The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY (COMMON CORE)

Thursday, January 26, 2017 — 9:15 a.m. to 12:15 p.m.

MODEL RESPONSE SET

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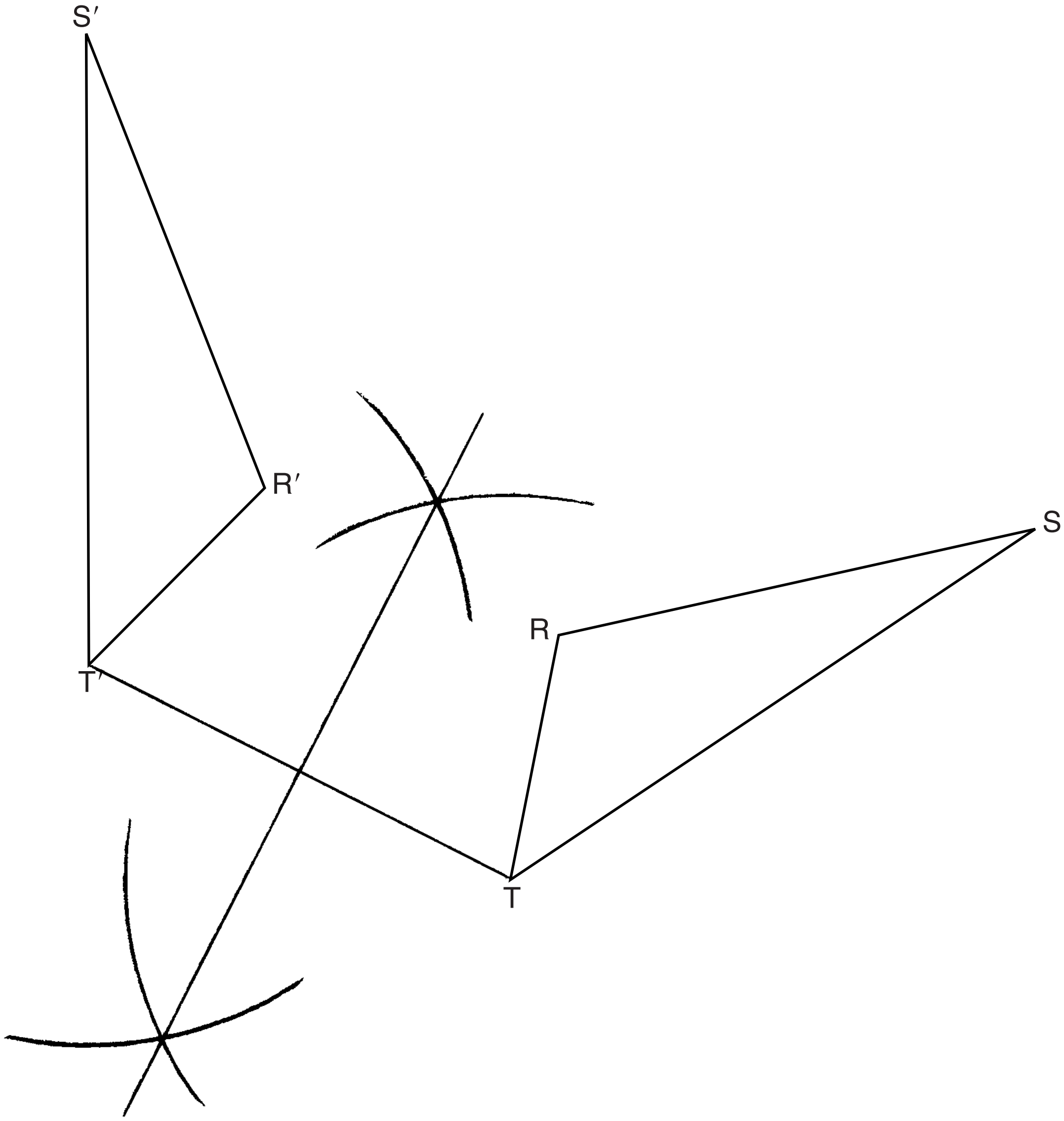
Question 25

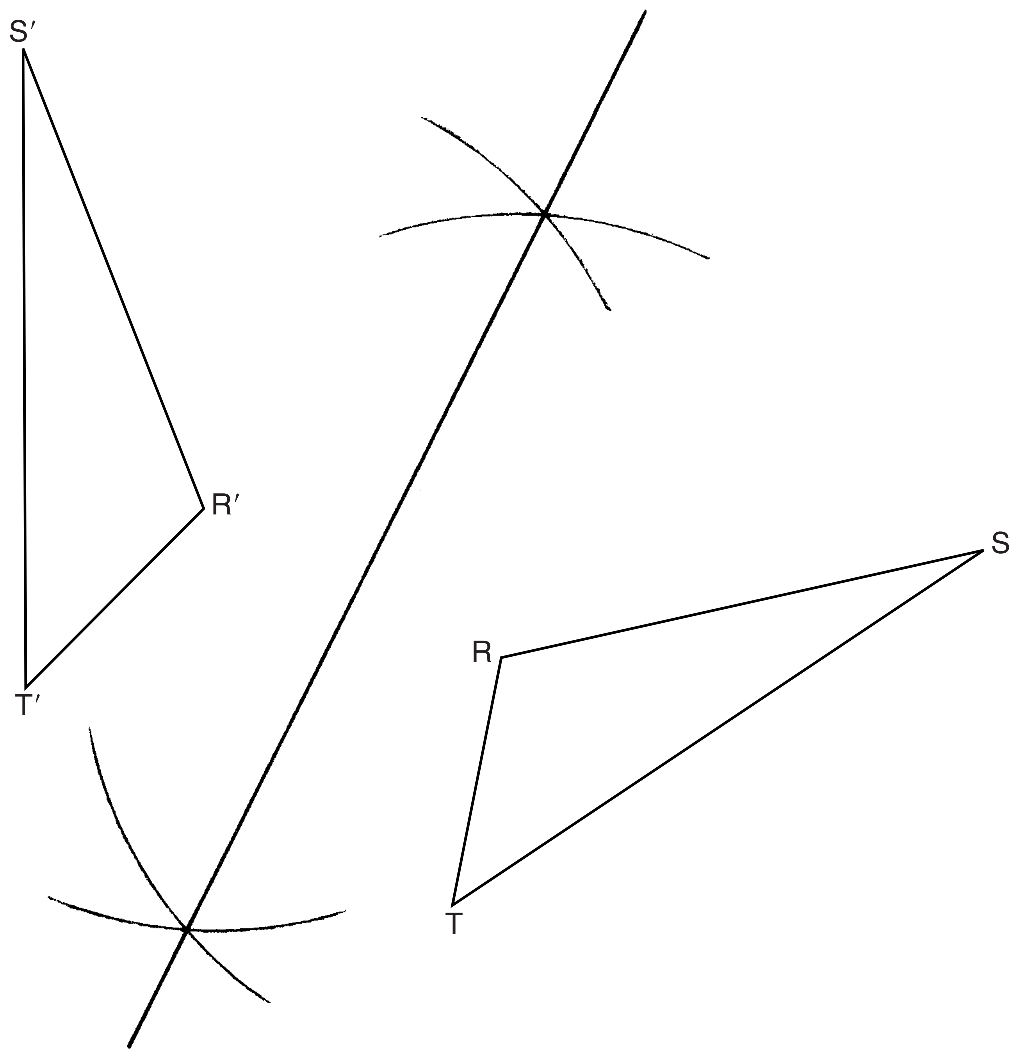
25 Using a compass and straightedge, construct the line of reflection over which triangle RST reflects onto triangle $R'S'T'$. [Leave all construction marks.]



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

Question 25

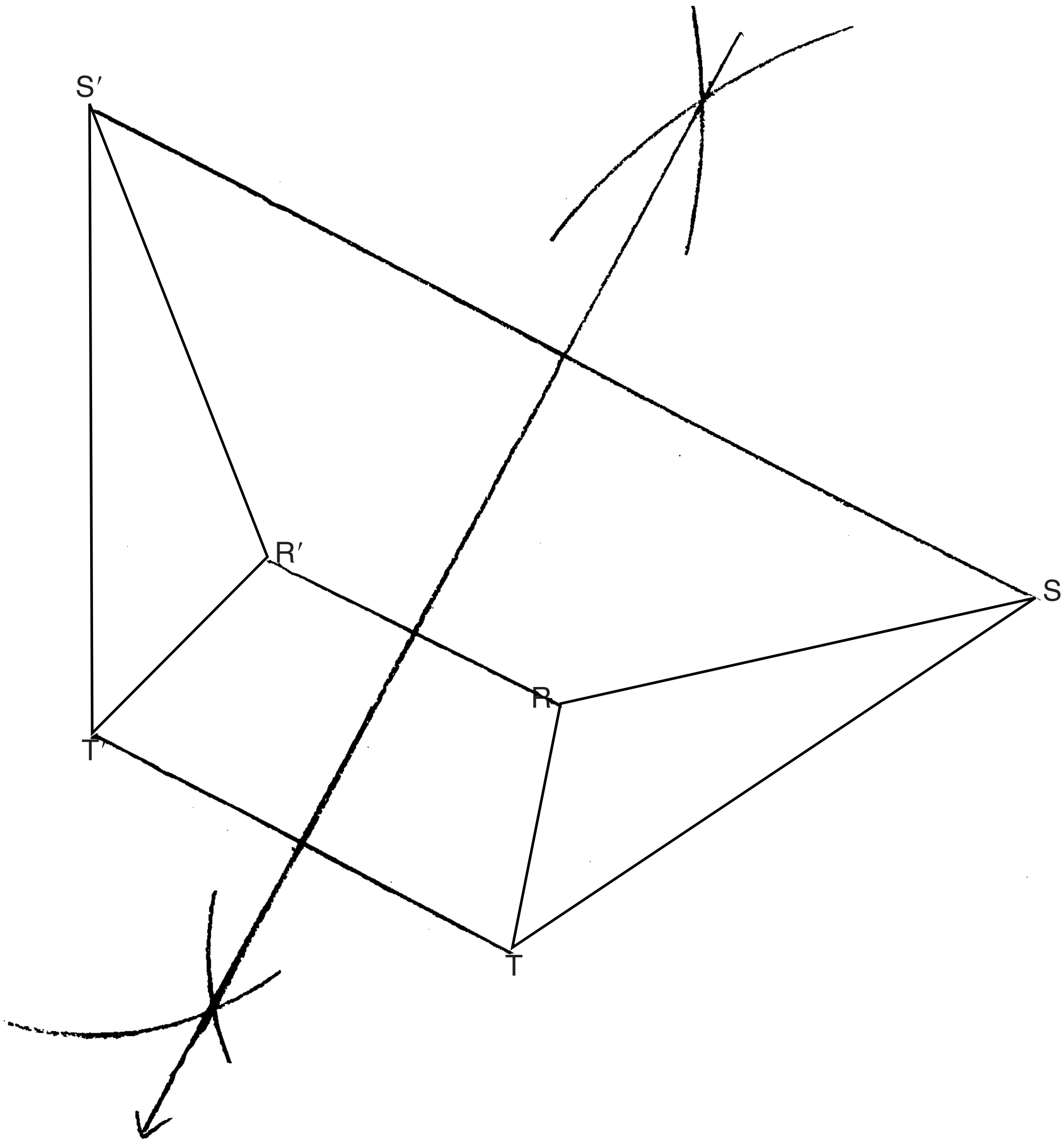
25 Using a compass and straightedge, construct the line of reflection over which triangle RST reflects onto triangle $R'S'T'$. [Leave all construction marks.]



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

Question 25

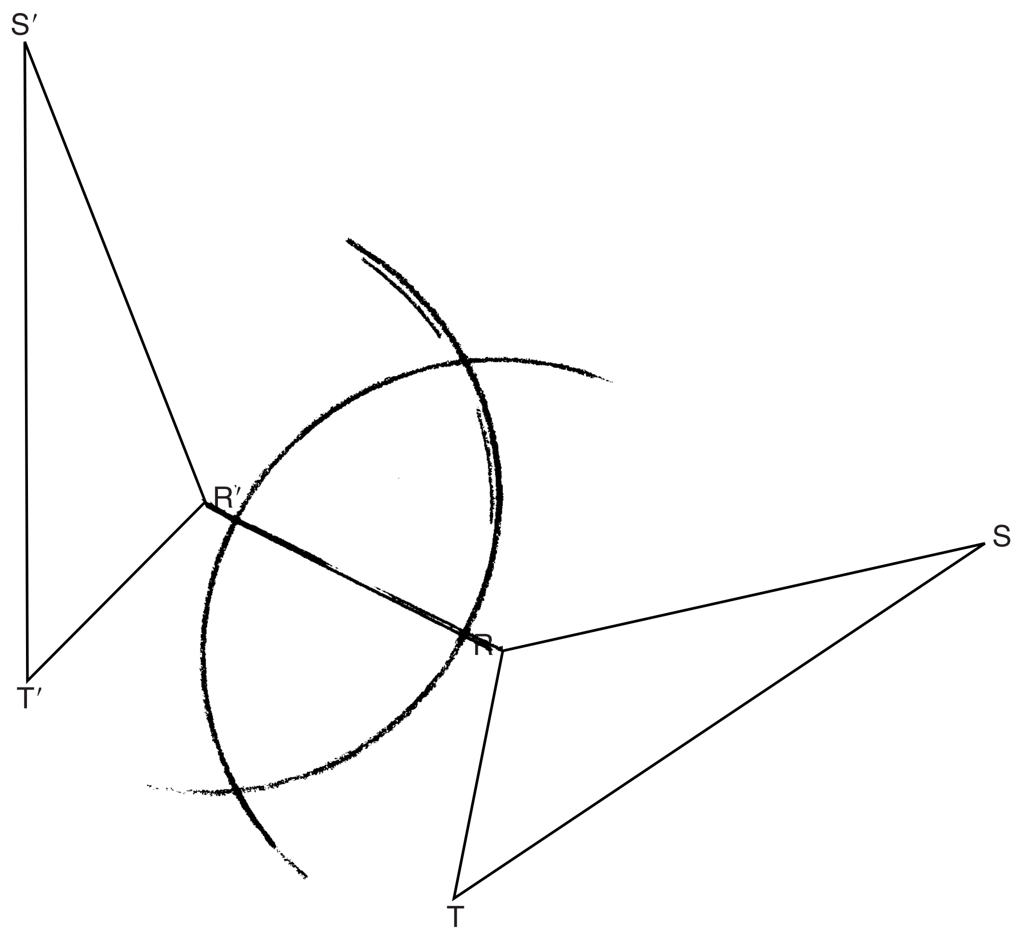
25 Using a compass and straightedge, construct the line of reflection over which triangle RST reflects onto triangle $R'S'T'$. [Leave all construction marks.]



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

Question 25

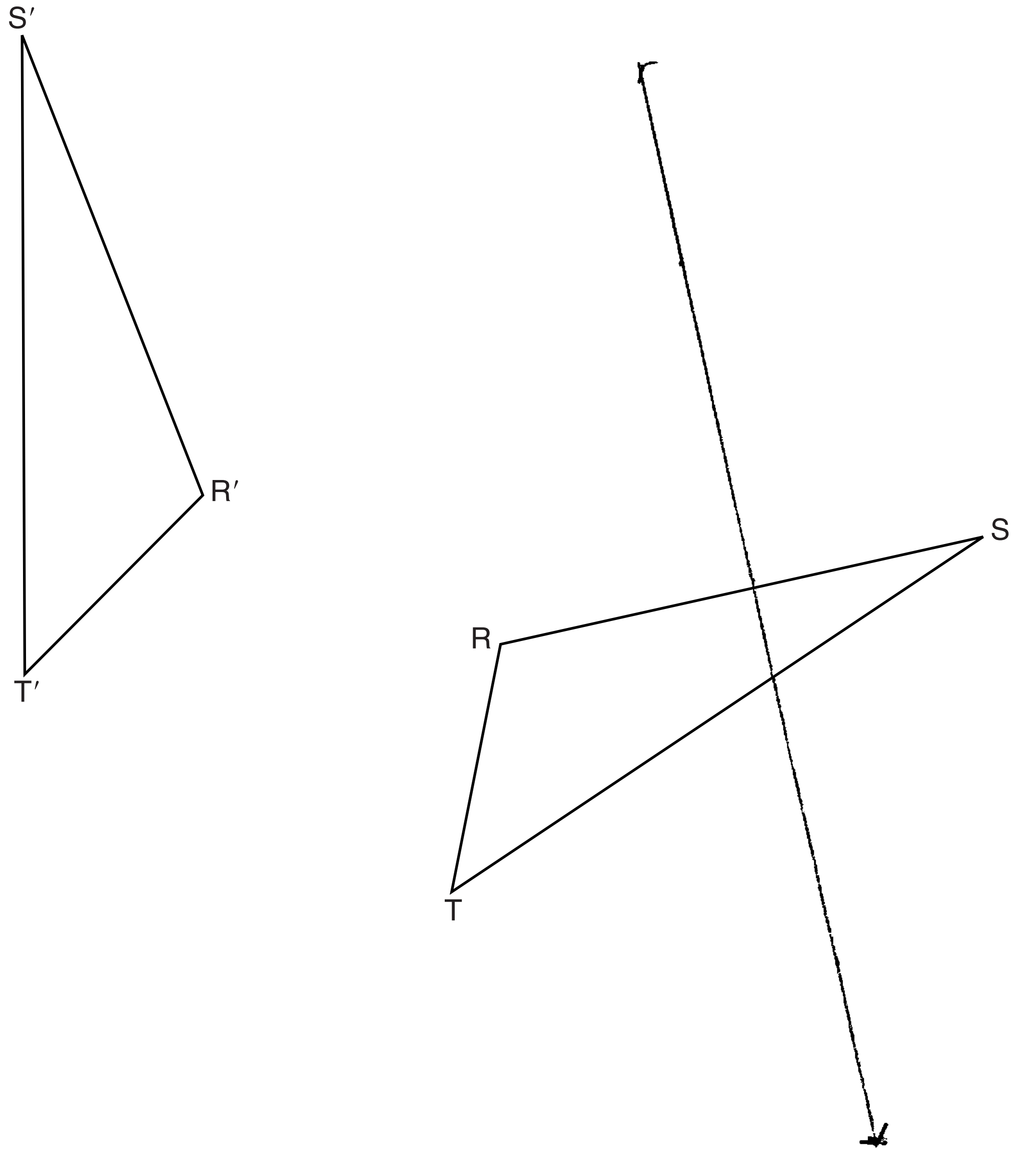
25 Using a compass and straightedge, construct the line of reflection over which triangle RST reflects onto triangle $R'S'T'$. [Leave all construction marks.]



Score 1: The student had a correct construction, but did not draw the line of reflection.

Question 25

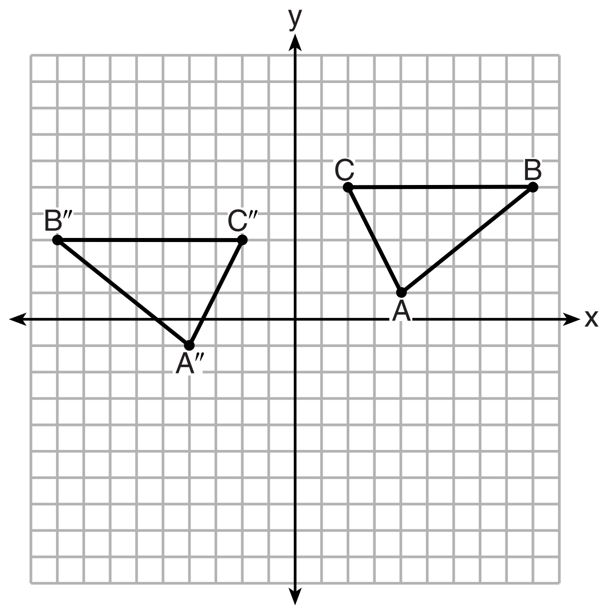
25 Using a compass and straightedge, construct the line of reflection over which triangle RST reflects onto triangle $R'S'T'$. [Leave all construction marks.]



Score 0: The student had a completely incorrect response.

Question 26

26 The graph below shows $\triangle ABC$ and its image, $\triangle A''B''C''$.



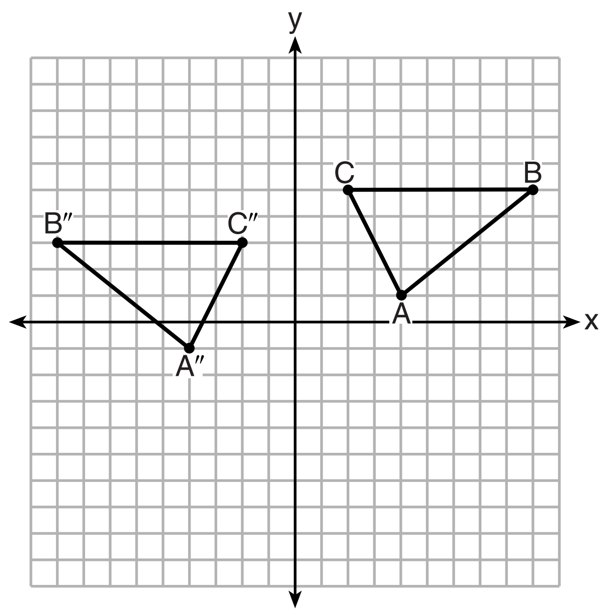
Describe a sequence of rigid motions which would map $\triangle ABC$ onto $\triangle A''B''C''$.

Translate $\triangle ABC$ left 4 units and down 2 units followed by a reflection over line $x = -2$

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

Question 26

26 The graph below shows $\triangle ABC$ and its image, $\triangle A''B''C''$.



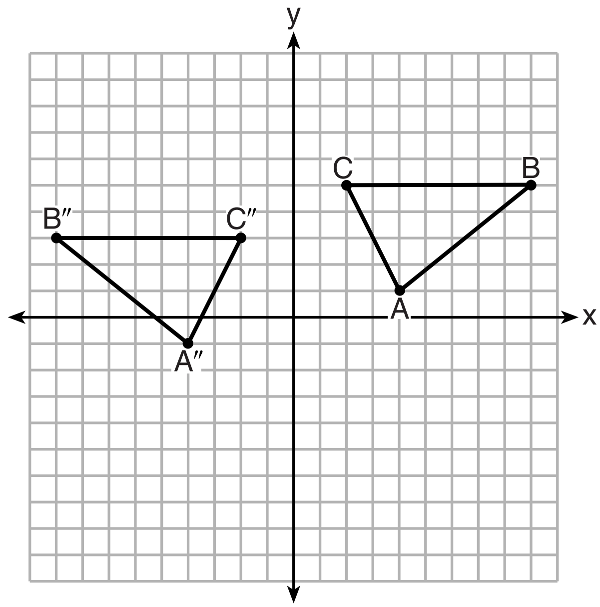
Describe a sequence of rigid motions which would map $\triangle ABC$ onto $\triangle A''B''C''$.

$r_{y\text{-axis}}$ followed by $T_{(0,-2)}$

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

Question 26

26 The graph below shows $\triangle ABC$ and its image, $\triangle A''B''C''$.



Describe a sequence of rigid motions which would map $\triangle ABC$ onto $\triangle A''B''C''$.

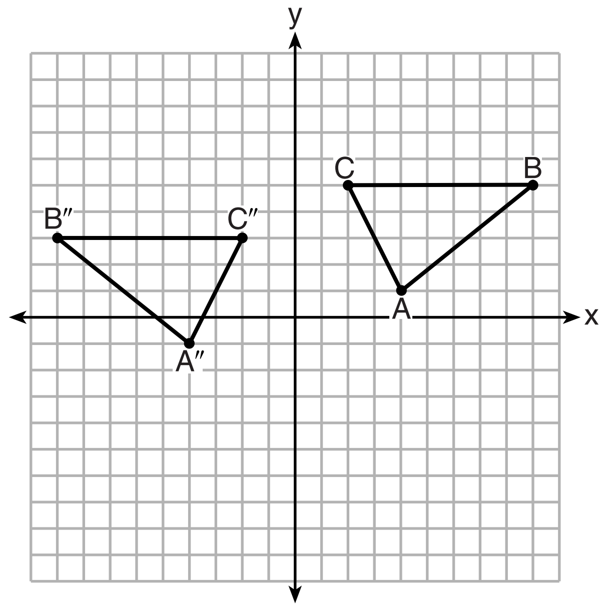
1.) $r_{y\text{-axis}}$ (reflection)

2.) $T_{0,2}$ (Translation)

Score 1: The student wrote an incorrect translation by translating in the wrong direction.

Question 26

26 The graph below shows $\triangle ABC$ and its image, $\triangle A''B''C''$.



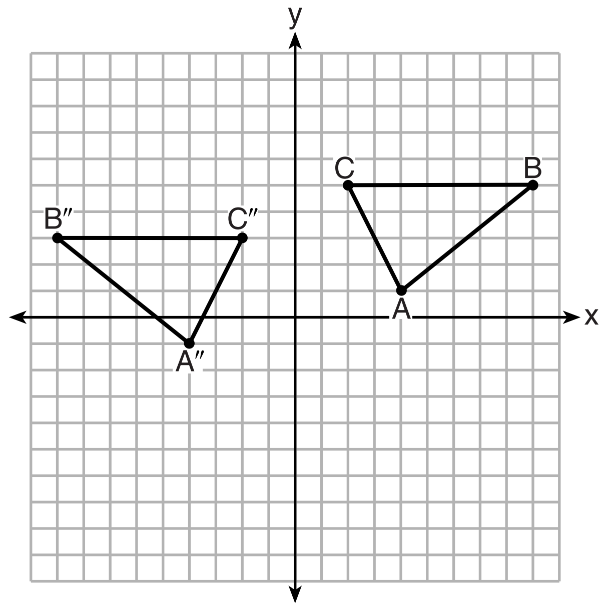
Describe a sequence of rigid motions which would map $\triangle ABC$ onto $\triangle A''B''C''$.

a reflection over the y-axis,
followed by a translation 2 units up

Score 1: The student completed a correct sequence of rigid motions, but went from the image to the pre-image.

Question 26

26 The graph below shows $\triangle ABC$ and its image, $\triangle A''B''C''$.



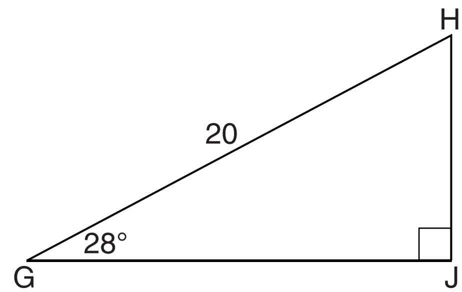
Describe a sequence of rigid motions which would map $\triangle ABC$ onto $\triangle A''B''C''$.

a translation over 4 down 2
across the y-axis.

Score 0: The student's description did not have enough detail to receive any credit.

Question 27

27 When instructed to find the length of $\overline{HJ}$ in right triangle HJG, Alex wrote the equation $\sin 28° = \frac{HJ}{20}$ while Marlene wrote $\cos 62° = \frac{HJ}{20}$. Are both students' equations correct? Explain why.



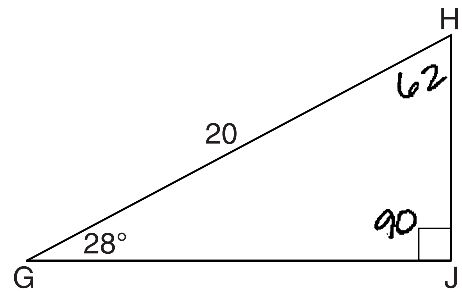
Yes, b/c 28° and 62° are acute angles and complementary angles. Since the sin of an angle equals the cos of its complement, both equations are correct.

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

Question 27

27 When instructed to find the length of $\overline{HJ}$ in right triangle HJG, Alex wrote the equation $\sin 28° = \frac{HJ}{20}$ while Marlene wrote $\cos 62° = \frac{HJ}{20}$. Are both students' equations correct? Explain why.

SOHCAHTOA



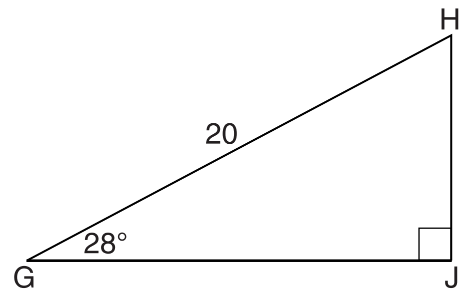
$$\begin{array}{r} 90 \\ -28 \\ \hline 62 \end{array}$$

Yes, both students are right because sine= $\frac{\text{opposite}}{\text{hypothenuse}}$ and Cosine = $\frac{\text{adjacent}}{\text{hypothenuse}}$, so both of the equations written are correct. Both Marlene and Alex could find HJ because HJ is opposite from 28°, but also adjacent to 62° So both are correct ways to get the answer.

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

Question 27

27 When instructed to find the length of $\overline{HJ}$ in right triangle HJG, Alex wrote the equation $\sin 28° = \frac{HJ}{20}$ while Marlene wrote $\cos 62° = \frac{HJ}{20}$. Are both students' equations correct? Explain why.



yes both students are correct because cos 62 and sin 28 are equal to each other.

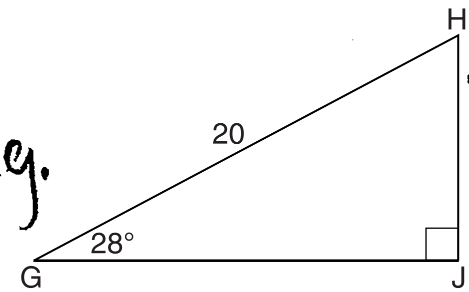
Score 1: The student wrote an incomplete explanation by not explaining why cos 62° and sin 28° are equal.

Question 27

27 When instructed to find the length of $\overline{HJ}$ in right triangle HJG, Alex wrote the equation $\sin 28° = \frac{HJ}{20}$ while Marlene wrote $\cos 62° = \frac{HJ}{20}$. Are both students' equations correct? Explain why.

$\sin 28 = \frac{HJ}{20}$ $\cos = \frac{GJ}{20}$

Alex is right
Marlene is wrong.



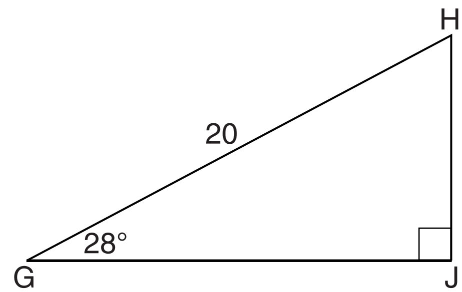
sin cos Tan
SOH CAH TOA
O/H A/H O/A

Since you have to find the length of $\overline{HJ}$ you would use sin because it is opposite of the angle 28 and there is a hypotenuse in this triangle, so Alex is right. Marlene would be right if you needed to find the length of GJ.

Score 1: The student made an error by not considering complementary angles.

Question 27

27 When instructed to find the length of $\overline{HJ}$ in right triangle HJG, Alex wrote the equation $\sin 28° = \frac{HJ}{20}$ while Marlene wrote $\cos 62° = \frac{HJ}{20}$. Are both students' equations correct? Explain why.

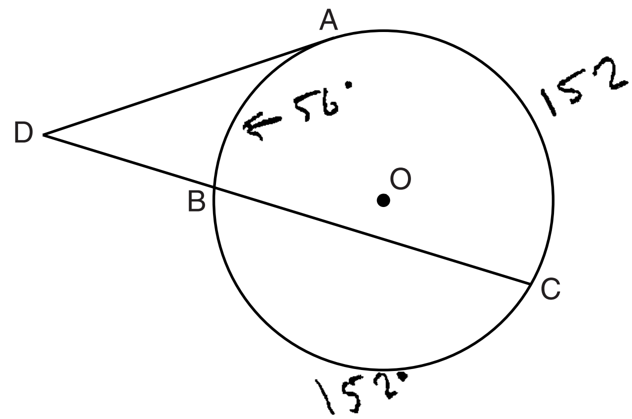


No, Marlene is right since the side opposite the 62° is not in the equation.

Score 0: The student had a completely incorrect response.

Question 28

28 In the diagram below, tangent $\overline{DA}$ and secant $\overline{DBC}$ are drawn to circle O from external point D, such that $\overset{\frown}{AC} \cong \overset{\frown}{BC}$.



If $m\overset{\frown}{BC} = 152°$, determine and state $m\angle D$.

$360 - 152 - 152 = 56$

$152 - 56 = 96$

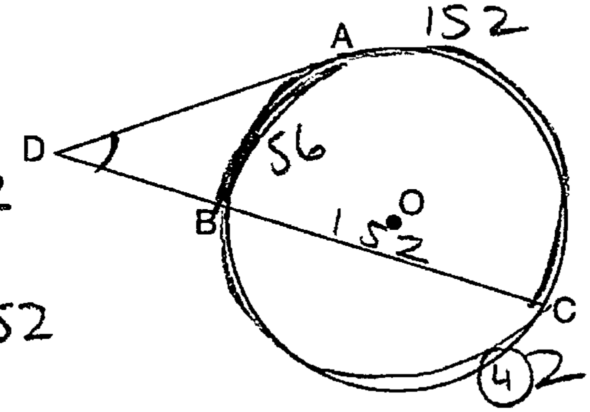
$96/2 = 48$

$\boxed{m\angle D = 48°}$

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

28 In the diagram below, tangent $\overline{DA}$ and secant $\overline{DBC}$ are drawn to circle O from external point D, such that $\widehat{AC} \cong \widehat{BC}$.

① $\widehat{BC} = 152$
$\widehat{BC} \cong \widehat{AC}$
$\widehat{AC} = 152$



② $152 + 152 = 304$

③ $360 - 304 = 56$

$\frac{156}{4} = 28$, 4, 16

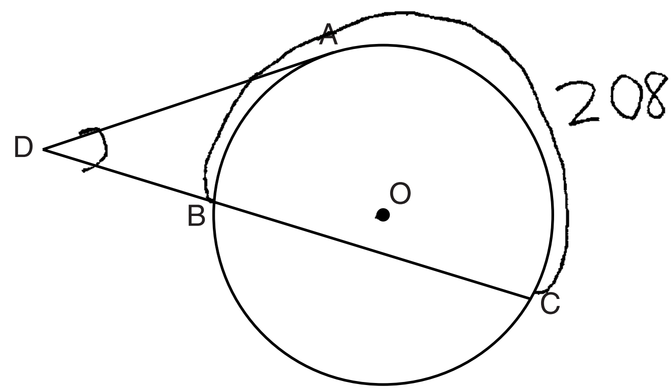
If m$\widehat{BC}$ = 152°, determine and state m∠D.

28°

Score 1: The student showed appropriate work to find m$\widehat{AC}$ and m$\widehat{AB}$, but no further correct work was shown.

Question 28

28 In the diagram below, tangent $\overline{DA}$ and secant $\overline{DBC}$ are drawn to circle O from external point D, such that $\overarc{AC} \cong \overarc{BC}$.



If $m\overarc{BC} = 152°$, determine and state $m\angle D$. 152

$$\begin{array}{r} 360 \\ -152 \\ \hline 208 \end{array}$$

$\angle D = \frac{1}{2} \overarc{BAC}$

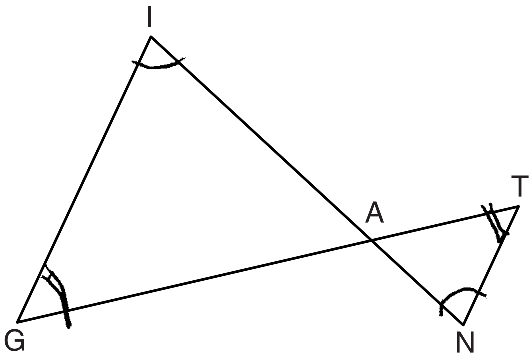
$= \frac{1}{2}(208)$

$\angle D = 104$

Score 0: The student had a completely incorrect response.

Question 29

29 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.



Prove: $\triangle GIA \sim \triangle TNA$

$\overline{GI} \parallel \overline{NT}$, $\overline{IN}$ intersects $\overline{GT}$ at A
(Given)

↓

$\angle I \cong \angle N$, $\angle G \cong \angle T$
(|| lines cut by a transversal makes ≅ alt. int. ∠s)

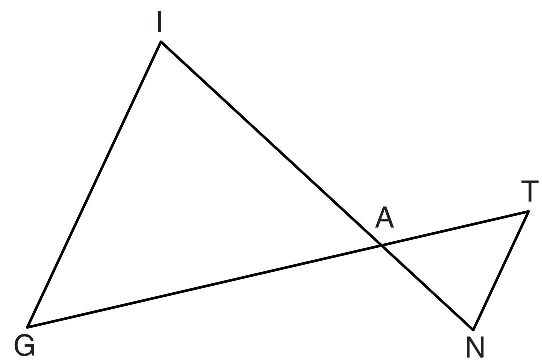
↓

$\triangle GIA \sim \triangle TNA$
(AA)

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

Question 29

29 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.

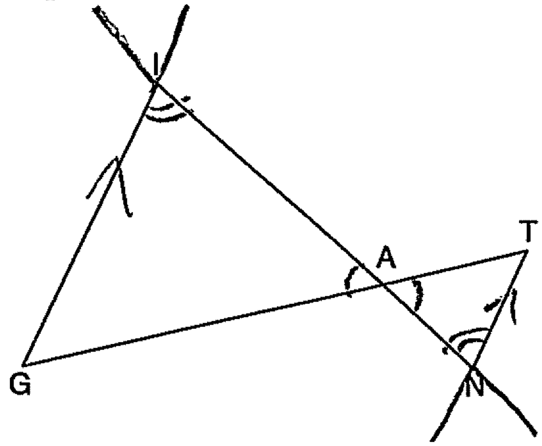


Prove: $\triangle GIA \sim \triangle TNA$

Rotate ΔTNA 180° about point A.
This rotation will put T' on $\overline{GA}$ and
N' on $\overline{IA}$ and keep $\overline{GI} \parallel \overline{N'T'}$. Now
dilate $\Delta T'N'A$ by a scale factor of
$\frac{GA}{T'A}$ and centered at A, which maps $\Delta T'N'A$
onto ΔGIA.
This similarity transformation
proves $\Delta GIA \sim \Delta TNA$

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

29 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.



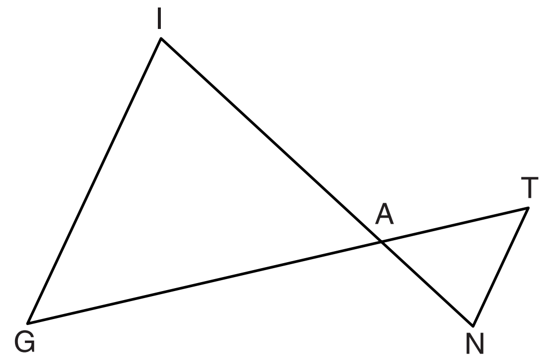
Prove: $\triangle GIA \sim \triangle TNA$

statements	Reasons
$\overline{GI}$ parallel to $\overline{NT}$ $\overline{IN}$ intersects $\overline{GT}$ at A	Given
$\angle IAG \cong \angle NAT$	- Vertical Angles are $\cong$
$\angle GIA \cong \angle TNA$	- Two parallel lines cut by a transversal creates congruent alternate interior angles
$\triangle GIA \sim \triangle TNA$	- AA similarity Criterion

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

Question 29

29 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.



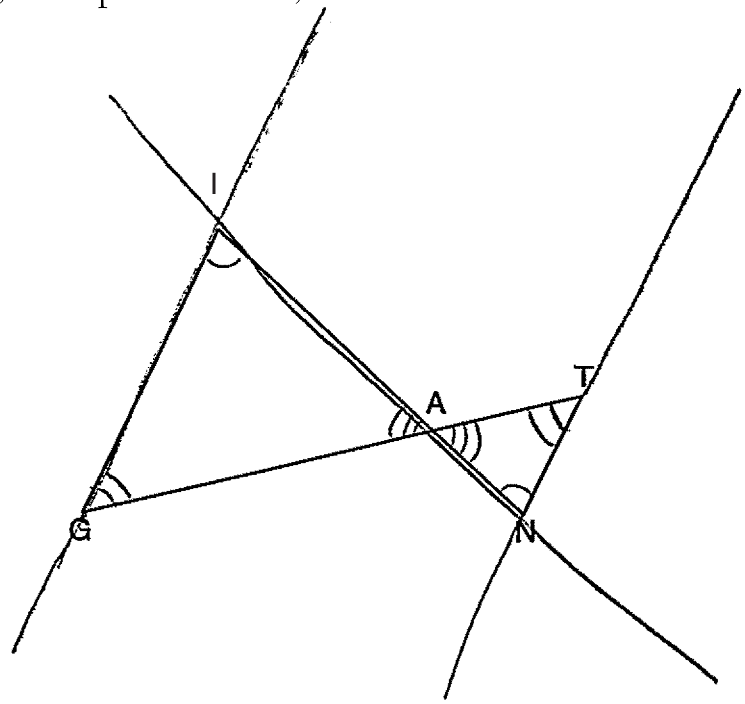
Prove: $\triangle GIA \sim \triangle TNA$

Statement	Reason
1. $\overline{IN}$ intersects $\overline{GT}$ at A	1. given
2. $\angle IAG \cong \angle NAT$	2. Vertical $\angle$'s are $\cong$
3. $\overline{GT}$ is parallel to $\overline{NT}$	3. given
4. $\angle G \cong \angle T$	4. Alternate interior $\angle$'s are $\cong$
5. $\triangle GIA \sim \triangle TNA$	5. AA Thm.

Score 1: The student wrote an incomplete reason for statement 4.

Question 29

29 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.



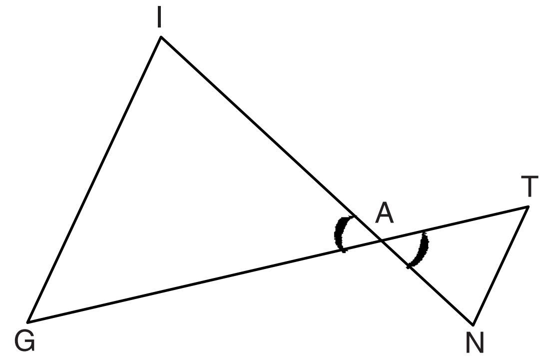
Prove: $\triangle GIA \sim \triangle TNA$

Statement	Reason
1. Givens	1. Givens
2. $\angle G \cong \angle T$ $\angle I \cong \angle N$	2. alternate interior angles.
3. $\angle TAN \cong \angle GAI$	3. vertical angles are $\cong$
4. $\triangle GIA \cong \triangle TNA$	4. AA

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

Question 29

29 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.

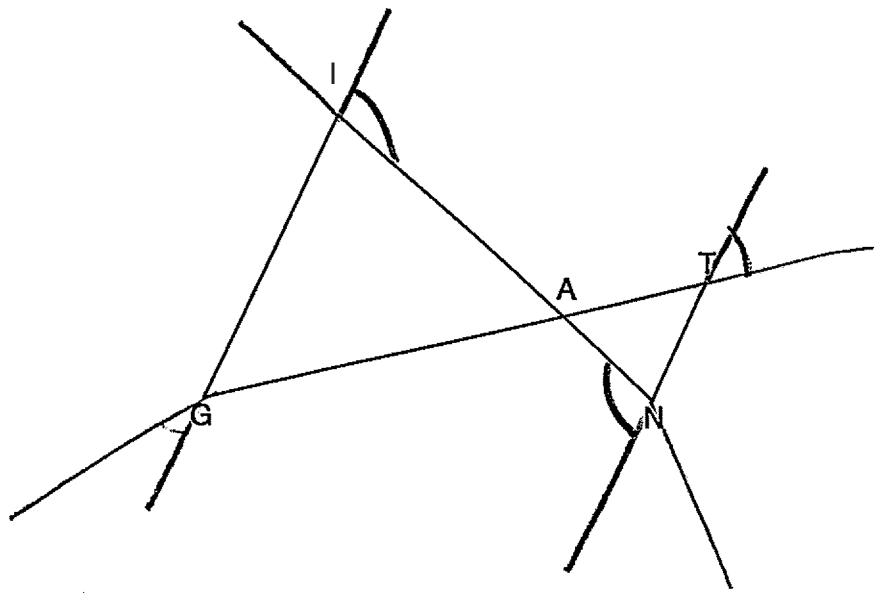


Prove: $\triangle GIA \sim \triangle TNA$

1) $\overline{GI} \parallel \overline{NT}$ — 1) Given
2) $\overline{IN}$ intersects $\overline{GT}$ at A — 2) Given
3) $\angle IAG \cong \angle TAN$ — 3) vertical $\angle$'s

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

29 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.



Prove: $\triangle GIA \sim \triangle TNA$

$\overline{GI}$ is parallel to $\overline{NT}$ given

$\measuredangle N \cong \measuredangle I$ alternate interior

$\measuredangle G \cong \measuredangle T$ alt. ext.

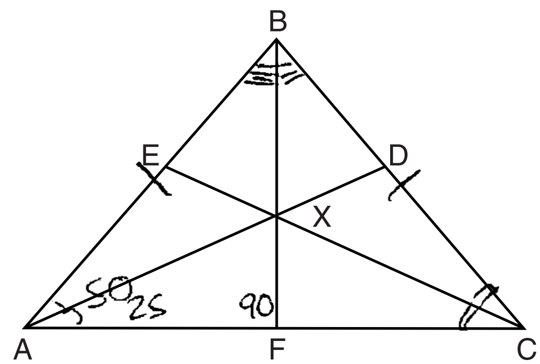
$\triangleright A \cong \measuredangle A$ by something that starts with R.

$\triangle GIA \cong \triangle TNA$

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

Question 30

30 In the diagram below of isosceles triangle ABC, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at X.



If m$\angle BAC$ = 50°, find m$\angle AXC$.

90
+ 25
115

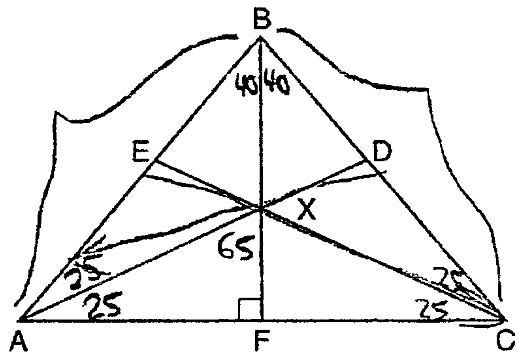
180
− 115
65 x2

m$\angle AXC$ = 130°

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

Question 30

30 In the diagram below of isosceles triangle ABC, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at X.



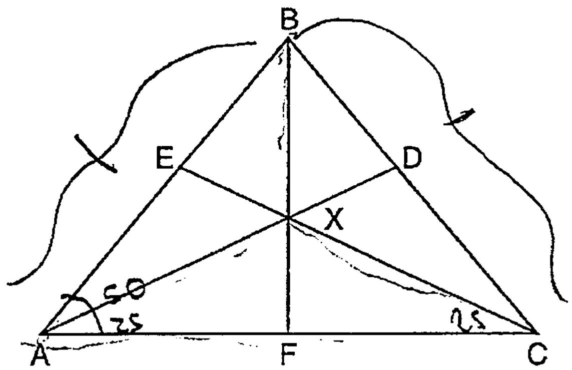
If m$\angle BAC$ = 50°, find m$\angle AXC$.

130°

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

Question 30

30 In the diagram below of isosceles triangle ABC, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at X.



180
- 80
30

If m∠BAC = 50°, find m∠AXC.

m<BAC=50
m< XAF = 25
Δ ABC is Isosocles so the angles oppisite the congruent sides are equal, so m∠BCF is also 50°
$\overline{EC}$ is an angle Bisector so m∠ECA = 25°.

25
+25
50

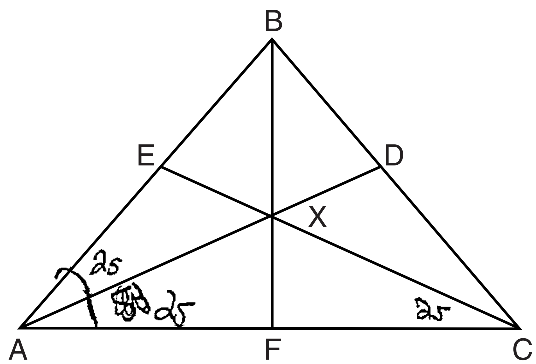
180
- 50
130°

$\boxed{m\angle AXC = 130°}$

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

Question 30

30 In the diagram below of isosceles triangle ABC, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at X.



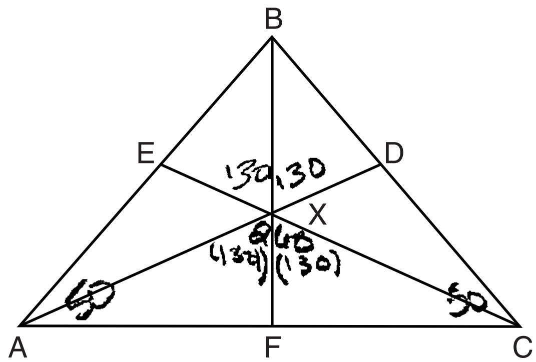
If m∠BAC = 50°, find m∠AXC.

25+25=50
180-50=30
∠AXC=30

Score 1: The student made one computational error.

Question 30

30 In the diagram below of isosceles triangle ABC, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at X.



$$\begin{array}{r} 360 \\ -100 \\ \hline 260 \end{array}$$

$\frac{260}{2} = 130$

If m$\angle BAC$ = 50°, find m$\angle AXC$.

Score 0: The student obtained the correct answer by an incorrect method.

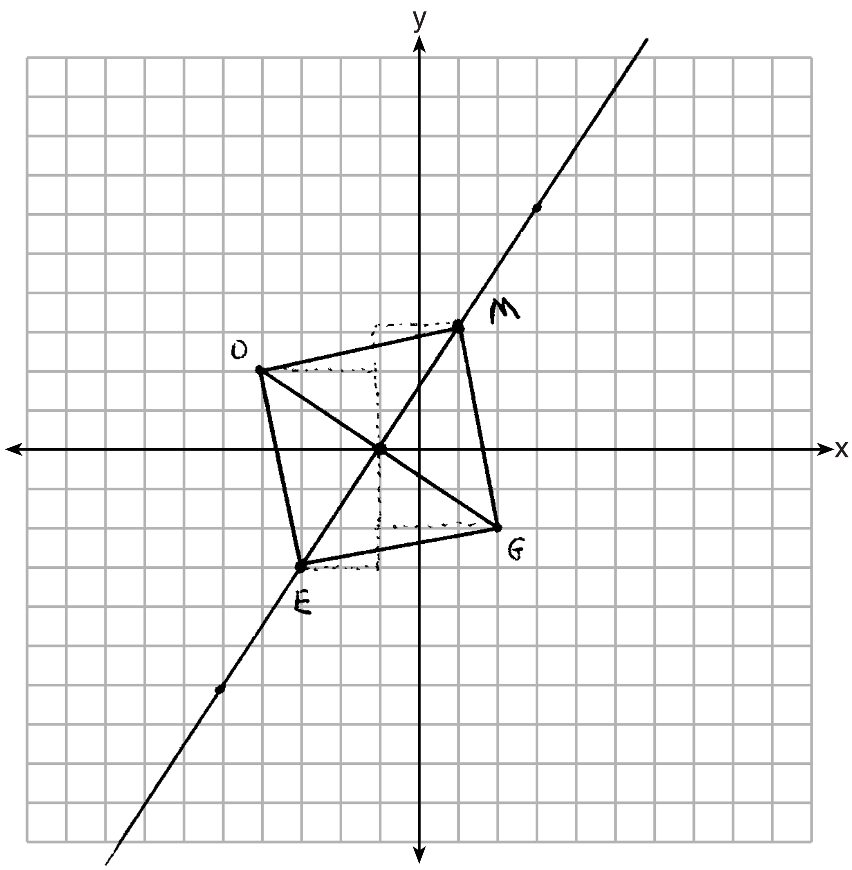
Question 31

31 In square *GEOM*, the coordinates of *G* are $(2,-2)$ and the coordinates of *O* are $(-4,2)$. Determine and state the coordinates of vertices *E* and *M*.

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

M(1,3)

E(-3,-3)



$\overline{GO} \rightarrow \frac{-4}{6} = \frac{-2}{3}$

$\perp \rightarrow \frac{6}{4} = \frac{3}{2}$

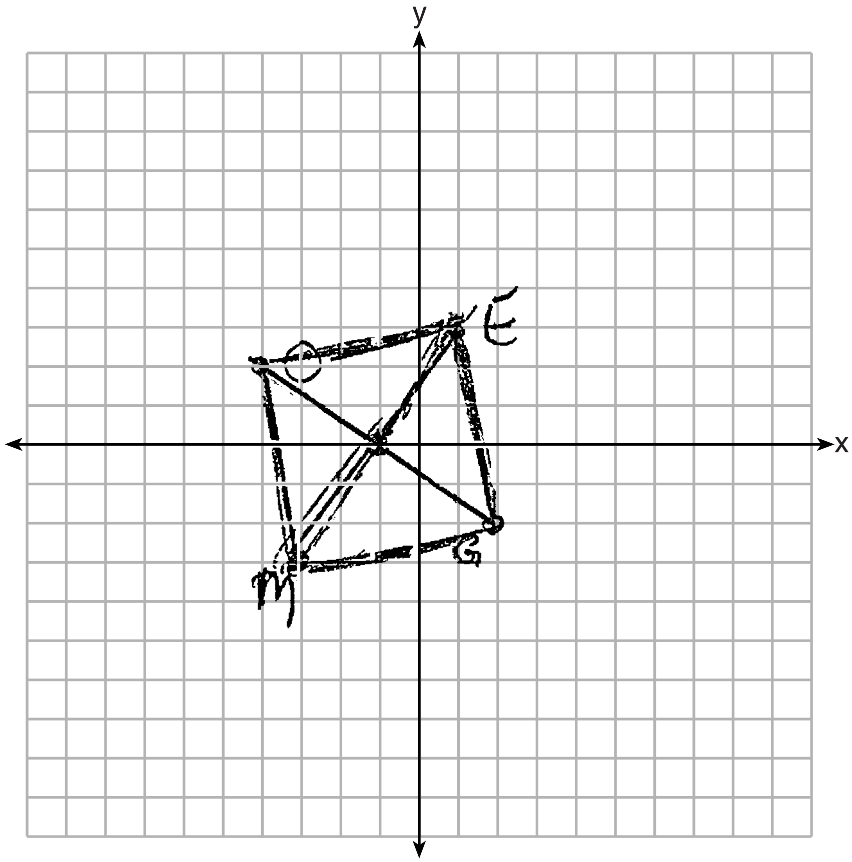
Score 2: The student had a complete and correct response.

Question 31

31 In square *GEOM*, the coordinates of *G* are $(2,-2)$ and the coordinates of *O* are $(-4,2)$. Determine and state the coordinates of vertices *E* and *M*.

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

M (−3,−3) E(1,3)



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

Question 31

31 In square *GEOM*, the coordinates of *G* are (2,−2) and the coordinates of *O* are (−4,2). Determine and state the coordinates of vertices *E* and *M*.

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

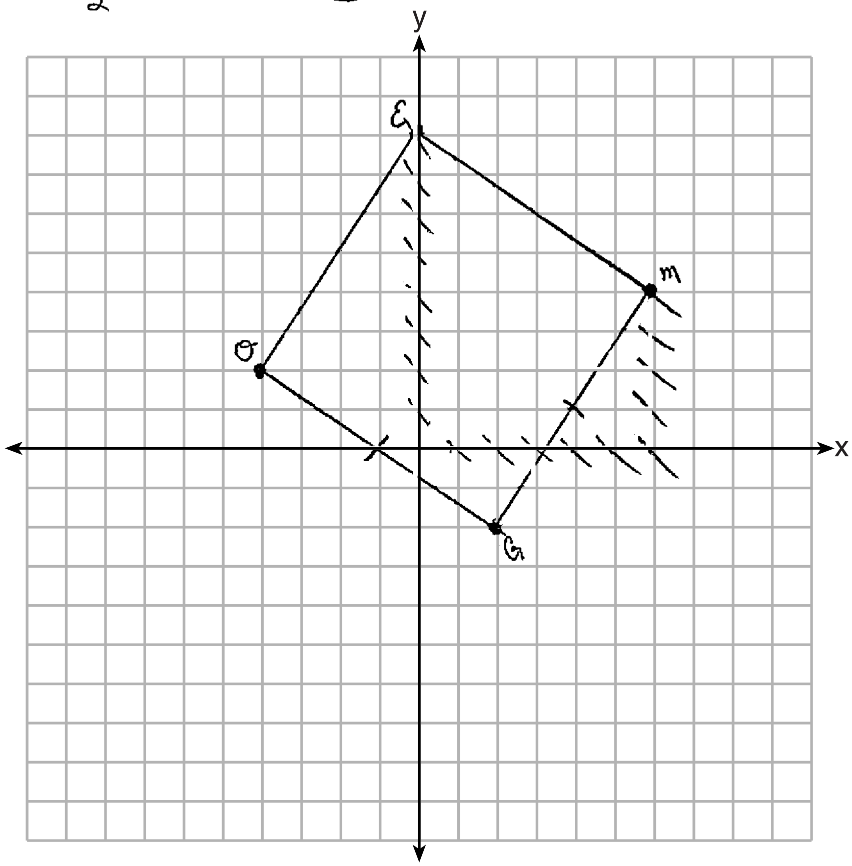
$m=\frac{\Delta y}{\Delta x}$

$m=\frac{2-(-2)}{-4-2}$

$m=\frac{4}{-6}=\frac{2}{-3}$

$\frac{3}{2}$

$\boxed{\begin{array}{c} E(0,8) \\ M(6,4) \end{array}}$



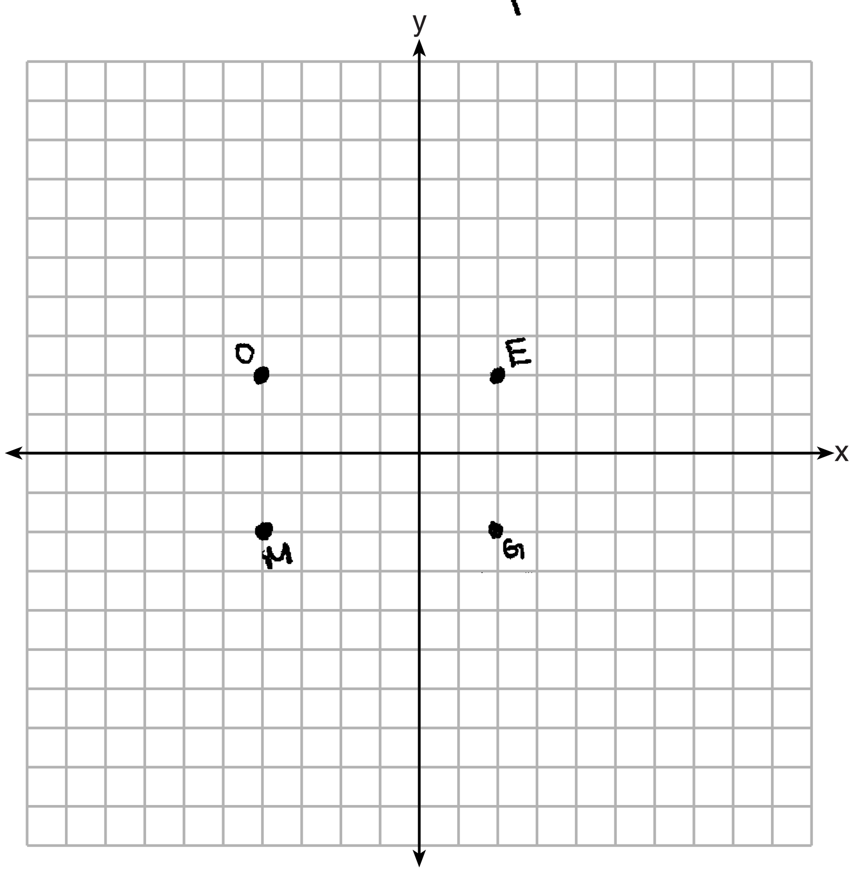
Score 1: The student made an error in the order of the vertices of square *GEOM*.

Question 31

31 In square *GEOM*, the coordinates of *G* are (2,−2) and the coordinates of *O* are (−4,2). Determine and state the coordinates of vertices *E* and *M*.

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

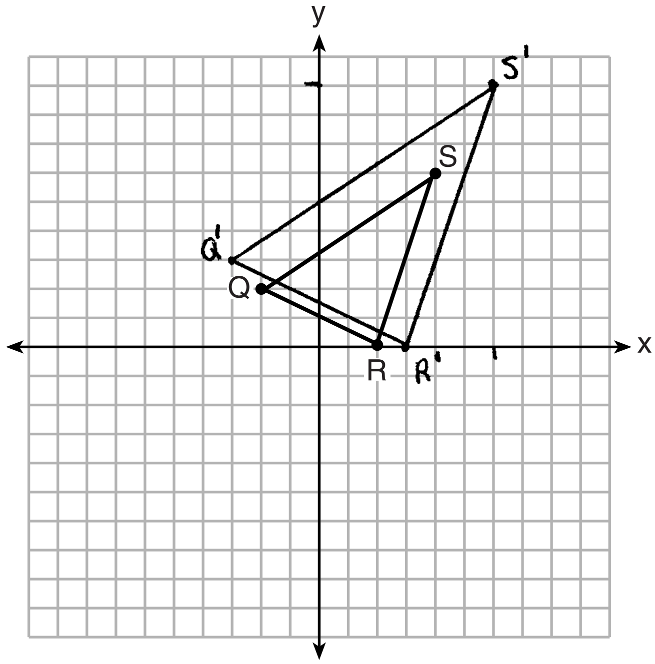
E(2,2)
M(−4,2)



Score 0: The student had a completely incorrect response.

Question 32

32 Triangle QRS is graphed on the set of axes below.



On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

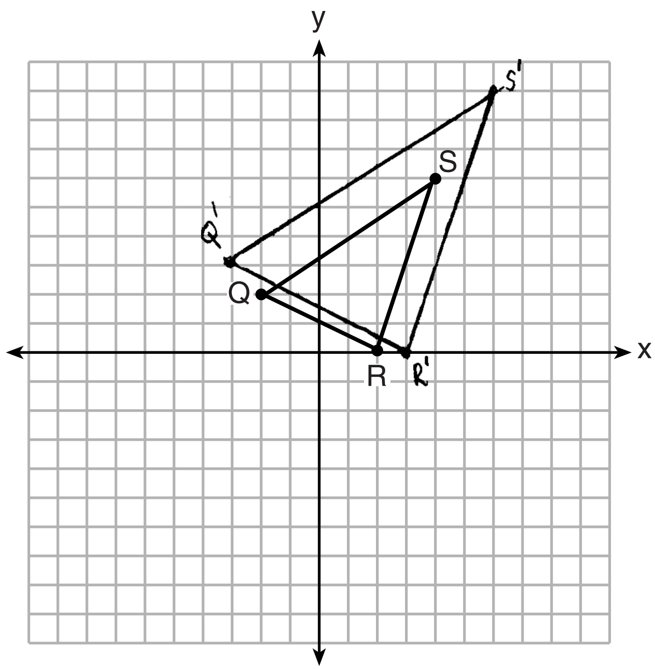
Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

A dilation will preserve the slopes of lines so the slope of $\overline{Q'R'}$ will be the same as the slope of $\overline{QR}$. Because the slopes are equal then $\overline{Q'R'} \parallel \overline{QR}$.

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

Question 32

32 Triangle QRS is graphed on the set of axes below.



R (1,0)
S(4,6)
Q(-2,2)
↓
R'(3 0)
S'(6 ,9)
Q'(-3 .3)

On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

Slope $\overline{QR} = \frac{2}{-4} = \frac{-1}{2}$

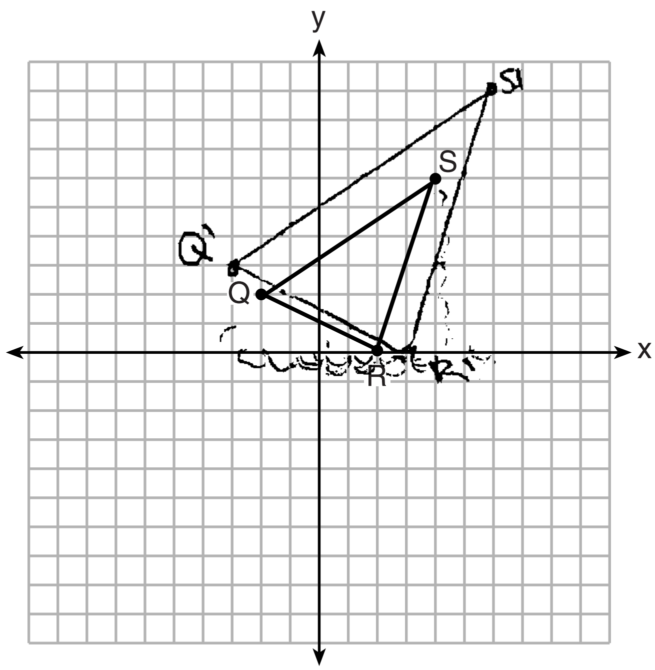
Slope $\overline{Q'R'} = \frac{3}{-6} = \frac{-1}{2}$

$\overline{Q'R'} \parallel \overline{QR}$ b/c they have the Same Slopes, which makes them parallel.

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

Question 32

32 Triangle QRS is graphed on the set of axes below.



On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

$Q(-2,2) \longrightarrow (-3,3)$
$R(2,0) \longrightarrow (3,0)$
$S(4,6) \longrightarrow (6,9)$

Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

$m\overline{Q'R'} = \frac{y_2-y_1}{x_2-x_1} = \frac{0-3}{3-(-3)} = \frac{-3}{6} = \boxed{\frac{-1}{2}}$

$m\overline{QR} = \frac{y_2-y_1}{x_2-x_1} = \frac{0-2}{2+2} = \frac{-2}{4} = \boxed{\frac{-1}{2}}$

$\therefore$, $\overline{Q'R'} \parallel \overline{QR}$ because the slopes are the same.

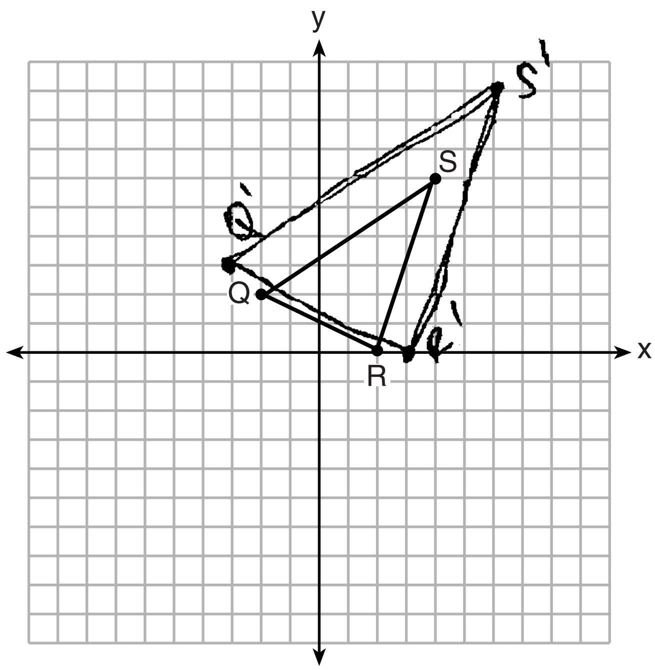
Score 4: The student had a complete and correct response.

Question 32

32 Triangle QRS is graphed on the set of axes below.

$Q \to (-2, 2)$
$R \to (2, 0)$
$S \to (4, 6)$

$Q' \to (-3, 3)$
$R' \to (3, 0)$
$S' \to (6, 9)$



On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

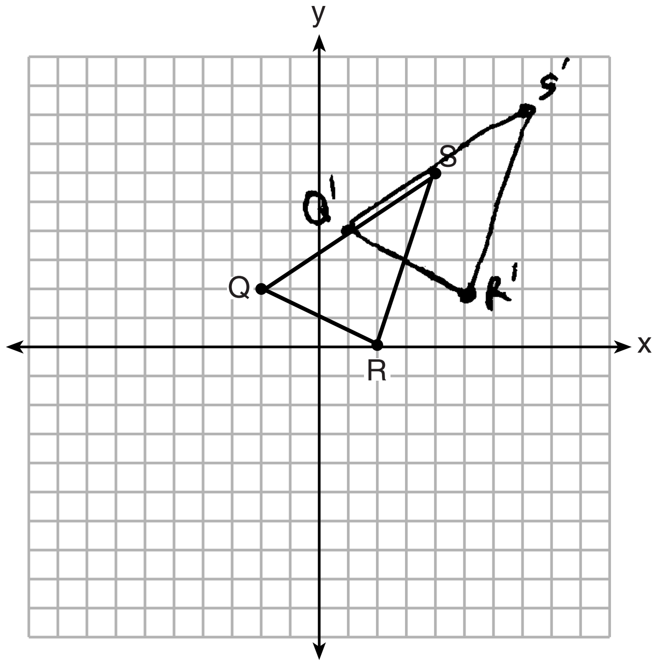
Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

$\overline{Q'R'} \parallel \overline{QR}$ because they have the same slopes. The slope of $\overline{Q'R'}$ is $\frac{3}{6}$ & the slope of $\overline{QR}$ is $\frac{1}{2}$. When $\frac{3}{6}$ is simplified, it becomes $\frac{1}{2}$. Therefore $\overline{Q'R'} \parallel \overline{QR}$.

Score 3: The student made an error in stating the slope is $\frac{1}{2}$.

Question 32

32 Triangle QRS is graphed on the set of axes below.



$Q(-2,2)$ $Q'(1,4)$
$R(2,0)$ $R'(5,2)$
$S(4,6)$ $S'(7,8)$
$\rightarrow 3$ $\uparrow 2$

On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

$$m\overline{QR} = \frac{0-2}{2+2} = \frac{-2}{4} = \frac{-1}{2}$$

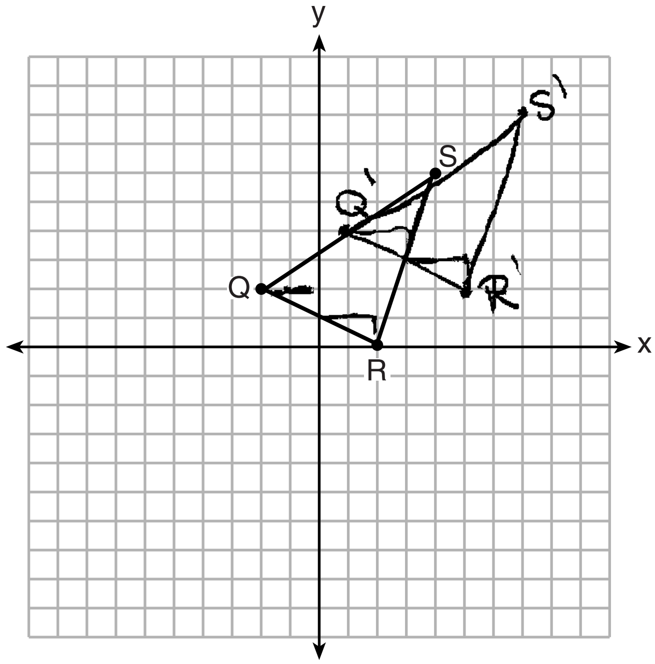
$$m\overline{Q'R'} = \frac{2-4}{5-1} = \frac{-2}{4} = \frac{-1}{2}$$

slopes are =
$\therefore$ lines are $\parallel$

Score 2: The student made an error in the transformation by translating $\triangle QRS$ instead of dilating $\triangle QRS$.

Question 32

32 Triangle QRS is graphed on the set of axes below.



On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

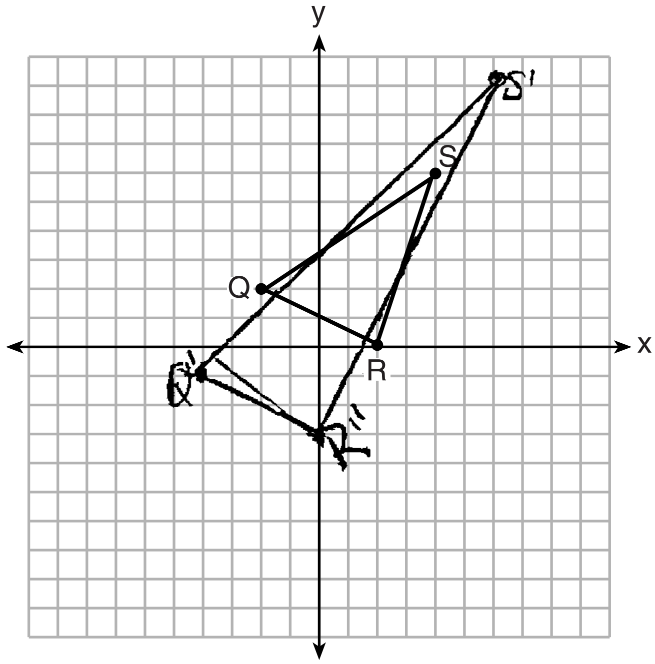
Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

QR has a slope of $\frac{2}{1}$ and Q'R' also has a slope of $\frac{2}{1}$. Because their slopes are congruent, they are parallel.

Score 1: The student transformed $\triangle QRS$ incorrectly and found the incorrect slope. The student correctly interpreted that same slopes form parallel sides.

Question 32

32 Triangle QRS is graphed on the set of axes below.



On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

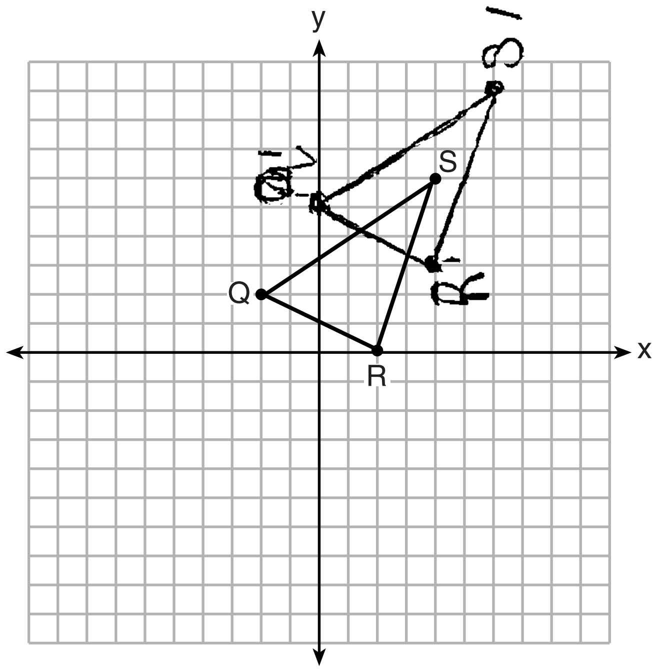
Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

$\overline{QR} = \frac{-2}{4} = \boxed{\frac{-1}{2}}$

$Q'R' = \frac{-2}{4} = \boxed{\frac{-1}{2}}$

Score 1: The student found the appropriate slopes of $\overline{QR}$ and $\overline{Q'R'}$, but no further correct work was shown.

32 Triangle QRS is graphed on the set of axes below.



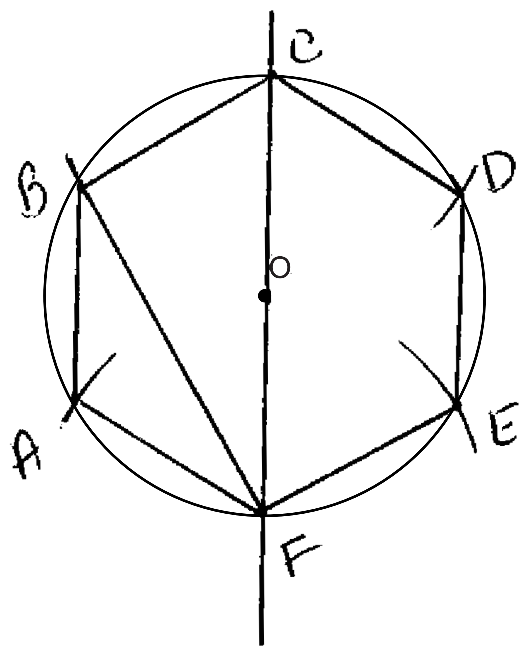
On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.

Use slopes to explain why $\overline{Q'R'} \parallel \overline{QR}$.

They are Parallel because they never touch

Score 0: The student graphed the transformation incorrectly and wrote an incorrect explanation.

33 Using a compass and straightedge, construct a regular hexagon inscribed in circle *O* below. Label it *ABCDEF*. [Leave all construction marks.]



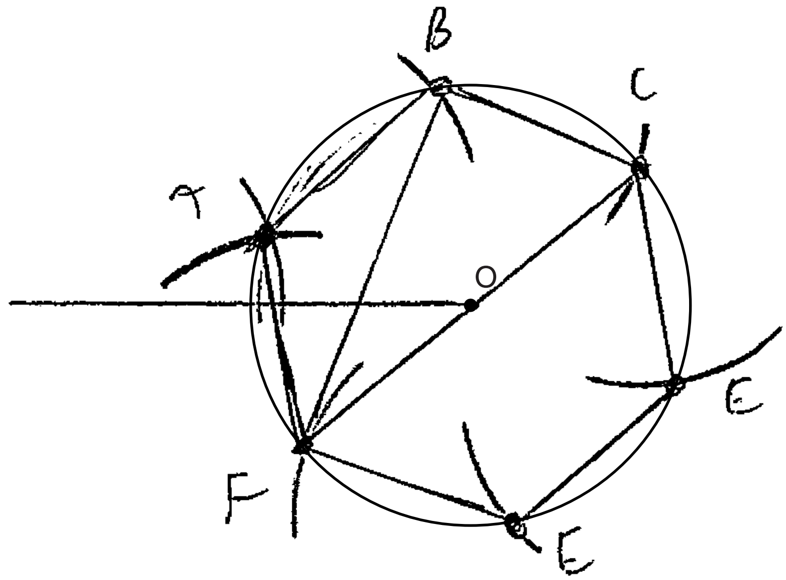
If chords $\overline{FB}$ and $\overline{FC}$ are drawn, which type of triangle, according to its angles, would $\triangle FBC$ be? Explain your answer.

Right Δ, because $\measuredangle CBF$ is inscribed in a semi-circle.

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

Question 33

33 Using a compass and straightedge, construct a regular hexagon inscribed in circle O below. Label it $ABCDEF$. [Leave all construction marks.]



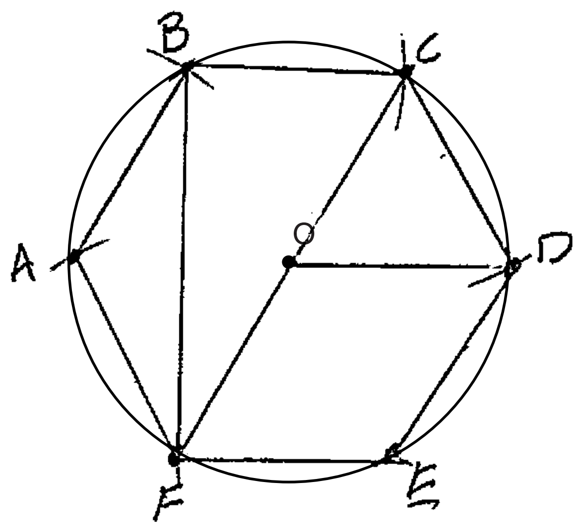
If chords $\overline{FB}$ and $\overline{FC}$ are drawn, which type of triangle, according to its angles, would $\triangle FBC$ be? Explain your answer.

right triangle

Score 3: The student did not write an explanation.

Question 33

33 Using a compass and straightedge, construct a regular hexagon inscribed in circle O below. Label it $ABCDEF$. [Leave all construction marks.]



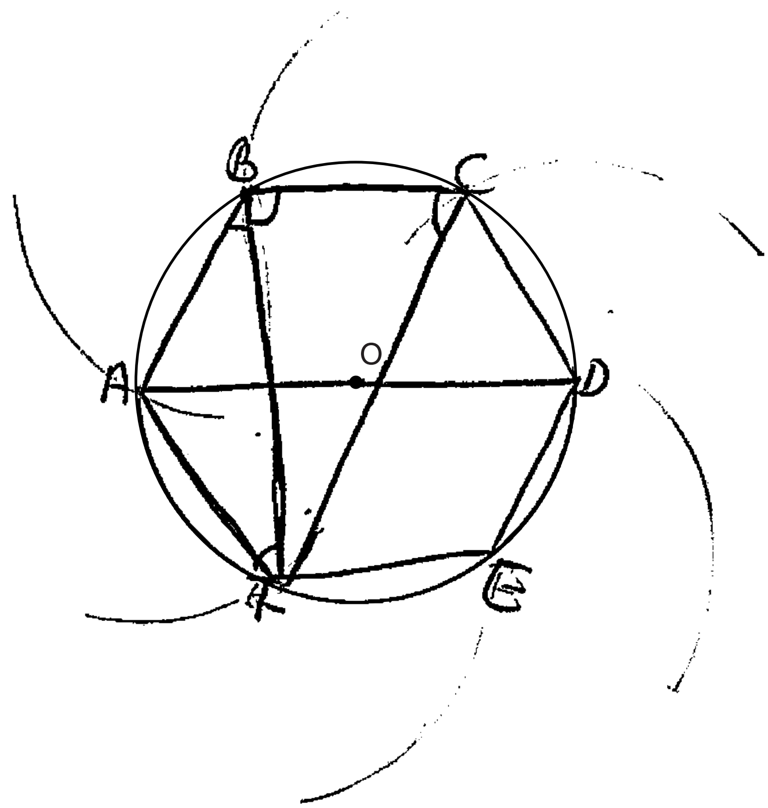
If chords $\overline{FB}$ and $\overline{FC}$ are drawn, which type of triangle, according to its angles, would $\triangle FBC$ be? Explain your answer.

a 30°, 60°, 90° triangle because $\overline{FC}$ is the diameter.

Score 3: The student wrote an incomplete explanation.

Question 33

33 Using a compass and straightedge, construct a regular hexagon inscribed in circle O below. Label it $ABCDEF$. [Leave all construction marks.]



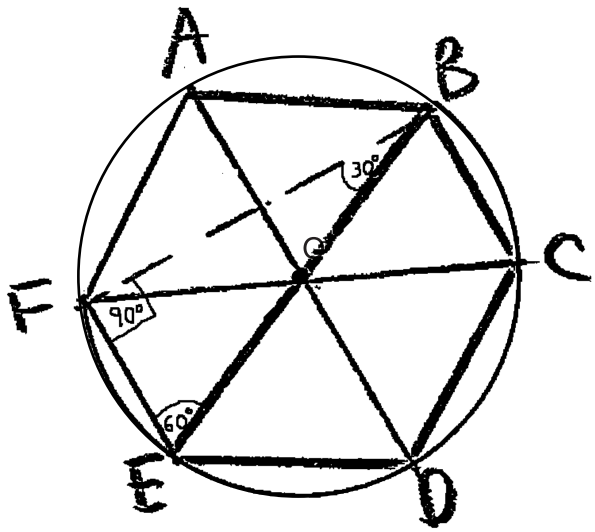
If chords $\overline{FB}$ and $\overline{FC}$ are drawn, which type of triangle, according to its angles, would $\triangle FBC$ be? Explain your answer.

$\triangle$FBC would be an isococles triangle because both base angles <B, <C are equal to each other.

Score 2: The student constructed and labeled the hexagon correctly, but no further correct work was shown.

Question 33

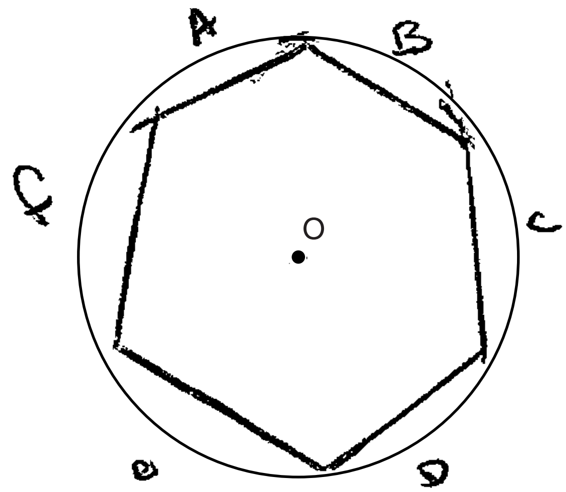
33 Using a compass and straightedge, construct a regular hexagon inscribed in circle *O* below. Label it *ABCDEF*. [Leave all construction marks.]



If chords $\overline{FB}$ and $\overline{FC}$ are drawn, which type of triangle, according to its angles, would $\triangle FBC$ be? Explain your answer. It would be a right triangle

Score 1: The student made a drawing that was not a construction. The triangle was correctly identified as a right triangle, but the explanation was missing.

33 Using a compass and straightedge, construct a regular hexagon inscribed in circle *O* below. Label it *ABCDEF*. [Leave all construction marks.]



If chords $\overline{FB}$ and $\overline{FC}$ are drawn, which type of triangle, according to its angles, would $\triangle FBC$ be? Explain your answer.

a right triangle, because it has a right angle.

Score 0: The student made a drawing that was not a construction. The explanation was incorrect because $\triangle FBC$ cannot be identified according to the student's drawing.

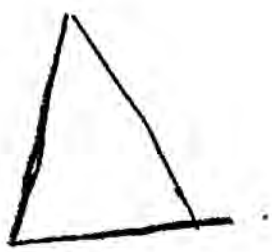
Question 34

34 A candle maker uses a mold to make candles like the one shown below.

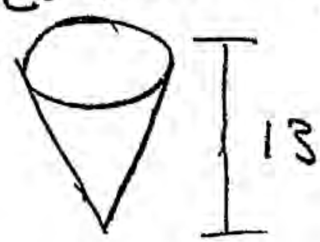
The height of the candle is 13 cm and the circumference of the candle at its widest measure is 31.416 cm. Use modeling to approximate how much wax, to the *nearest cubic centimeter,* is needed to make this candle. Justify your answer.

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(5)^2 13$



$C = 31.416$



$V \approx 340.$

$\frac{31.416}{2\pi} = \frac{2\pi r}{2\pi}$

$r = 5.000$

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

Question 34

34 A candle maker uses a mold to make candles like the one shown below.

The height of the candle is 13 cm and the circumference of the candle at its widest measure is 31.416 cm. Use modeling to approximate how much wax, to the *nearest cubic centimeter,* is needed to make this candle. Justify your answer.

$31.416 = \pi d$

$d = 10.0051$

$r = 5.00255$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(25.0255)(13)$

$V = \frac{1}{3}(325.331)\pi$

$V = 108.444\pi$

$V = 341$

Using the formula for circumference of a circle you find the diameter and radius. Then you use formula for volume of a cone to find the amount of wax needed.

Score 3: The student divided the circumference by 3.14 instead of π.

Question 34

34 A candle maker uses a mold to make candles like the one shown below.

The height of the candle is 13 cm and the circumference of the candle at its widest measure is 31.416 cm. Use modeling to approximate how much wax, to the *nearest cubic centimeter,* is needed to make this candle. Justify your answer.

$\frac{31.416}{2} = 15.708$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(15.708)^2(13)$

$V = \frac{1}{3}\pi(246.741264)(13)$

$V = 1069.212144\pi$

$V = 3359.02$

$\boxed{V = 3359}$

Score 2: The student use an incorrect method to find the radius.

Question 34

34 A candle maker uses a mold to make candles like the one shown below.

The height of the candle is 13 cm and the circumference of the candle at its widest measure is 31.416 cm. Use modeling to approximate how much wax, to the *nearest cubic centimeter,* is needed to make this candle. Justify your answer.

$\frac{31.416}{2} = 15.708$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(15.708)^2(13)$

$= \frac{1}{3}\pi(246.741264)(13)$

$= \frac{1}{3}\pi(3207.636432)$

$= 1069.212144$

$= \boxed{1069\pi}$

Score 1: The student used an incorrect method to find the radius and wrote the volume in terms of π.

Question 34

34 A candle maker uses a mold to make candles like the one shown below.

13 cm

The height of the candle is 13 cm and the circumference of the candle at its widest measure is 31.416 cm. Use modeling to approximate how much wax, to the *nearest cubic centimeter,* is needed to make this candle. Justify your answer.

$C=2\pi r$

$\frac{31.416}{2}=\frac{\cancel{2}\pi r}{\cancel{2}}$

$15.708=\pi r$

$A=\pi r^2$

$A=\pi r^2$

$A=\pi(15.708)^2$

$A=246.741264\pi$

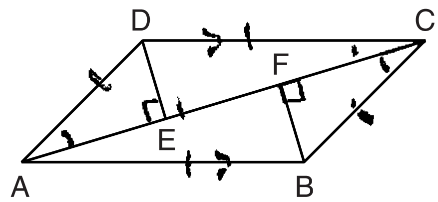
$A=775.1605423$

$\boxed{A=775 \text{ cubic cm}}$

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

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



$\triangle CDE \cong \triangle ABF$

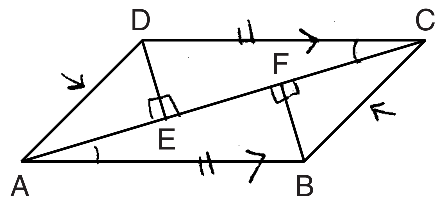
Prove: $\overline{AE} \cong \overline{CF}$

statement	reason
1. quad ABCD $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$	1. given
2. ∠AED and ∠CFB are rt. ∠'s	2. ⊥ lines form rt. ∠'s
3. ∠AED ≅ ∠CFB	3. all rt. ∠'s are ≅
4. ABCD is a parallelogram	4. a quad that has one pair of sides ≅ and ∥ is a parallelogram
5. $\overline{AD} \parallel \overline{BC}$	5. parallelograms have opposite sides ∥.
6. ∠DAE ≅ ∠BCF	6. when 2 ∥ lines are cut by a transversal, alt. int. ∠'s are ≅
7. $\overline{DA} \cong \overline{BC}$	7. parallelograms have 2 pairs of ≅ sides
8. △ADE ≅ △CBF	8. AAS ≅ AAS
9. $\overline{AE} \cong \overline{CF}$	9. CPCTC

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

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



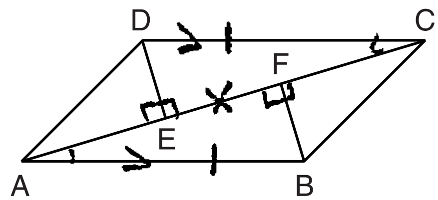
Prove: $\overline{AE} \cong \overline{CF}$

	Statements	Reasons
S	1. Quad. ABCD, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$	1. Given
	2. $\angle DEC$ & $\angle BFA$ are rt. $\angle$s, $\angle DEA$ & $\angle BFC$ are rt. $\angle$s	2. If 2 lines are $\perp$, then they form right $\angle$s.
A	3. $\angle DEC \cong \angle BFA$	3. All rt. $\angle$s are $\cong$.
A	4. $\angle DCE \cong \angle BAF$	4. If 2 // lines are cut by a trans., then alt. int. $\angle$s are $\cong$.
	5. $\triangle DCE \cong \triangle BAF$	5. AAS
S	6. $\overline{AC} \cong \overline{CA}$	6. Reflexive
	7. $\triangle CDA \cong \triangle ABC$	7. SAS
	8. $\triangle DEA$ & $\triangle BFC$ are rt. $\triangle$s	8. If $\triangle$ has a right $\angle$, it is a right $\triangle$.
	9. $\overline{DE} \cong \overline{BF}$, $\overline{DA} \cong \overline{BC}$	9. CPCTC
	10. $\triangle DEA \cong \triangle BFC$	10. HL
	11. $\overline{AE} \cong \overline{CF}$	11. CPCTC

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

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



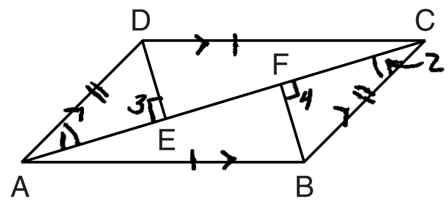
Prove: $\overline{AE} \cong \overline{CF}$

Statments	Reasons
1. Given	1. Given
2. $\measuredangle FAB \cong \measuredangle ECD$	2. $\parallel$ lines Form $\cong$ alt interior $\measuredangle$s
3. $\measuredangle BFE$ and $\measuredangle DEF$ are rt $\measuredangle$s	3. $\perp$ lines Form rt $\measuredangle$s
4. $\measuredangle BFE \cong \measuredangle DEF$	4. All rt $\measuredangle$s $\cong$
5. $\triangle FAB \cong \triangle ECD$	5. AAS $\cong$ AAS
6. $\overline{AF} \cong \overline{EC}$	6. Corresponding Parts of $\cong$ $\triangle$s $\cong$
7. $\overline{EF} \cong \overline{EF}$	7. Reflexive
8. $\overline{AE} \cong \overline{CF}$	8. Subtraction Property

Score 5: The student did not write the given statements in the proof.

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



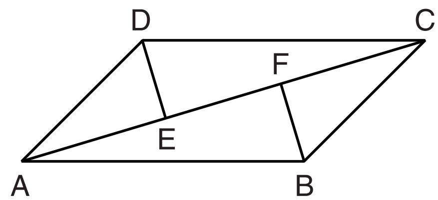
Prove: $\overline{AE} \cong \overline{CF}$

	Statements	Reasons
	① Quad ABCD, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$	① Given
	② ABCD is a parallelogram	② If a quad has one pair of opp sides $\cong$ and $\parallel$, then the quad is a parallelogram
A	③ $\angle 1 \cong \angle 2$	③ Alterate interior $\angle$'s are $\cong$
S	④ $\overline{AD} \cong \overline{CB}$	④ opp sides of a paralelogram are $\cong$
	⑤ $\angle 3, \angle 4$ are RT $\angle$'s	⑤ $\perp$ lines form RT $\angle$'s
A	⑥ $\angle 3 \cong \angle 4$	⑥ All RT $\angle$'s are $\cong$
	⑦ $\triangle ADE \cong \triangle CBF$	⑦ AAS
	⑧ $\overline{AE} \cong \overline{CF}$	⑧ CPCTC

Score 4: The student had one missing statement and reason to prove step 3, and had an incomplete reason in step 3.

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



Prove: $\overline{AE} \cong \overline{CF}$

St.	R.
1) quad $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$	1) given
2) $\measuredangle DEC \cong \measuredangle BFA$ $\measuredangle DEA \cong \measuredangle BFC$	2) All right ∡s are congruent.
3) $\measuredangle DCE \cong \measuredangle BAF$	3) If 2 ∥ lines are cut by a transversal, alt. int. ∡s are ≅.
4) $\triangle DCE \cong \triangle BAF$	4) AAS
5) $\overline{AC} \cong \overline{CA}$	5) Reflexive property
6) $\triangle CDA \cong \triangle ABC$	6) SAS
7) $\overline{DA} \cong \overline{BC}$	7) CPCTC
8) $\triangle DEA \cong \triangle BFC$	8) HL
9) $\overline{AE} \cong \overline{CF}$	9) CPCTC

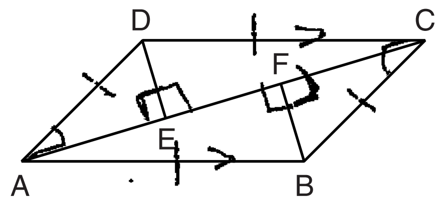
Score 3: The student had one missing statement and reason to prove step 2, and two missing statements and reasons to prove step 8.

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.

AAS

$\triangle ADE \cong \triangle CBF$



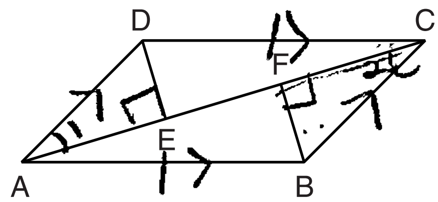
Prove: $\overline{AE} \cong \overline{CF}$

Statements	Reasons
1) Quadrilateral ABCD	1) Given
S 2) $\overline{AD} \cong \overline{CB}$	2) if quadrilateral, then opposite sides are congruent
3) $\overline{AB} \parallel \overline{CD}$	3) Given
A 4) $\angle DAE \cong \angle BCF$	4) if a ∥ lines are crossed by a transversal, than alternate interior ∠'s ≅.
5) $\overline{BF}$ + $\overline{DE}$ are perpendicular to diagonal AC at points F and E	5) Given
6) ∠DEA + ∠BFC are right angles	6) if Perpendicular, than right ∠'s
A 7) ∠DEA ≅ ∠BFC	7) if right ∠'s, then ≅ ∠'s.
8) △DEA ≅ △BFC	8) AAS
9) $\overline{AE} \cong \overline{CF}$	9) CPCTC

Score 2: The student made a conceptual error by not proving that *ABCD* is a parallelogram, and one statement and reason were missing to prove step 4.

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



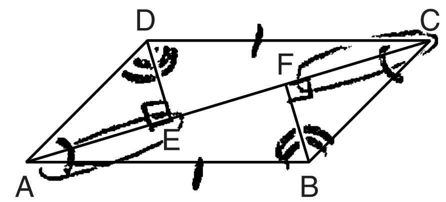
Prove: $\overline{AE} \cong \overline{CF}$

statements	Reasons
① quadrilateral ABCA, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$ $\overline{BF}$ and $\overline{DE}$ are ⊥ to diagonal $\overline{AE}$	① Given
② $\overline{DA} \parallel \overline{CB}$	② quadrilaterals have 2 pairs of ∥ sides.
③ ∠1 ≅ ∠2	③ Alternate interior ∠'s ≅ when lines are ∥
④ △ AED ≅ △CFB	④ AAS ≅ AAS
⑤ $\overline{AE} \cong \overline{CF}$	⑤ CPCTC

Score 1: Only one or two correct relevant statements and reasons are written.

Question 35

35 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



Prove: $\overline{AE} \cong \overline{CF}$

$AB \cong CD$	given
$\overline{AB} \parallel \overline{CD}$	given
$\overline{BF}$ + $\overline{DE} \perp \overline{AC}$	given
$\angle D \cong \angle B$	vertical ∠'s =
$\angle C \cong \angle A$	vertical ∠'s =
$\triangle DFA = \triangle BFC$	∠'s =
$\triangle DEC = \triangle BFA$	∠'s =
$\overline{AE} \cong \overline{CF}$	equal ∠'s + equal length

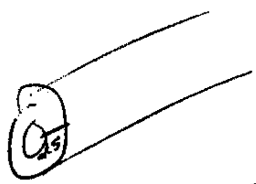
Score 0: The student had a completely incorrect response.

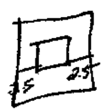
36 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side.

The density of aluminum is 2.7 g/cm^3, and the cost of aluminum is \$0.38 per kilogram.

If all posts must be the same shape, which post design will cost the town less?

How much money will be saved per streetlight post with the less expensive design?





$V = \pi r^2 h - \pi r^2 h$
$V = \pi(26.7)^2(750) - \pi(24.2)^2(750)$
$V = 534667.5\pi - 439230\pi$
$V = 95437.5\pi$
$V = 299825.7489 \text{ cm}^3$

$V = lwh - lwh$
$V = 40 \cdot 40 \cdot 750 - 35^2(750)$
$V = 1200000 - 918750$
$V = 281250 \text{ cm}^3$

Work space for question 36 is continued on the next page.

Question 36 continued

$$\frac{299825.7489\,cm^3}{1}\left(\frac{2.7g}{cm^3}\right)\left(\frac{1kg}{1000g}\right)\left(\frac{\$0.38}{1kg}\right)$$

\$307.6212183

\$307.62

$$\frac{281250\,cm^3}{1}\left(\frac{2.7g}{cm^3}\right)\left(\frac{1kg}{1000g}\right)\left(\frac{\$.38}{1kg}\right)$$

\$288.5625

\$288.56

$$\begin{array}{r} 307.62 \\ -\ 288.56 \\ \hline \end{array}$$

\$19.06 saved to use the rectangles

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

36 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side.

The density of aluminum is 2.7 g/cm^3, and the cost of aluminum is \$0.38 per kilogram.

If all posts must be the same shape, which post design will cost the town less?

How much money will be saved per streetlight post with the less expensive design?

$V = \pi r^2 h$

$V = \pi (26.7)^2 (750)$

$V = 1679707.49 \text{ cm}^3$

$V = \pi (24.2)^2 (750)$

$V = 1379881.741 \text{ cm}^3$

$1679707.49 - 1379881.741$

$V = 299825.7488$

$\times \quad 2.7$

$\frac{809529.5218}{1000}$

809.5295218

$\times \quad .38$

\$307.62

$V = lwh$

$V = (40)(40)(750)$

$V = 1200000$

$V = (37.5)(37.5)(750)$

$V = 1054687.5$

$1200000 - 1054687.5$

$V = 145312.5$

$\times \quad 2.7$

$\frac{392343.75}{1000}$

392.3475

$\times \quad .38$

\$149.09

Work space for question 36 is continued on the next page.

Question 36

Question 36 continued

$$\begin{array}{r} 307.62 \\ -149.09 \\ \hline 158.53 \end{array}$$

Rectangular Poles are cheaper
by $158.53 per pole

Score 5: The student only subtracted 2.5 cm once when finding the volume of the rectangular prism.

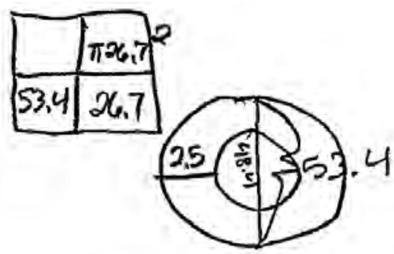
Question 36

36 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side.

The density of aluminum is 2.7 g/cm^3, and the cost of aluminum is $0.38 per kilogram.

If all posts must be the same shape, which post design will cost the town less?

How much money will be saved per streetlight post with the less expensive design?



$53.4 - 5 = 48.4$

$A = \pi 26.7^2 = 2239.6100$

$A = \pi 24.2^2 = 1839.8423$

$2239.6100 - 1839.8423 =$

$399.7677 \times 7.5 = 2998.2578 cm^3$

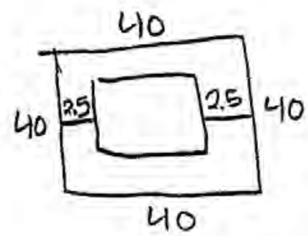
$2998.2578 \times 2.7 = 8095.2961$

$8095.2961 \times 0.38 = \$3076.21$

Work space for question 36 is continued on the next page.

Question 36

Question 36 continued



$A = 40 \times 40 = 1600$

$A = 35 \times 35 = 1225$

$1600 - 1225 = 375$

$375 \times 7.5 = 2812.5 \text{ cm}^3$

$2812.5 \times 2.7 = 7593.75$

$7593.75 \times 0.38 = \$2885.63$

The rectangular-prism design will cost less and you will be saving \$190.58 per street light

Score 4: The student did not perform either conversion required by the problem.

Question 36

36 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side.

The density of aluminum is 2.7 g/cm^3, and the cost of aluminum is \$0.38 per kilogram.

If all posts must be the same shape, which post design will cost the town less?

How much money will be saved per streetlight post with the less expensive design?

Volume of Rect. Prism

$V = lwh$ $V = lwh$

$= (40)(40)(750)$ $= (35)(35)(750)$

$= 1,200,000$ $= 918,750$

$V = 281,250 \text{ cm}^3$

$\times 2.7$

$\dfrac{759,375}{1000} = 759.\cancel{357}.375 \text{ kg}$

$\times .38$

\$ 288.56

Volume of Cylindar

$V = \pi r^2 h$ $V = \pi r^2 h$

$= \pi (53.4)^2 (7.5)$ $= \pi (50.9)^2 (7.5)$

$= 67188.2996$

$= 61044.52247$

Work space for question 36 is continued on the next page.

Question 36

Question 36 continued

Score 3: The student found the cost for the rectangular prism post, but no further correct work was shown.

36 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side.

The density of aluminum is 2.7 g/cm^3, and the cost of aluminum is \$0.38 per kilogram.

If all posts must be the same shape, which post design will cost the town less?

How much money will be saved per streetlight post with the less expensive design?

$7.5 \cdot 40^2 - 37.5^2$ = Square base

$1600 - 1406.25 = 193.75$

$7.5 \cdot 193.75 = 1453.125\ cm^3$

$7.5 \cdot 53.4^2\pi - 50.9^2\pi$ = Cylindrical base

$7.5 \cdot 819.77 = 6143.78\ cm^3$

$6143.78 \times 2.7 = 16588g$

$1453.125 \times 2.7 = \frac{3923}{1000}g$

3.923 kg

16.588 kg

-6.30

\$1.49

\$4.81 saved per pole

Work space for question 36 is continued on the next page.

Question 36 continued

Score 2: The student's procedure was correct, but contained multiple errors, such as using the diameter instead of the radius. The student stated an appropriate cost difference, but did not identify which post design will cost less.

Question 36

36 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side.

The density of aluminum is 2.7 g/cm^3, and the cost of aluminum is \$0.38 per kilogram.

If all posts must be the same shape, which post design will cost the town less?

How much money will be saved per streetlight post with the less expensive design?

$V = \pi r^2 h$

$V = \pi (53.4)^2 (750)$

$V = 6718829.96$

$V = \pi (48.4)^2 (750)$

$V = 5519526.965$

$V = lwh$

$V = (40)(40)(750)$

$V = 1200000$

$V = (35)(35)(750)$

$V = 918750$

$V_{rect} = 281250$

$V_{cylinder} = 1199302.995$

$$\begin{array}{r} 1199302.995 \\ -\ 281250 \\ \hline 918052.995 \\ \times\ .38 \end{array}$$

\$348860.14 cheaper for rectangular poles

Work space for question 36 is continued on the next page.

Question 36 continued

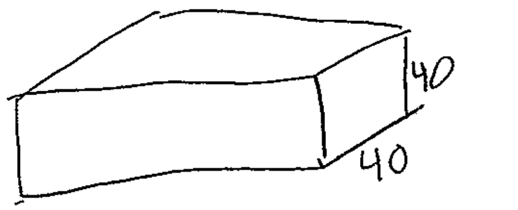
Score 1: The student found the volume of only one post, and no further correct relevant work was shown.

36 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side.

The density of aluminum is 2.7 g/cm^3, and the cost of aluminum is \$0.38 per kilogram.

If all posts must be the same shape, which post design will cost the town less?

How much money will be saved per streetlight post with the less expensive design?



$V = lwh$
$V = 2.5(40)(40)$
$V = 4{,}000 \text{ cm}^3$

$V = \pi r^2 h$
$V = \pi \cdot (26.7)^2 \, 7.5$
$V = 16{,}797.0749$

The post shaped like a rectangular prism would cost less because it is smaller so it it'll need less aluminum.

Work space for question 36 is continued on the next page.

Question 36

Question 36 continued

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