

$-$

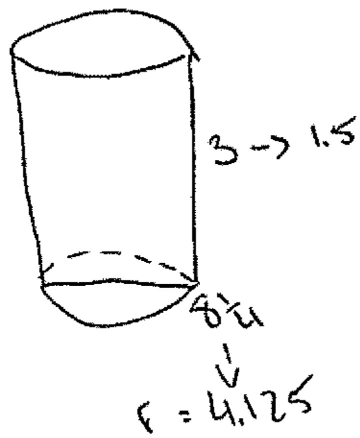
134

$134\ \text{feet}^3$

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

Question 31

31 A large water basin is in the shape of a right cylinder. The inside of the basin has a diameter of $8\frac{1}{4}$ feet and a height of 3 feet. Determine and state, to the *nearest cubic foot*, the number of cubic feet of water that it will take to fill the basin to a level of $\frac{1}{2}$ foot from the top.



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

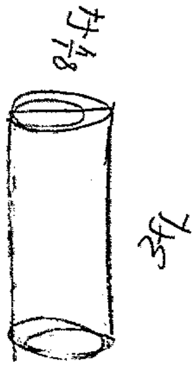
$V = \pi(4.125)^2(1.5)$

$V \approx 80 \text{ ft}^3$

Score 1: The student used a height of 1.5 feet to find the volume of the water in the basin.

Question 31

31 A large water basin is in the shape of a right cylinder. The inside of the basin has a diameter of $8\frac{1}{4}$ feet and a height of 3 feet. Determine and state, to the *nearest cubic foot*, the number of cubic feet of water that it will take to fill the basin to a level of $\frac{1}{2}$ foot from the top.



$V = \pi r^2 h$

$\pi 4.125^2 (3ft)$

$V = 160.4$ ft.

$3 \div \frac{1}{2} = 6$

$6\overline{)160.4}$

$\boxed{= 26.7 \text{ ft}^3}$

Score 1: The student found the volume of the whole cylinder and the volume of the empty space, but did not subtract to find the volume of water.

Question 31

31 A large water basin is in the shape of a right cylinder. The inside of the basin has a diameter of $8\frac{1}{4}$ feet and a height of 3 feet. Determine and state, to the *nearest cubic foot*, the number of cubic feet of water that it will take to fill the basin to a level of $\frac{1}{2}$ foot from the top.

$V = \pi r^3 h$

$V = \pi \left(\frac{33}{8}\right)^3 (2.5)$

$V = 551 \text{ ft}^3$

$d = 8\frac{1}{4}$

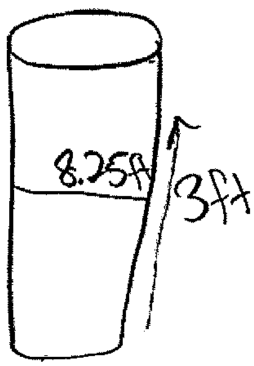
$r = \frac{33}{8}$

Score 1: The student made an error by cubing the radius to find the volume of the water in the basin.

Question 31

31 A large water basin is in the shape of a right cylinder. The inside of the basin has a diameter of $8\frac{1}{4}$ feet and a height of 3 feet. Determine and state, to the *nearest cubic foot*, the number of cubic feet of water that it will take to fill the basin to a level of $\frac{1}{2}$ foot from the top.

$\boxed{\text{About 160 ft}}$



$V = \pi r^2 h$

$V = \pi(4.125)^2(3)$

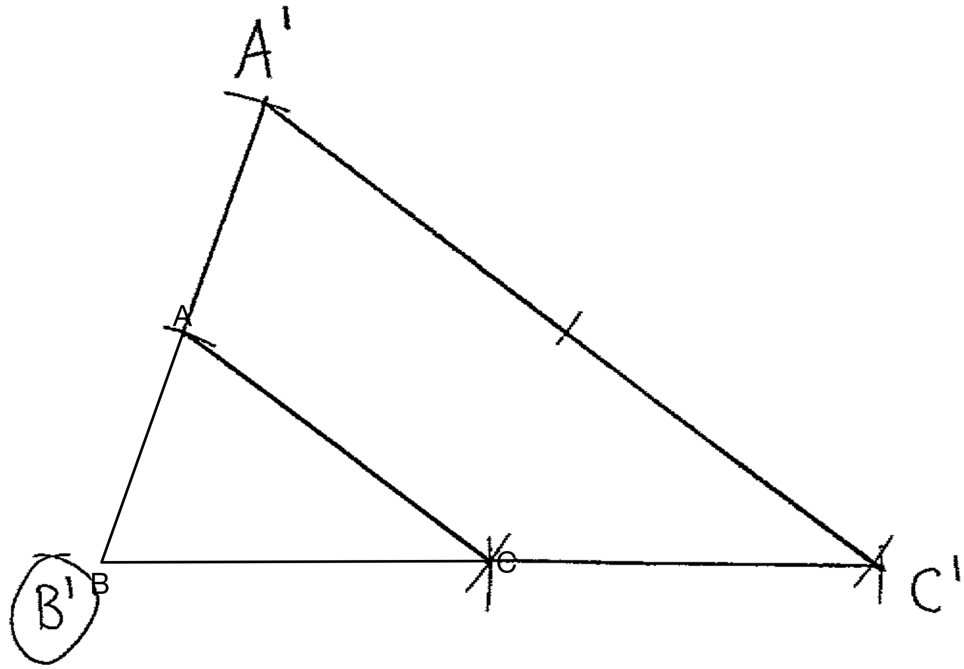
$V = \pi(17.0156)(3)$

$V = 160\text{ ft}$

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

Question 32

32 Triangle ABC is shown below. Using a compass and straightedge, construct the dilation of $\triangle ABC$ centered at B with a scale factor of 2.
[Leave all construction marks.]



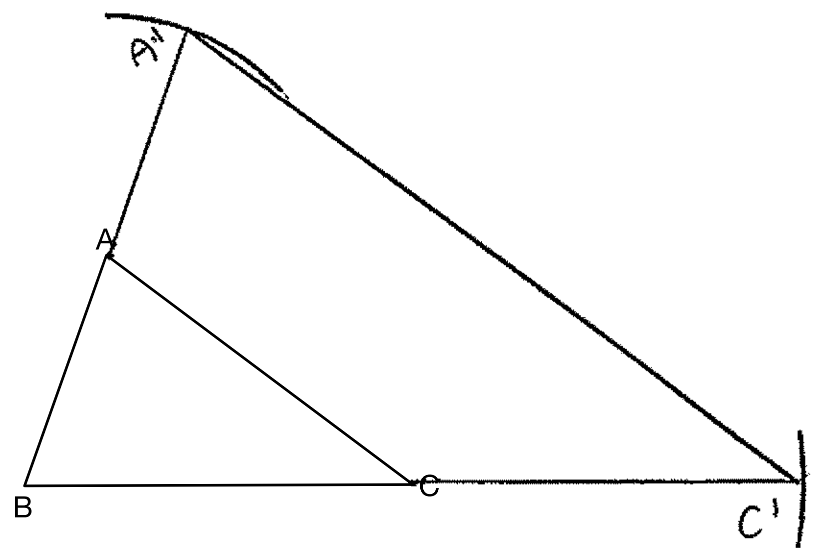
Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

yes, $\triangle A'B'C'$ is similar to $\triangle ABC$!
A dialation of 2 means that all sides are multiplied by 2!
similar $\triangle$'s have side lengths that are in proportion.

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

Question 32

32 Triangle *ABC* is shown below. Using a compass and straightedge, construct the dilation of $\triangle ABC$ centered at *B* with a scale factor of 2.
[Leave all construction marks.]



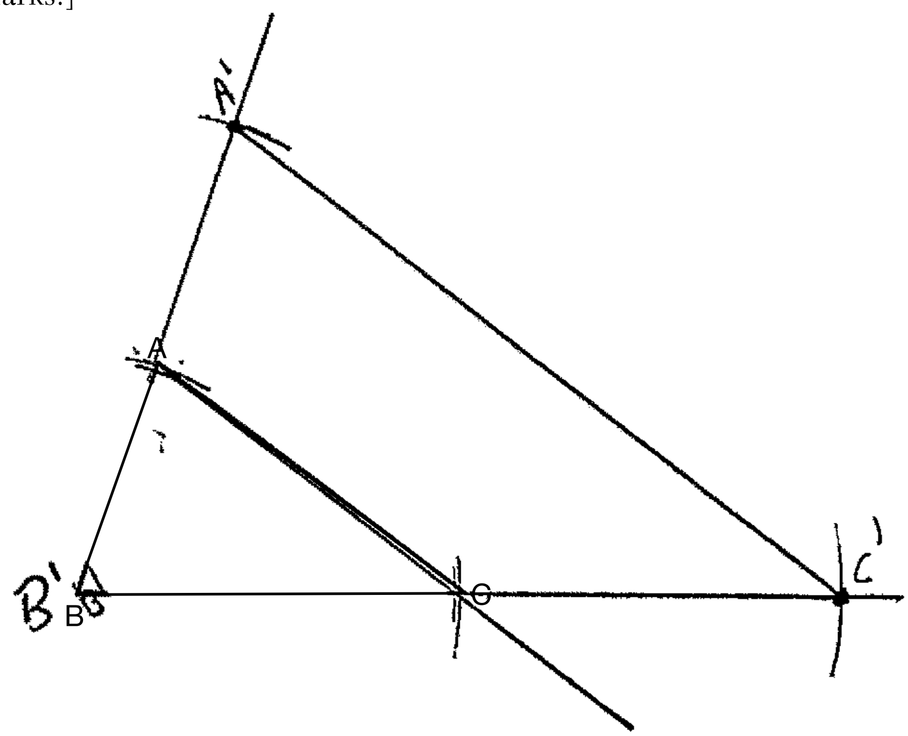
Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

The image of $\triangle$ABC is similar to the triangle because since a dilation isn't a rigid motion, it preserves the angle measures but creates proportional side lengths. Similar triangles have congruent angles and proportional side lengths, meaning that a dilation creates an image similar to the original triangle.

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

Question 32

32 Triangle ABC is shown below. Using a compass and straightedge, construct the dilation of $\triangle ABC$ centered at B with a scale factor of 2.
[Leave all construction marks.]



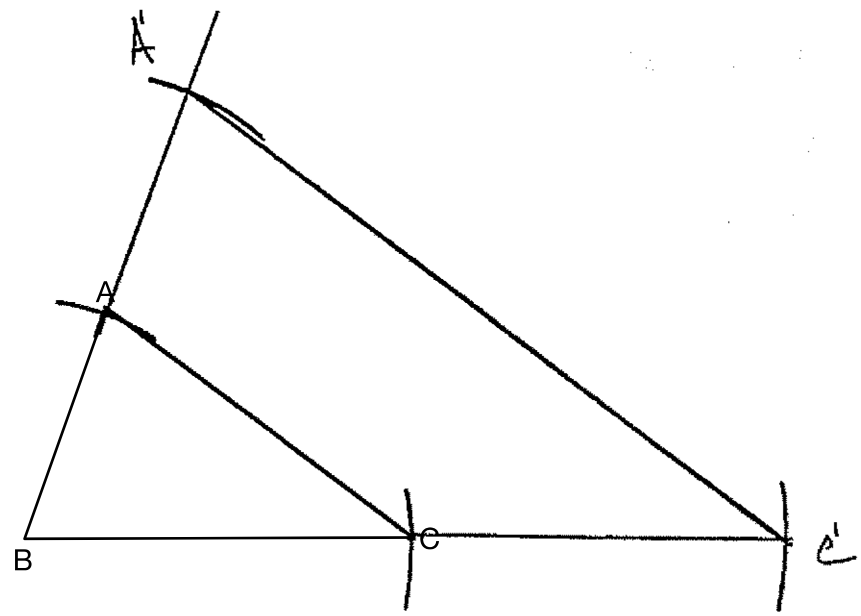
Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

Yes because ~~th~~ a diation preserves angle measure, so thi could be similar by the AA~thm

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

Question 32

32 Triangle *ABC* is shown below. Using a compass and straightedge, construct the dilation of $\triangle ABC$ centered at *B* with a scale factor of 2.
[Leave all construction marks.]



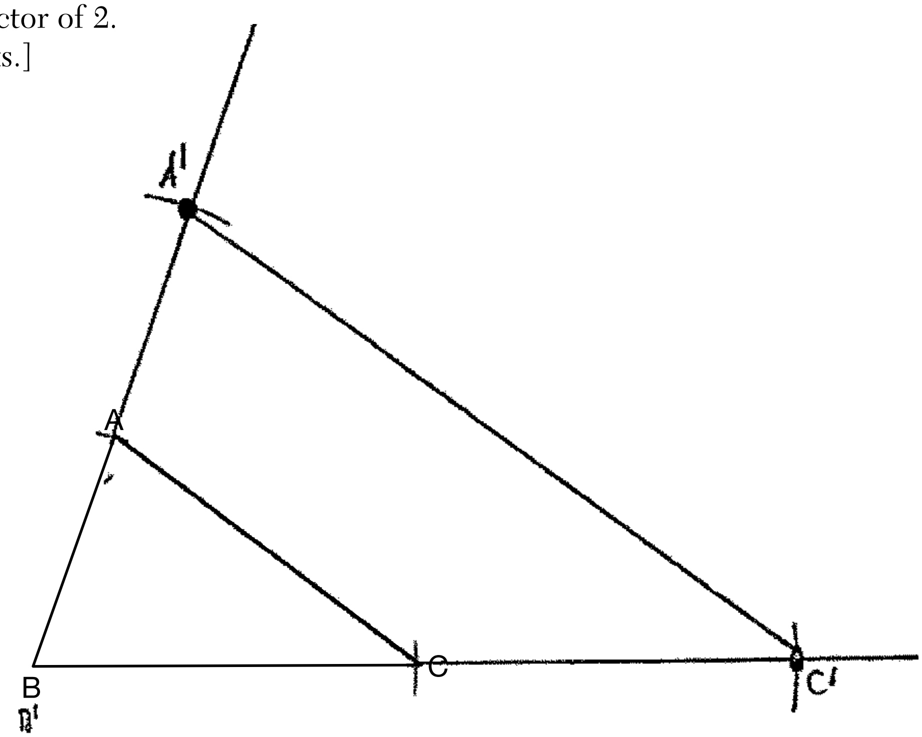
Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

yes becarse a dialation is not isometric, it doesnt change sides. Also, the sides would be porportial.

Score 3: The student wrote a partially incorrect explanation by stating that the dilation doesn't change the sides.

Question 32

32 Triangle ABC is shown below. Using a compass and straightedge, construct the dilation of $\triangle ABC$ centered at B with a scale factor of 2.
[Leave all construction marks.]

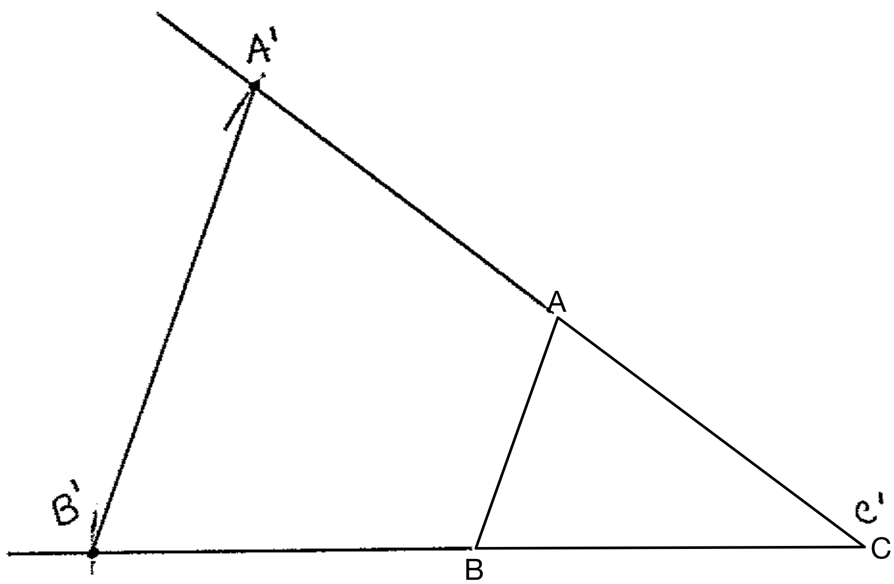


Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

Score 2: The student made a correct construction, but no further correct work was shown.

Question 32

32 Triangle ABC is shown below. Using a compass and straightedge, construct the dilation of $\triangle ABC$ centered at B with a scale factor of 2.
[Leave all construction marks.]



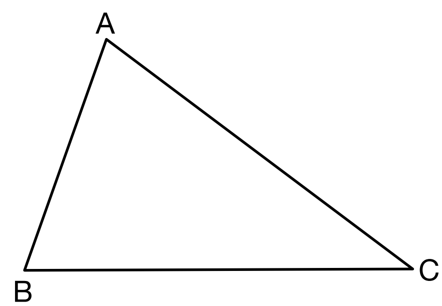
Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

$\triangle ABC$ is similar to $\triangle A'B'C'$ because dilations preserve shape.

Score 1: The student made an appropriate construction centered at a point other than B. The student wrote an incorrect explanation.

Question 32

32 Triangle ABC is shown below. Using a compass and straightedge, construct the dilation of $\triangle ABC$ centered at B with a scale factor of 2.
[Leave all construction marks.]



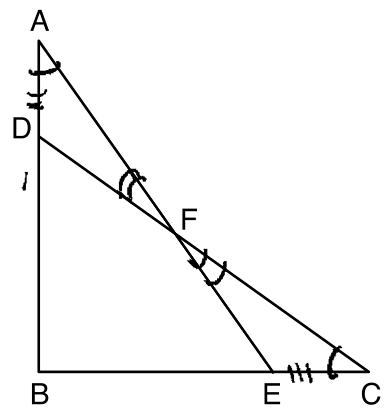
Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

No. Dilation is the only rigid motion that does not preserve size of a image. This transformation does not lead the triangle to be similar or remain, the same as the original triangle.

Score 0: The student gave a completely incorrect response.

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.



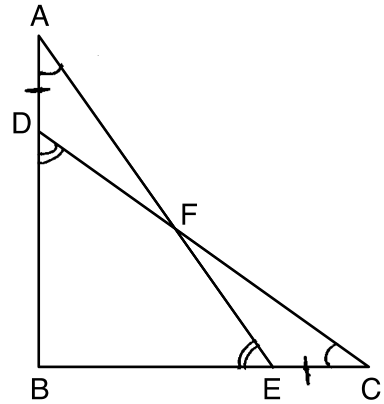
Prove: $\triangle AFD \cong \triangle CFE$

Statement	Reason
1. $\triangle ABE \cong \triangle CBD$	1. Given
2. $\angle A \cong \angle C$	2. CPCTC
3. $\angle AFD \cong \angle CFE$	3. Vertical $\angle$s are $\cong$.
4. $\overline{AB} \cong \overline{CB}$; $\overline{DB} \cong \overline{EB}$	4. CPCTC
5. $\overline{AD} \cong \overline{CE}$	5. Subtraction (4)
6. $\triangle AFD \cong \triangle CFE$	6. AAS

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

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.



Prove: $\triangle AFD \cong \triangle CFE$

① $\triangle ABE \cong \triangle CBD$
Given

② $\angle A \cong \angle C$
CPCTC

③ $\angle BDC \cong \angle BEA$
CPCTC

④ $\angle ADF; \angle BDC$
$\angle CEF; \angle BEA$
Both pairs are linear pairs and supplement angles

⑤ $\angle ADF \cong \angle CEF$
supplements of $\cong$ angles are $\cong$

⑥ $\overline{AB} \cong \overline{CB}$
CPCTC

⑦ $\overline{BD} \cong \overline{BE}$
CPCTC

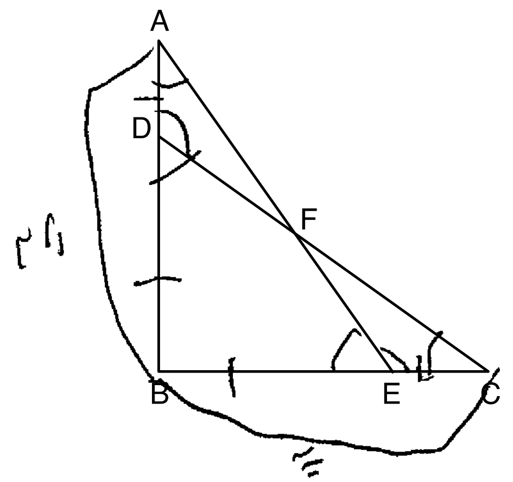
⑧ $\overline{AD} \cong \overline{CE}$
subtraction

$\triangle AFD \cong \triangle CFE$
ASA

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

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.



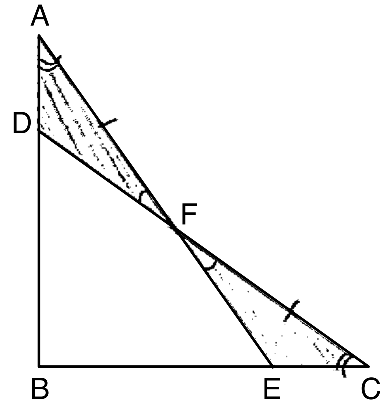
Prove: $\triangle AFD \cong \triangle CFE$

Statement	Reason
1. $\triangle ABE \cong \triangle CBD$	1. Given
2. $\angle A \cong \angle C$	2. CPCTC
3. $\angle BDC \cong \angle BEA$	3. CPCTC
4. $\angle ADF \cong \angle CEF$	4. They are supplements of two $\cong$ angles so they must be $\cong$
5. $\overline{AB} \cong \overline{CB}$	5. CPCTC
6. $\overline{BD} \cong \overline{BE}$	6. CPCTC
7. $\overline{AD} \cong \overline{CE}$	7. subtraction
8. $\triangle AFD \cong \triangle CFE$	8. ASA postulate

Score 3: The student is missing a statement and reason to prove $\angle ADF \cong \angle CEF$.

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.



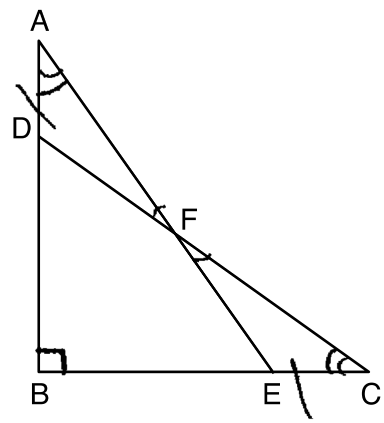
Prove: $\triangle AFD \cong \triangle CFE$

1. $\triangle ABE \cong \triangle CBD$	1. Given
2. $\angle A \cong \angle C$	2. CPCTC
3. $\angle AFD$ & $\angle CFE$ vertical $\angle$s	3. vertical $\angle$ definition
4. $\angle AFD \cong \angle CFE$	4. vertical $\angle$s are $\cong$
5. $\overline{AE} \cong \overline{CD}$	5. CPCTC
6. $\overline{AF} \cong \overline{FC}$	6. segment subtraction
7. $\triangle AFD \cong \triangle CFE$	7. ASA (2,4,6)

Score 2: The student wrote two correct statements and reasons, but two statements and/or reasons are missing or incorrect.

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.



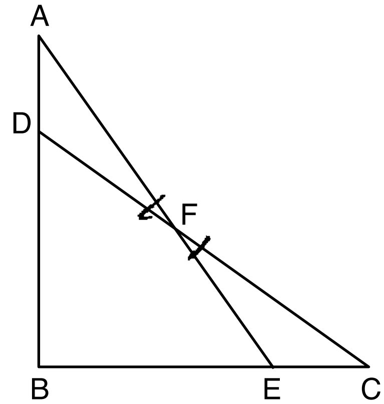
Prove: $\triangle AFD \cong \triangle CFE$

Statements:	Reasons:
1. $\triangle ABE \cong \triangle CBD$	1. Given
A 2. $\angle B \cong \angle B$	2. Reflexive Property.
A 3. $\angle AFD \cong \angle CFE$	3. Vertical angles are congruent
A 4 $\angle A \cong \angle C$	4. CPCTC
S 5. $BA - DB \cong BC - BE$	5. Subtraction postulate
6. $\triangle AfD \cong \triangle CFE$	6. AAS

Score 2: The student wrote two correct statements and reasons, but is missing two statements and reasons to prove $\overline{AD} \cong \overline{CE}$.

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.



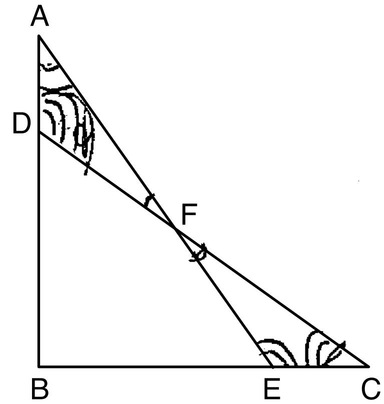
Prove: $\triangle AFD \cong \triangle CFE$

Statement	Reason
1.) $\triangle ABE \cong \triangle CBD$	1.) Given.
2.) $\angle AFD \cong \angle CFE$	2.) Vertical ∠'s are ≅.
3.) $\overline{DFC} \cong \overline{EFA}$	3.) CPCTC
4.) $\overline{DC} - \overline{FC} = DF$ $AE - FE = AF$ $DC = DF = FC$ $AE - AF = FE$	4.) Subraction property
5.) $AF \cong FC$ $EF \cong DF$	5.) Substitution
6.) $\triangle AFD \cong \triangle CFE$	6.) SAS.

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

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.



Prove: $\triangle AFD \cong \triangle CFE$

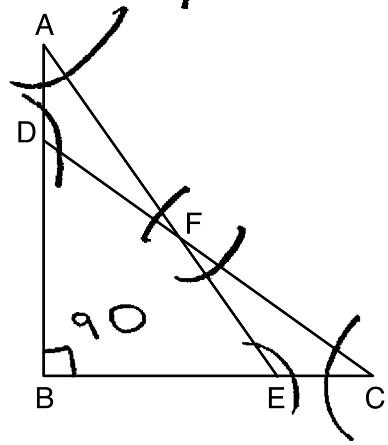
$\angle AFD \cong \angle CFE$	vertizle $\angle$'s
$\angle FAD \cong \angle FED$	opposite interior $\angle$'s
$\angle ADF \cong \angle FCE$	opposite interior $\angle$'s
$\triangle AFD \cong \triangle CFE$	SSS

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

Question 33

33 In the diagram below, $\triangle ABE \cong \triangle CBD$.

A SA



ABE = CBD

A = C
B = B
E = D

Prove: $\triangle AFD \cong \triangle CFE$

Statement	reason
$\triangle ABE \cong \triangle CBD$	Given
$B \cong B$	reflexive property. its its own $\angle = 90°$ right triangle
$A \cong C$ $B \cong B$ $E \cong D$	supplementary $\angle$'s $\triangle ABE \cong \triangle CBD$
$F \cong F$	reflexive property
$\overline{AF} = \overline{CF}$ $\overline{DF} \cong \overline{EF}$	F is intersection point for all line segments
$\triangle AFD \cong \triangle CFE$	ASA

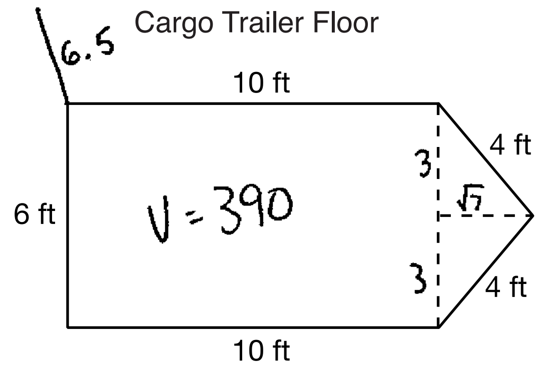
Score 0: The student did not show enough correct relevant work to receive any credit.

Question 34

34 A cargo trailer, pictured below, can be modeled by a rectangular prism and a triangular prism. Inside the trailer, the rectangular prism measures 6 feet wide and 10 feet long. The walls that form the triangular prism each measure 4 feet wide inside the trailer. The diagram below is of the floor, showing the inside measurements of the trailer.

Cargo Trailer

Cargo Trailer Floor



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

$9 = 16$

$-9 \quad -9$

$\sqrt{x^2} = \sqrt{7}$

$x = \sqrt{7}$

If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$10 \times 6 \times 6.5 = 390$

$2\left(\frac{1}{2}(3)(\sqrt{7})(6.5)\right)$

51.59215057

441.5921

442 ft^3

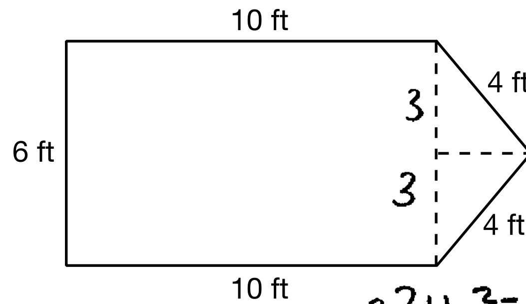
Score 4: The student gave a complete and correct response.

Question 34

34 A cargo trailer, pictured below, can be modeled by a rectangular prism and a triangular prism. Inside the trailer, the rectangular prism measures 6 feet wide and 10 feet long. The walls that form the triangular prism each measure 4 feet wide inside the trailer. The diagram below is of the floor, showing the inside measurements of the trailer.

Cargo Trailer

Cargo Trailer Floor



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

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

$\sqrt{x^2}=\sqrt{7}$

$x=2.64575131$

If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$V_{rect\measuredangle} = lwh$

$= 10 \cdot 6 \cdot 6.5$

$= 390$

$V_{tri\measuredangle} = Bh$

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

$= (\frac{1}{2}(6 \cdot 2.64575131))(6.5)$

$= 51.59215056$

$V + V = 441.5921506$

442 ft^3

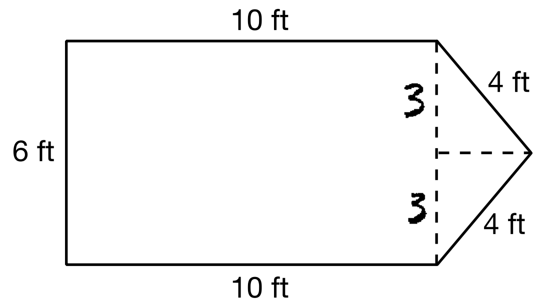
Score 4: The student gave a complete and correct response.

Question 34

34 A cargo trailer, pictured below, can be modeled by a rectangular prism and a triangular prism. Inside the trailer, the rectangular prism measures 6 feet wide and 10 feet long. The walls that form the triangular prism each measure 4 feet wide inside the trailer. The diagram below is of the floor, showing the inside measurements of the trailer.

Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$a^2 + 3^2 = 4^2$

$a^2 + 9 = 16$
$-9 \quad -9$

$\sqrt{a^2} = \sqrt{7}$

$a = 2.65$

$A = b \cdot h$

$A = 6 \cdot 10$

$A = 60$

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

$A = \frac{1}{2}\, 6 \cdot 2.65$

$A = 7.95$

67.95
× 6.50

$V = 442 ft^3$

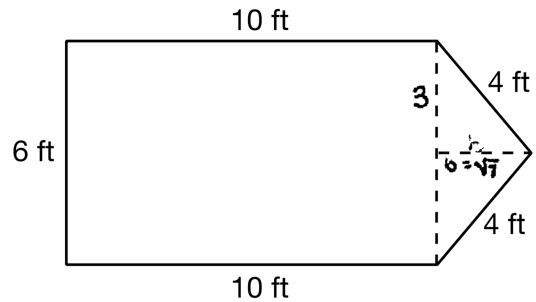
Score 4: The student gave a complete and correct response.

Question 34

34 A cargo trailer, pictured below, can be modeled by a rectangular prism and a triangular prism. Inside the trailer, the rectangular prism measures 6 feet wide and 10 feet long. The walls that form the triangular prism each measure 4 feet wide inside the trailer. The diagram below is of the floor, showing the inside measurements of the trailer.

Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

rectangular prism $V = Bh$ $V = 6 \times 6.5 \times 10 = 390 \text{ ft}^3$

triangular prism $V = Bh$ $V = \frac{1}{2} \cdot 6 \times \sqrt{7} \times 6.5 = 8.598691761 + 390 =$

398.5986918

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

$3^2 + b^2 = 4^2$

$9 + b^2 = 16$

$-9 \quad -9$

$b^2 = 7$

$b = \sqrt{7}$

Volume of the trailor:
399

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

Question 34

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Cargo Trailer

Cargo Trailer Floor

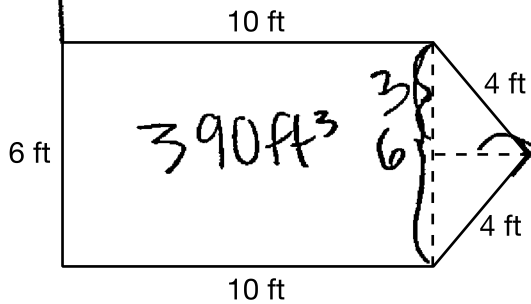
$3^2+b^2=4^2$

$9+b^2=16$

$b^2=7$

$b=2.64575$
1311

6.5



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

Triangle: $V=\frac{1}{2}\cdot b\cdot h$

$V=\frac{1}{2}\cdot 3\cdot 2.645751311$

$V=3.968626967 \times 2 = 7.937253933$

Rectangle $= V=Bh$

$V=60\cdot 6.5$

$V=390$

Volume of trailer $=$ $398ft^3$

Score 3: The student did not multiply by the height of the trailer to determine the volume of the triangular prism.

Question 34

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

$9 + x^2 = 16$

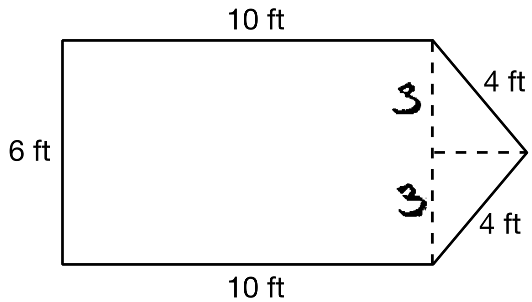
$-9 \quad -9$

$\sqrt{x^2} = \sqrt{7}$

$x \approx 2.6458$

Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$V_\Delta = \frac{1}{3}(6)(10)(2.6458)$

$V_\Delta = 52.916$

$V_\square = 6(10)(6.5)$

$V_\square = 390$

$$\begin{array}{r} 390 \\ +\ 52.916 \\ \hline 442.916 \end{array}$$

$\boxed{443}$

Score 2: The student found the height of the triangular base and the volume of the rectangular prism, but no further correct work was shown.

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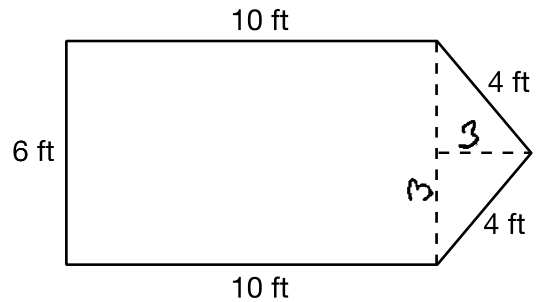
Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$10 \times 6 \times 6.5 = 390$

$3 \times 3 \times 6.5 = \frac{58.5}{2} = 29.25$

$390 + 29.25$

419.25

419

419 ft^3

Score 2: The student used an incorrect height of the base of the triangular prism. The student also incorrectly calculated by finding the volume of only half of the triangular prism.

Question 34

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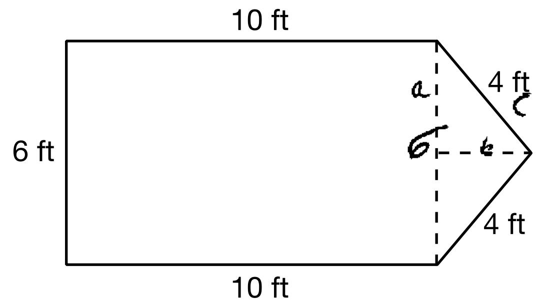
Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$V_{RP} = Bh$

$V_{RP} = (10)(10)(6)$

$V_{RP} = 600 \text{ ft}$

$V_{RP} = (10)(10)(6.5)$

$V_{RP} = 650$

$V_{TP} = \frac{1}{2}Bh$

$V_{TP} = \frac{1}{2}(6)(\sqrt{7})$

$V_{TP} = 7.937$

$650 + 7.937 =$

$\boxed{657.937 \text{ ft}^3}$

$3^2 + b^2 = 4^2$

$9 + b^2 = 16$

$-9 \quad -9$

$b^2 = 7$

$b = \sqrt{7}$

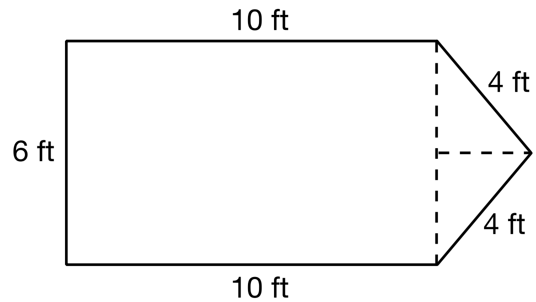
Score 1: The student found the height of the triangular base, but no further correct work was shown.

Question 34

34 A cargo trailer, pictured below, can be modeled by a rectangular prism and a triangular prism. Inside the trailer, the rectangular prism measures 6 feet wide and 10 feet long. The walls that form the triangular prism each measure 4 feet wide inside the trailer. The diagram below is of the floor, showing the inside measurements of the trailer.

Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$V = Bh$

$V = 6 \cdot 10 \cdot 6.5$

$V = 390$

$V = \frac{1}{2}Bh$

$V = 8 \cdot 6.5$

$V = 52$

Volume is 442 ft.

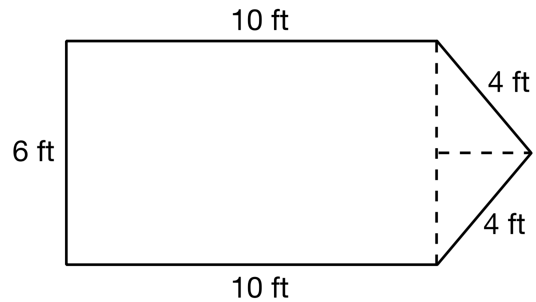
Score 1: The student found the volume of the rectangular prism, but no further correct work was shown.

Question 34

34 A cargo trailer, pictured below, can be modeled by a rectangular prism and a triangular prism. Inside the trailer, the rectangular prism measures 6 feet wide and 10 feet long. The walls that form the triangular prism each measure 4 feet wide inside the trailer. The diagram below is of the floor, showing the inside measurements of the trailer.

Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$V = bh$

$V = 10(6.5)$ $V = 4(6.5)$

$V = 65$ $V = 26$

$65 + 26 = 91$

The total volume is 91 ft^3.

Score 0: The student gave a completely incorrect response.

Question 34

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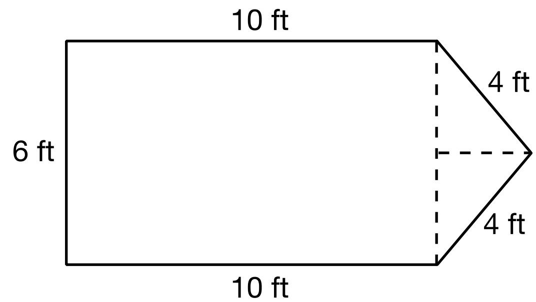
Cargo Trailer

Cargo Trailer Floor



If the inside height of the trailer is 6.5 feet, what is the total volume of the inside of the trailer, to the *nearest cubic foot*?

$B = 6 + 10 + 10 + 4 + 4$

$B = 34$

$V = Bh$

$V = 34(6.5)$

$V = 221$

The volume of the trailar is 221 ft^3

Score 0: The student gave a completely incorrect response.

35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

$$AB = \sqrt{(-5-1)^2 + (3-2)^2} = \sqrt{37}$$

$$BC = \sqrt{(-5--6)^2 + (3--3)^2} = \sqrt{37}$$

$\triangle ABC$ is isosceles b/c $AB = BC$

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

$(0,-4)$

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

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

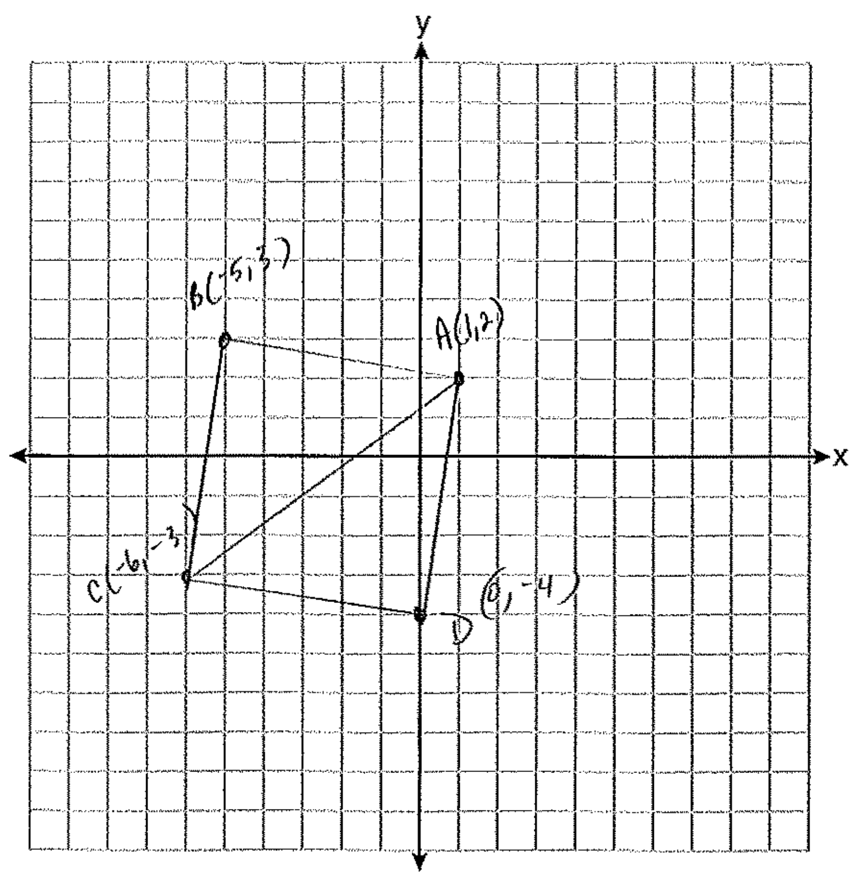
$AD = \sqrt{1^2 + (2 - -4)^2} = \sqrt{37}$

$CD = \sqrt{(-6 - 0)^2 + (-3 - -4)^2} = \sqrt{37}$

slope of $AB = \frac{3-2}{-5-1} = \frac{-1}{6}$

$CB = \frac{3 - -3}{-5 - -6} = 6$

ABCD is a square b/c all 4 sides are ≅ and consecutive sides are ⊥ since their slopes are opp. signed reciprocals, so ∠B is a right ∠.



35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

distance from A to B – $\sqrt{(-5-1)^2+(3-2)^2} = \sqrt{36+1} = \sqrt{37}$
distance from B to C – $\sqrt{(-6--5)^2+(-3-3)^2} = \sqrt{1+36} = \sqrt{37}$

Since there are two congruent sides, $\triangle ABC$ is isosceles.

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

D– (0, -4)

Score 5: The student did not write the concluding statement when proving the square.

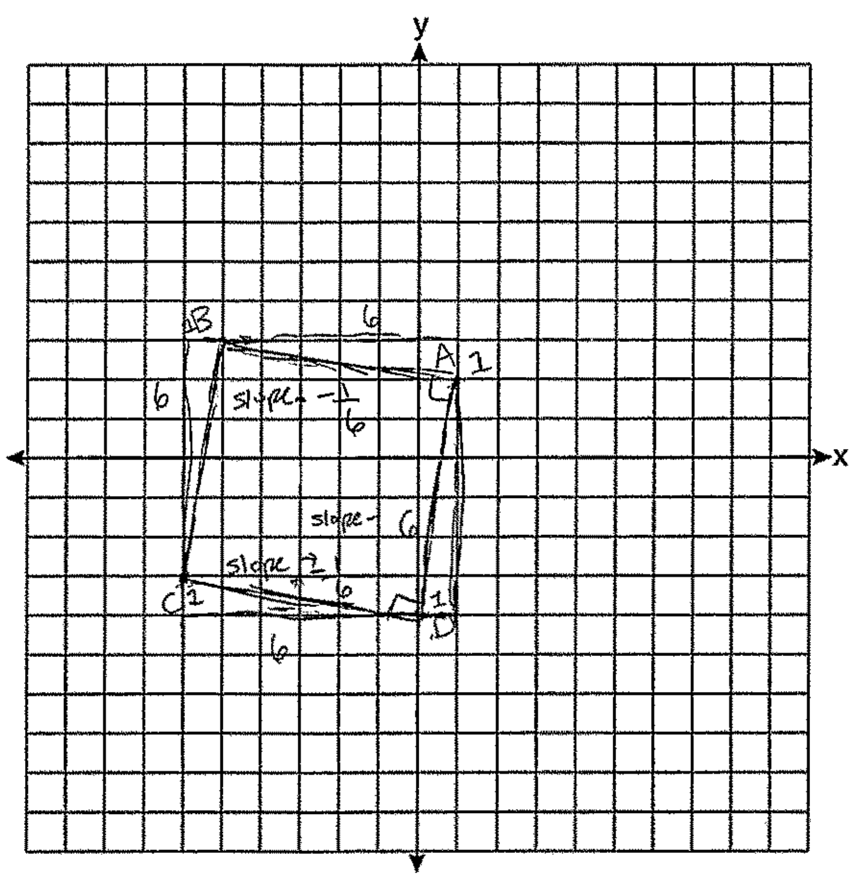
Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

$\overline{AB} = \sqrt{37}$
$\overline{BC} = \sqrt{37}$
$\overline{CD} = \sqrt{37}$
$\overline{DA} = \sqrt{37}$

$-\frac{1}{6}$, 6 slopes are negative reciprocals
$6, -\frac{1}{6}$

$\angle BAD = 90°$

$\angle ADC = 90°$
(slopes are negative reciprocals, making them perpendicular)



Question 35

35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

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

$d = \sqrt{36 + 1}$

$d = \sqrt{37}$

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

$d = \sqrt{1 + 36}$

$d = \sqrt{37}$

$\overline{AB}$ and $\overline{BC}$ are congruent so $\triangle ABC$ is isosceles.

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

$D(0,-4)$

Score 4: The student made a conceptual error by stating that all sides with the same length is a square.

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

$AB \sim d = \sqrt{37}$

$BC \sim d = \sqrt{37}$

$CD \sim d = \sqrt{(-6-0)^2 + (-3+-4)^2}$

$d = \sqrt{36+1}$

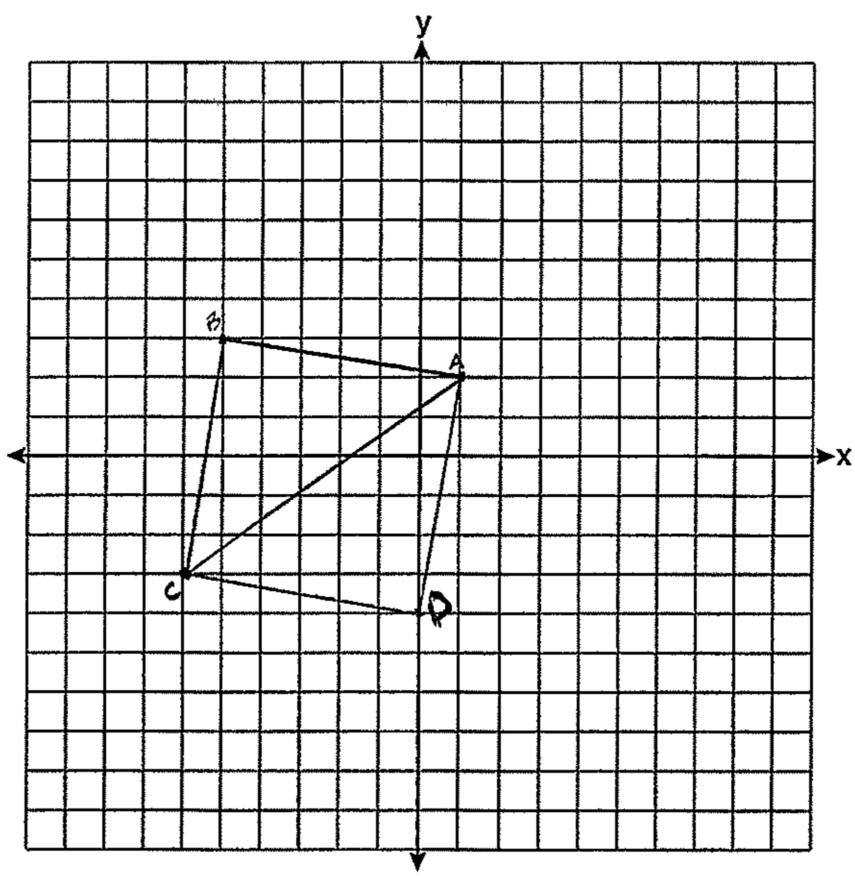
$d = \sqrt{37}$

$DA \sim d = \sqrt{(0-1)^2 + (-4-2)^2}$

$d = \sqrt{1+36}$

$d = \sqrt{37}$

All sides have the same length therefore it is a square.



Question 35

35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

$AB = \sqrt{(1-(-5))^2+(2-3)^2} = \sqrt{(6)^2+(-1)^2} = \sqrt{36+1} = \sqrt{37}$

$BC = \sqrt{(-5-(-6))^2+(3-(-3))^2} = \sqrt{(1)^2+(6)^2} = \sqrt{1+36} = \sqrt{37}$

$CA = \sqrt{(-6-1)^2+(-3-(2))^2} = \sqrt{(-7)^2+(-5)^2} = \sqrt{49+25} = \sqrt{74}$

$\therefore$ $\triangle ABC$ is isosceles b/c two sides are congruent

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

$(-1,-4)$

Score 3: The student proved $\triangle ABC$ is isosceles. The student graphed points C and D incorrectly, which resulted in a quadrilateral that is not a square. The student made an appropriate concluding statement based on their work, but the level of difficulty was significantly reduced.

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

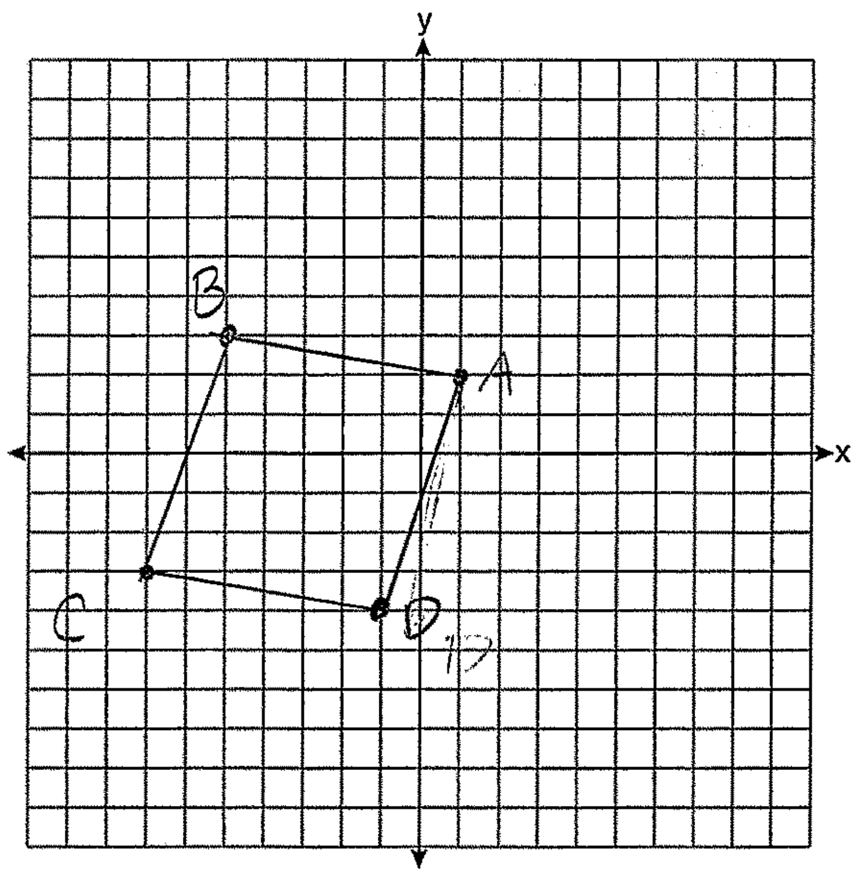
$\overline{AB} =$

$BC =$

$CD = \sqrt{(-6-(-1))^2+(-3-(-4))^2} = \sqrt{(-5)^2+(1)^2} = \sqrt{25+1} = \sqrt{26}$

$DA = \sqrt{(-1-1)^2+(-4-2)^2} = \sqrt{(-2)^2+(-6)^2} = \sqrt{4+36} = \sqrt{40}$

∴ ABCD is not a square
b/c all sides are not congruent



Question 35

35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

$d = \sqrt{\Delta x^2 + \Delta y^2}$

$\overline{AB}$ $d = \sqrt{(1+5)^2 + (2-3)^2} = \sqrt{36+2} = \sqrt{38}$

$\overline{BC}$ $d = \sqrt{(-5+6)^2 + (3+3)^2} = \sqrt{2+36} = \sqrt{38}$ $\Big\} \cong$

$\overline{CA}$ $d = \sqrt{(-6-1)^2 + (-3-2)^2} = \sqrt{49+25} = \sqrt{74}$

$\triangle ABC$ is isocelese because it has 2 $\cong$ sides and 1 non-$\cong$ side

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

Score 3: The student proved $\triangle ABC$ is isosceles, but one computational error was made. The coordinates of point D were not stated. In proving $ABCD$ is a square, the student was missing the length of $\overline{AD}$.

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

$\overline{CD}$ ~~$d = \sqrt{(-6+1)^2+(-3+4)^2} = \sqrt{25+2} = \sqrt{27}$~~

$d = \sqrt{(-6-0)^2+(-3+4)^2} = \sqrt{36+2} = \sqrt{38}$ ✓

$\sqrt{38} = \sqrt{38} = \sqrt{38}$

$\overline{CD} \cong \overline{CD} \cong \overline{BA} \cong \overline{AD}$

all sides are equal
and have rt ∡'s

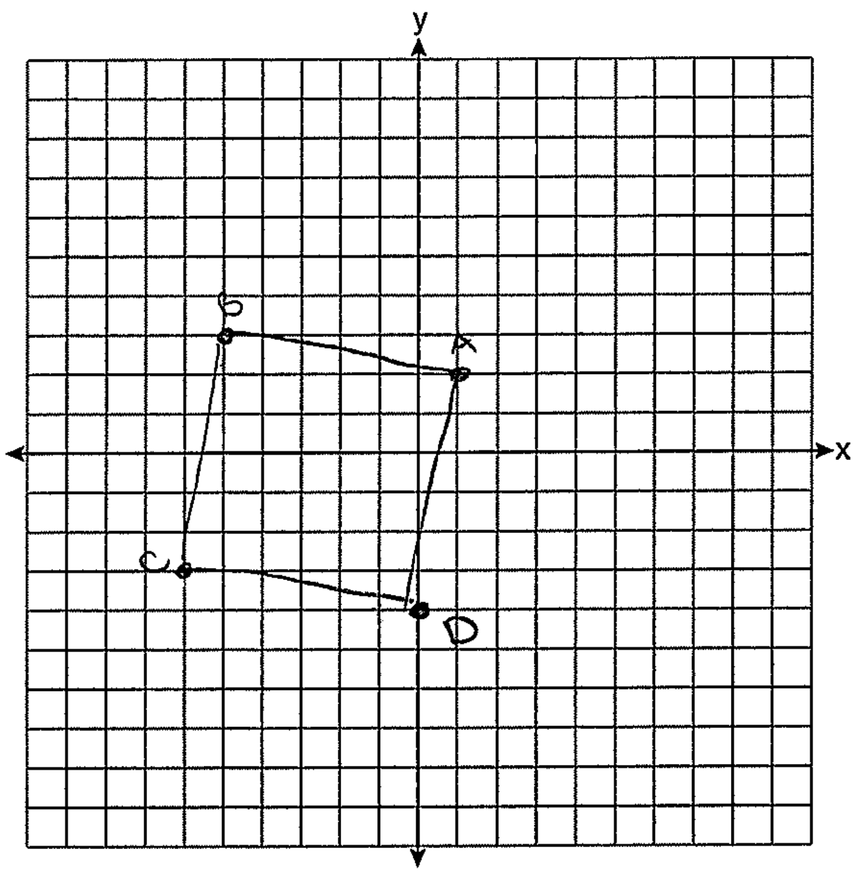
$\overline{CD}$

$\frac{\Delta y}{\Delta x}$ $\frac{-3+4}{-6-0} = \frac{1}{-6}$

$\overline{AD}$ $\frac{2+4}{1-0} = \frac{6}{1}$

⊥ slopes

⊥ lines form rt ∡'s



Question 35

35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

$$d_{AB} = \sqrt{(-5-1)^2+(3-2)^2} = \sqrt{(-6)^2+(1)^2} = \sqrt{36+1} = \sqrt{37}$$

$$d_{BC} = \sqrt{(-6+5)^2+(-3-3)^2} = \sqrt{(-1)^2+(-6)^2} = \sqrt{1+36} = \sqrt{37}$$

$\overline{AB} \cong \overline{BC}$ therefor $\triangle ABC$ is isosc.

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

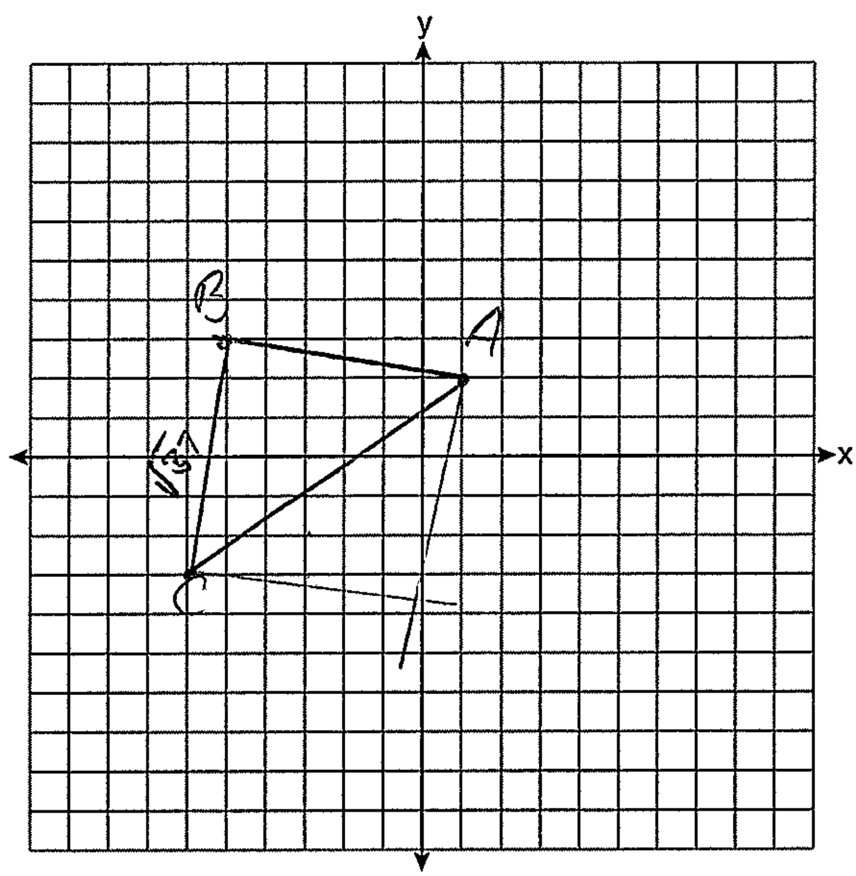
?

Score 2: The student proved $\triangle ABC$ is isosceles, but no further correct work was shown.

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

?

$$\sqrt{37} = \sqrt{(x-1)^2 + (y-2)^2}$$



Question 35

35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

$A(1,2)$ $B(-5,3)$ $\frac{2-3}{1--5}$ $\frac{-1}{6}$ $-1^2+6^2=\sqrt{37}$

$B(-5,3)$ $C(-6,-3)$ $\frac{3--3}{-5--6}$ $\frac{6}{1}$ $6^2+1^2=\sqrt{37}$

$C(-6,-3)$ $A(1,2)$ $\frac{-3-2}{-6-1}$ $\frac{-5}{-7}$ $-5^2+-7^2=\sqrt{74}$

$\therefore \triangle ABC$ is isosceles because 2 sides are equal, they have similar slopes

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

$D(0,-4)$

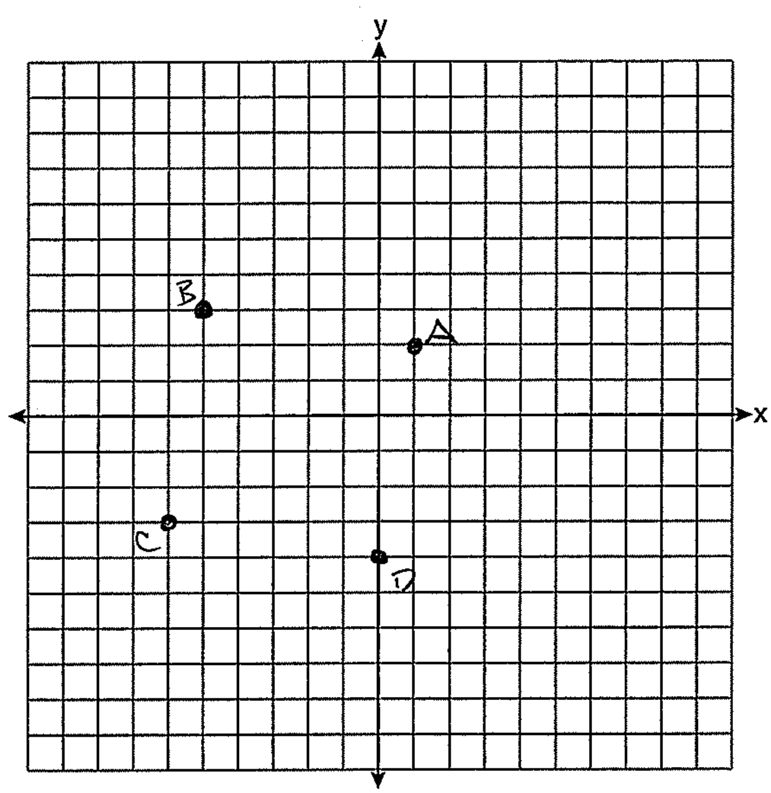
Score 2: The student showed the appropriate work to prove $\triangle ABC$ is isosceles, but the concluding statement included an incorrect phrase. The student stated the coordinates of point D. The student did not show enough additional correct work to earn more credit.

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

C(-6,-3) $\frac{-3+4}{-6-0}$ $\frac{1}{-6}$
D(0,4)

CD(-D(0 4) $\frac{4-2}{0-1}$ $\frac{2}{-1}$
DA A(1,2)

∴ Quad ABCD is a square because all the slopes are equal.



Question 35

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Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

Triangle ABC is isosceles because the length of $\overline{BA}$ is equal to the length of $\overline{BC}$

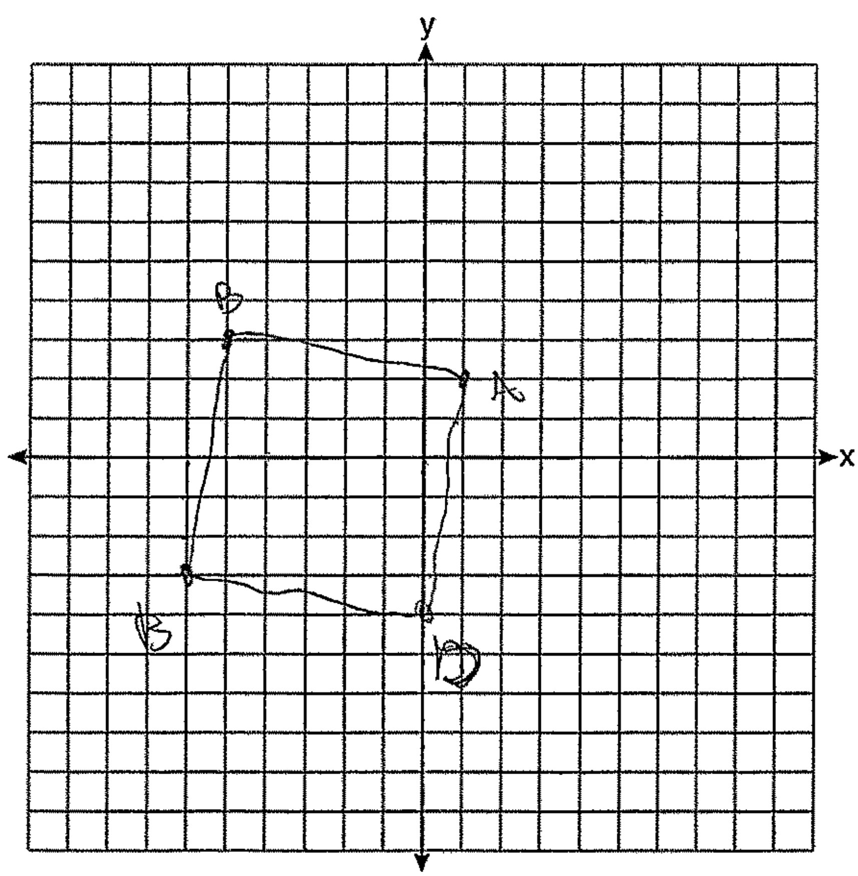
State the coordinates of point D such that quadrilateral $ABCD$ is a square.

$(0,-4)$

Score 1: The student stated the coordinates of point D, but no further correct work was shown.

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

quadrilateral ABCD is a square because the distance from $\overline{AB}$, $\overline{BC}$ $\overline{CD}$ $\overline{DA}$ are the same and all angle meet to form 90° angles



Question 35

35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

isosceles triangles have to have a 90° angle which is what <B is

Slope of $\overline{AB} = \frac{6}{1}$ $-\frac{1}{6}$

Slope of $\overline{BC} = \frac{6}{1}$ $\frac{-1}{6}$

Negative recipricals same slope

Slope is $\frac{3}{4}$

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

point D = (0, -4)

Score 1: The student stated the coordinates of point D, but did not show enough correct work to earn additional credit.

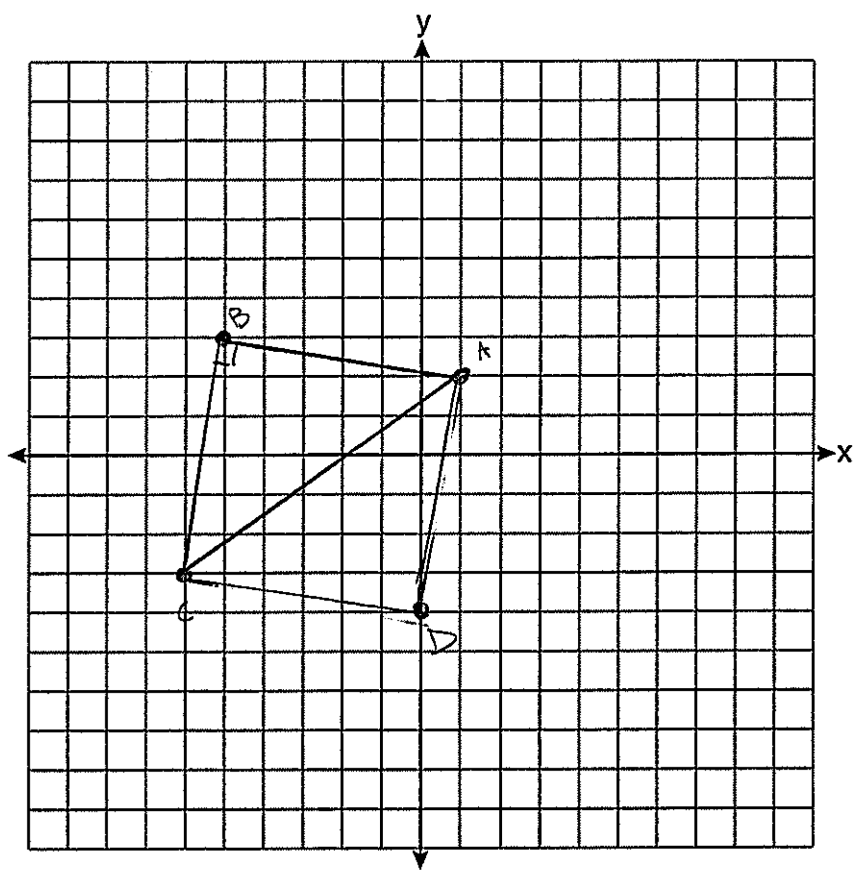
Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]

4 90° angles

same slope

$\frac{6}{1}$ + $\frac{-1}{6}$

negative recipricals



35 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$.

Prove that $\triangle ABC$ is isosceles.
[The use of the set of axes on the next page is optional.]

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

$A(1,2)$ $\quad B(-5,3)$ $\quad c(-6,-3)$

$x_1 \quad y_1 \qquad x_2 \quad y_2$

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

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

$D(-2, -)$

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

Prove that your quadrilateral *ABCD* is a square.
[The use of the set of axes below is optional.]