The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Friday, June 19, 2015 — 1:15 p.m.

SAMPLE RESPONSE SET

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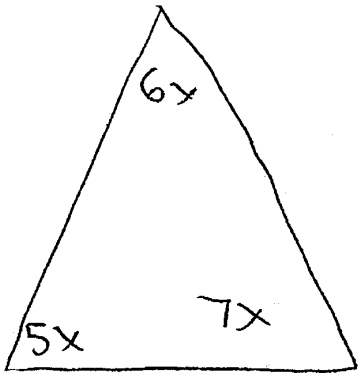
Question 29

29 The measures of the angles of a triangle are in the ratio 5:6:7. Determine the measure, in degrees, of the *smallest* angle of the triangle.



$5x + 6x + 7x = 180$

$\frac{18x}{18} = \frac{180}{18}$

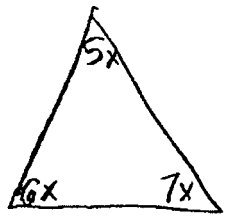
$x = 10$

smallest angle: 50°

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

Question 29

29 The measures of the angles of a triangle are in the ratio 5:6:7. Determine the measure, in degrees, of the *smallest* angle of the triangle.



180 ÷ 18 = 10

6 × 10 = 60

7 × 10 = 70

5 × 10 = 50

180

50

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

Question 29

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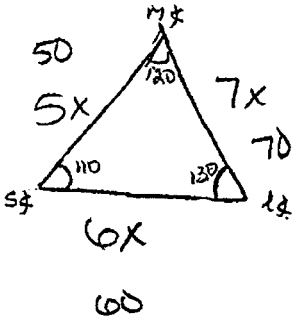


$5x+6x+7x=180$

$\frac{18x}{18}=\frac{180}{18}$

$x=10$

$5(10)=50$

$6(10)=60$

$7(10)=70$

$180-50=130$

$180-60=120$

$180-70=110$

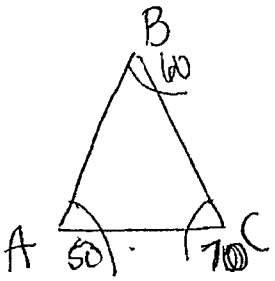
the smallest angle = 110°

130
120
+ 110
360

Score 1: The student made a conceptual error.

Question 29

29 The measures of the angles of a triangle are in the ratio 5:6:7. Determine the measure, in degrees, of the *smallest* angle of the triangle.

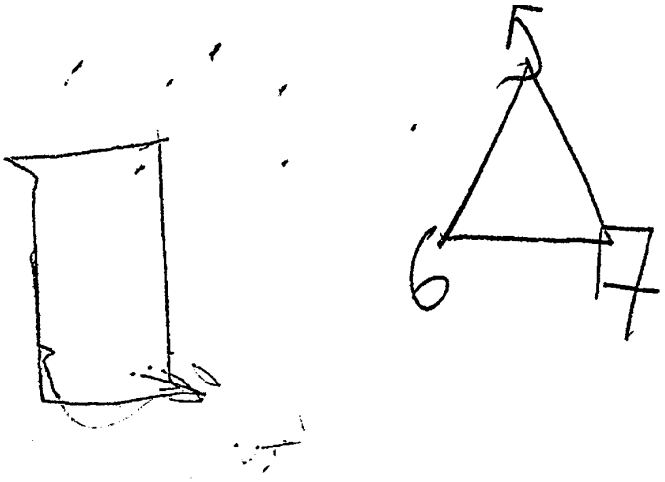


∡ 50°

Score 1: The student showed no work.

Question 29

29 The measures of the angles of a triangle are in the ratio 5:6:7. Determine the measure, in degrees, of the *smallest* angle of the triangle.



$\frac{18x}{18} = \frac{360}{18}$

$x = 20$

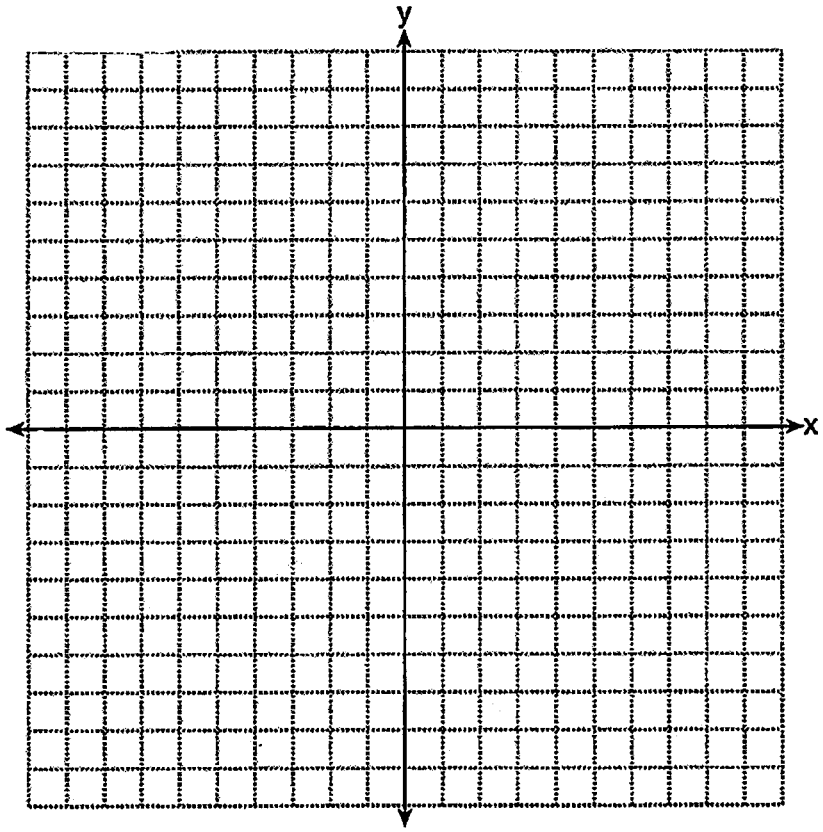
Score 0: The student made a conceptual error and did not find the measure of the smallest angle.

Question 30

30 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$.

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

A(-1,1) $\xrightarrow{r_{y=x}}$ A'(1,-1)
B(1,3) $\xrightarrow{r_{y=x}}$ B'(3,1)
C(4,1) $\xrightarrow{r_{y=x}}$ C'(1,4)



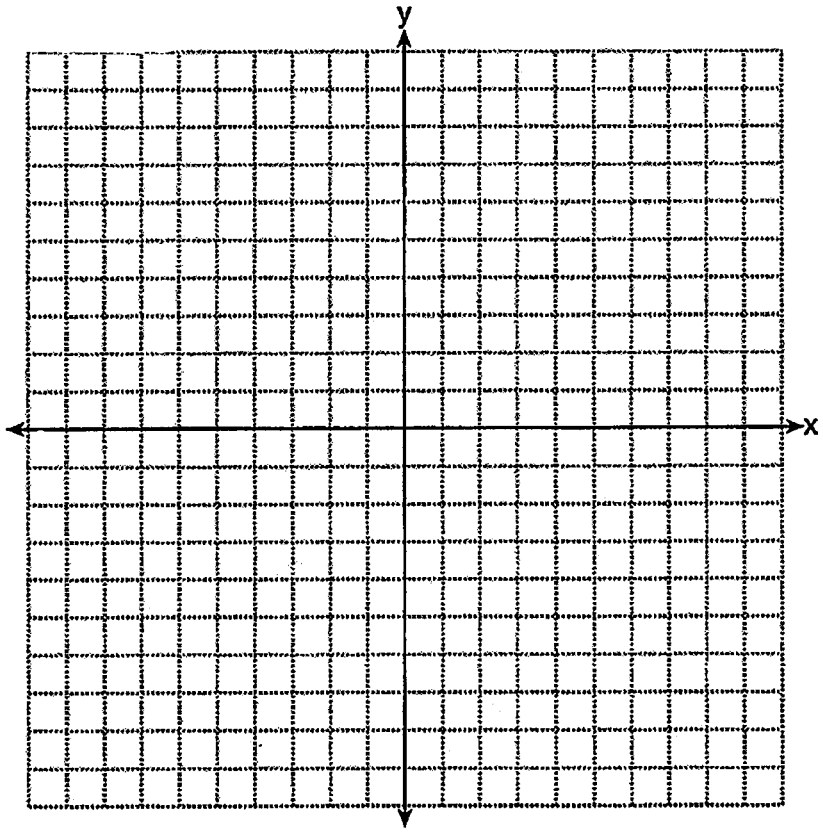
Score 2: The student had a complete and correct response.

Question 30

30 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$.

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

A(-1, 1) → (1, -1)
B(1, 3) → (3, 1)
C(4, 1) → (1, 4)
$r_{y=x}$



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

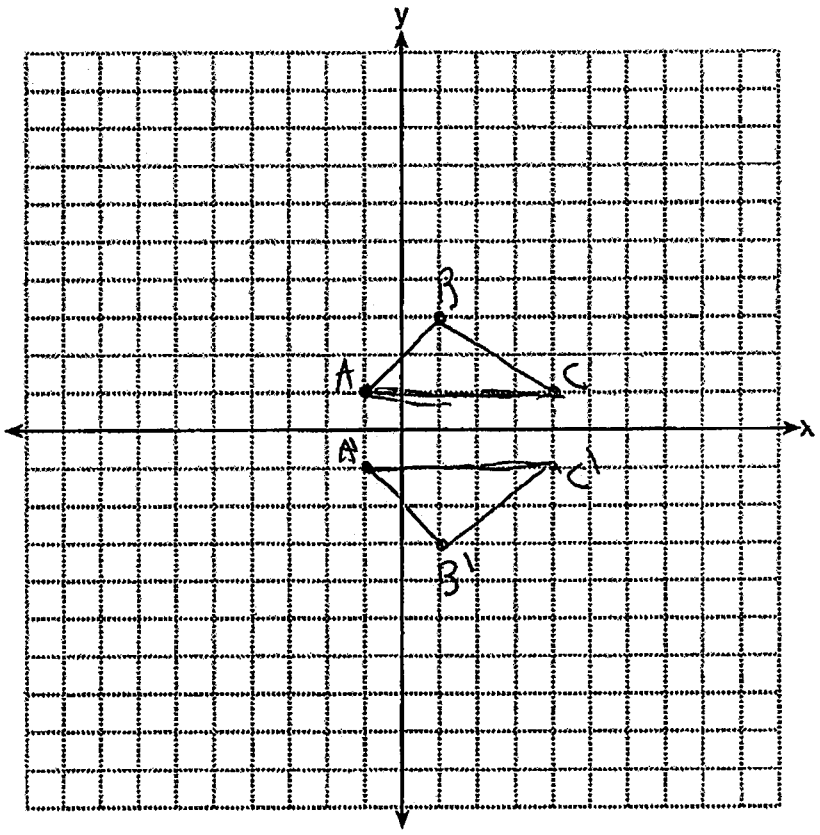
Question 30

30 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$.

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

NEGATE Y COORDINATES WHEN REFLECTING THROUGH THE X-AXIS.

A1 = (-1, -1)
B1 = (1, -3)
C1 = (4, -1)



Score 1: The student made one conceptual error by reflecting over the x-axis, but appropriate points were stated and labeled.

Question 30

30 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$.

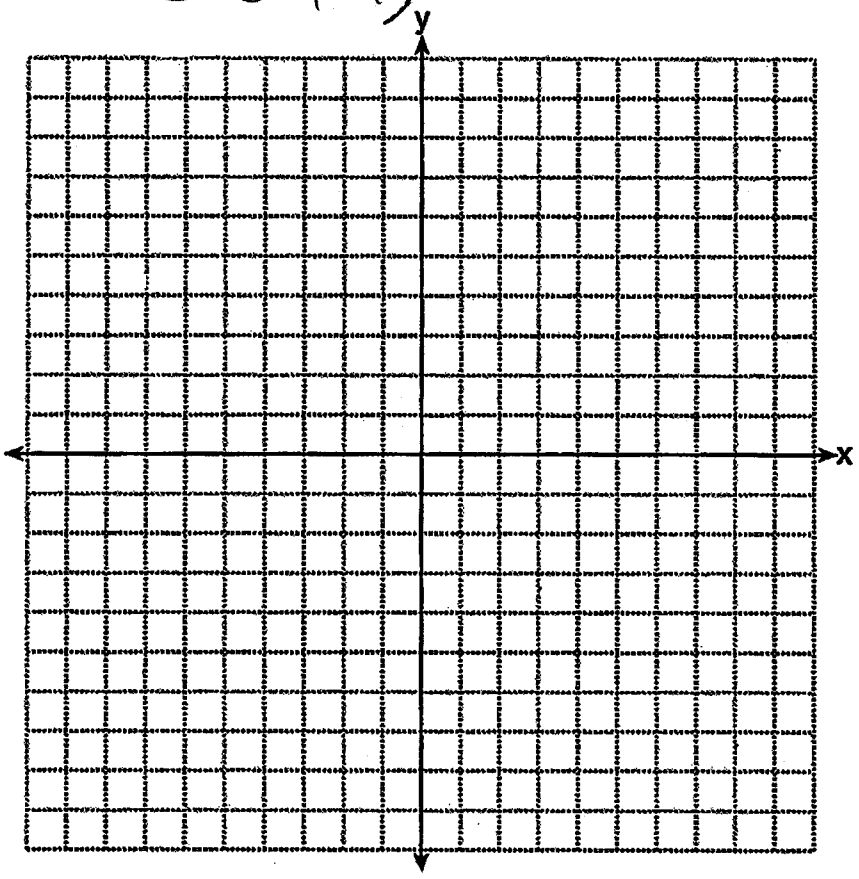
[The use of the set of axes below is optional.]

$(a,b) \rightarrow (b,a)$

$A'(1,-1)$

$B'(3,1)$

$C'(-1,4)$

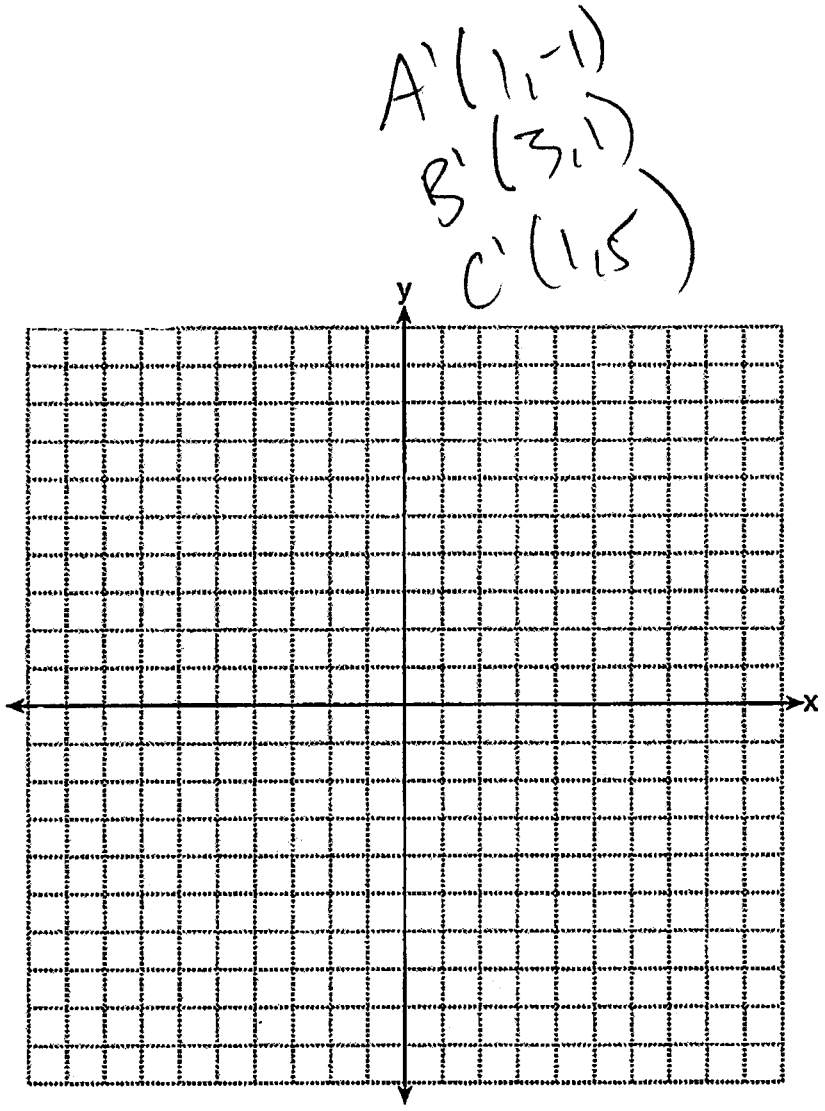


Score 1: The student made an error in finding C'.

Question 30

30 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$.

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



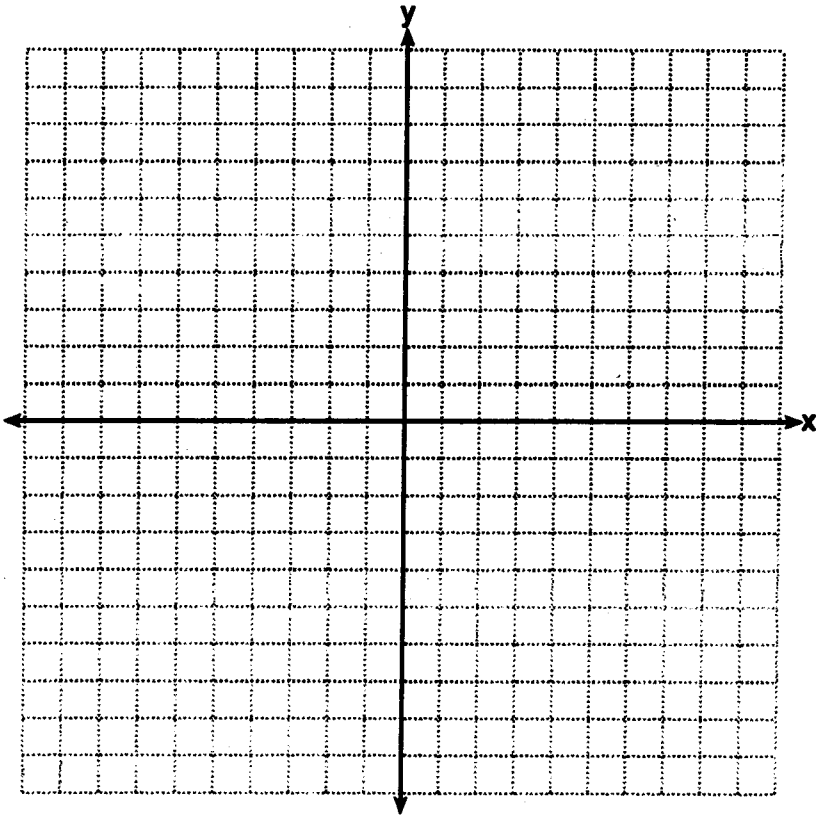
Score 1: The student stated and labeled two points correctly.

Question 30

30 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$.

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

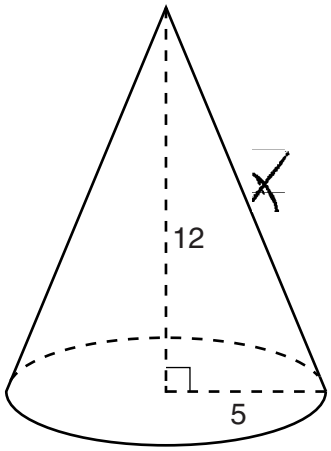
(-1,-1)
(1,-3)
(4,-1)



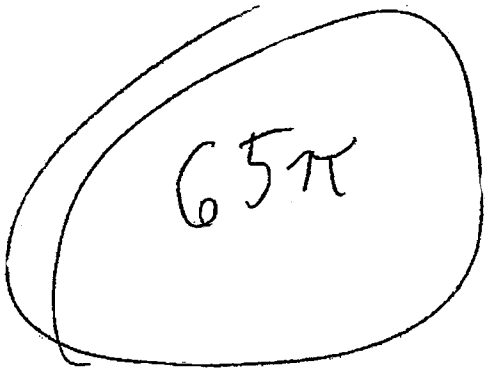
Score 0: The student made a conceptual error by reflecting across the x-axis and did not label the coordinates.

Question 31

31 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



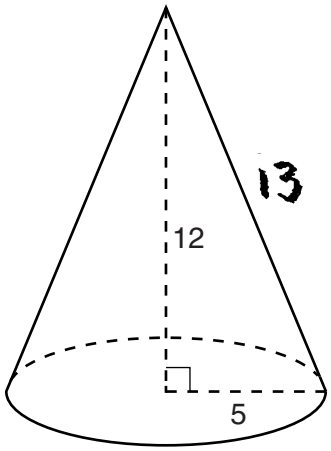
Determine, in terms of π, the lateral area of the right circular cone.



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

Question 31

31 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



$12^2+5^2=c^2$

$144+25=c^2$

$\sqrt{169}=\sqrt{c^2}$

$c=13$

Determine, in terms of π, the lateral area of the right circular cone.

$L=\pi r l$

$L=\pi 5(13)$

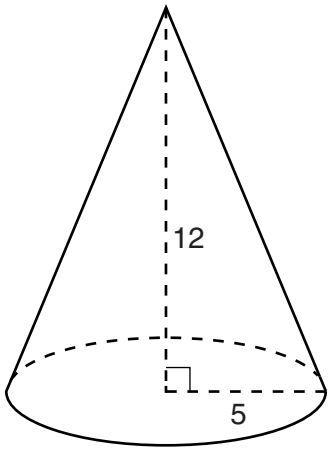
$L=\pi 65$

$L=204.2035225$

Score 1: The student found 65π, but indicated a decimal as the final answer.

Question 31

31 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



Determine, in terms of π, the lateral area of the right circular cone.

$L = \pi r l$

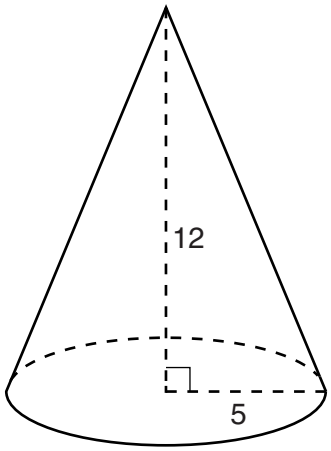
$L = \pi(5)(12)$

$L = 60\pi$

Score 1: The student made a conceptual error in finding a lateral area of 60π.

Question 31

31 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



Determine, in terms of π, the lateral area of the right circular cone.

$5^2 + 12^2 = l^2$

$25 + 144 = l^2$

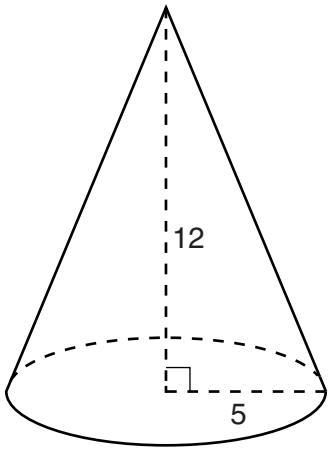
$169 = l^2$

$l = 13$

Score 1: The student showed work to find the slant height, but no further work was shown.

Question 31

31 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



Determine, in terms of π, the lateral area of the right circular cone.

$L = \pi rl$

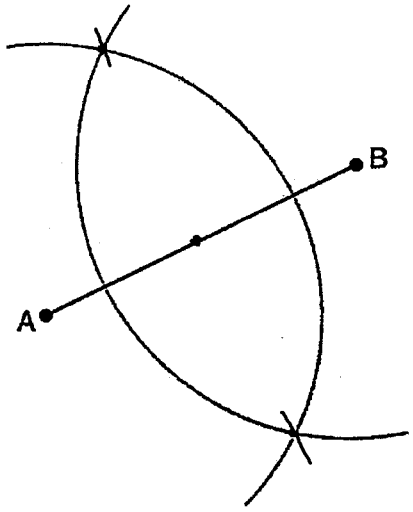
$L = \pi \cdot 5 \cdot 12$

$L = 188.5$

Score 0: The student made a conceptual error, did not simplify the lateral area in terms of π, and expressed the answer as a rounded decimal.

Question 32

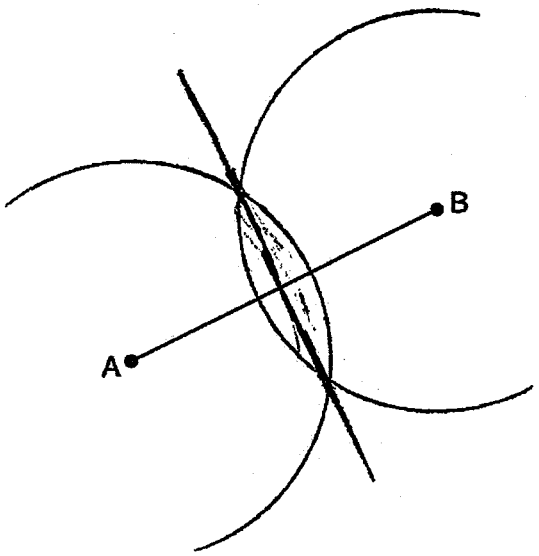
32 Using a compass and straightedge, locate the midpoint of $\overline{AB}$ by construction. [Leave all construction marks.]



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

Question 32

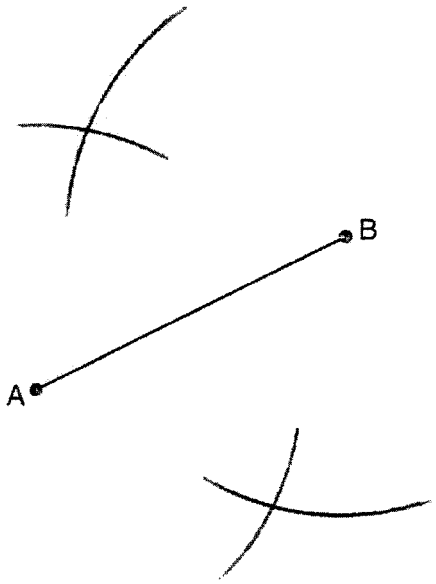
32 Using a compass and straightedge, locate the midpoint of $\overline{AB}$ by construction. [Leave all construction marks.]



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

Question 32

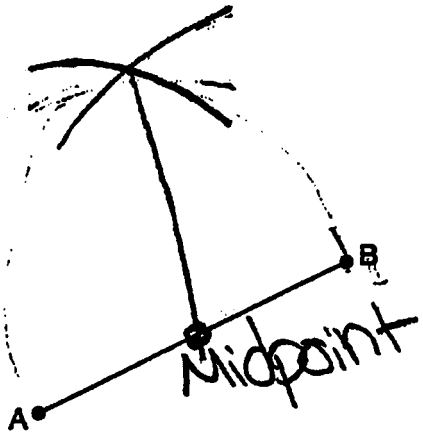
32 Using a compass and straightedge, locate the midpoint of $\overline{AB}$ by construction.
[Leave all construction marks.]



Score 1: The student showed all appropriate arcs, but the midpoint was not located.

Question 32

32 Using a compass and straightedge, locate the midpoint of $\overline{AB}$ by construction. [Leave all construction marks.]



Score 0: The student had a completely incorrect response.

Question 33

33 The coordinates of the endpoints of $\overline{CD}$ are $C(3,8)$ and $D(6,-1)$. Express the length of $\overline{CD}$ in simplest radical form.

a $\overline{CD} = \sqrt{(6-3)^2 + (-1-8)^2}$

$= \sqrt{(3)^2 + (-9)^2}$

$= \sqrt{9 + 81}$

$= \sqrt{90}$

$= \sqrt{9 \cdot 10}$

$= 3\sqrt{10}$

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

Question 33

33 The coordinates of the endpoints of $\overline{CD}$ are $C(3,8)$ and $D(6,-1)$. Express the length of $\overline{CD}$ in simplest radical form.

Distance of $\overline{CD} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

Distance of $\overline{CD} = \sqrt{(6-3)^2+(-1-8)^2}$

Distance of $\overline{CD} = \sqrt{(3)^2+(-9)^2}$

Distance of $\overline{CD} = \sqrt{9+81}$

Distance of $\overline{CD} = \sqrt{90}$

Distance of $\overline{CD} = \sqrt{9}\sqrt{10}$

Distance of $\overline{CD} = 3\sqrt{5}\sqrt{2}$

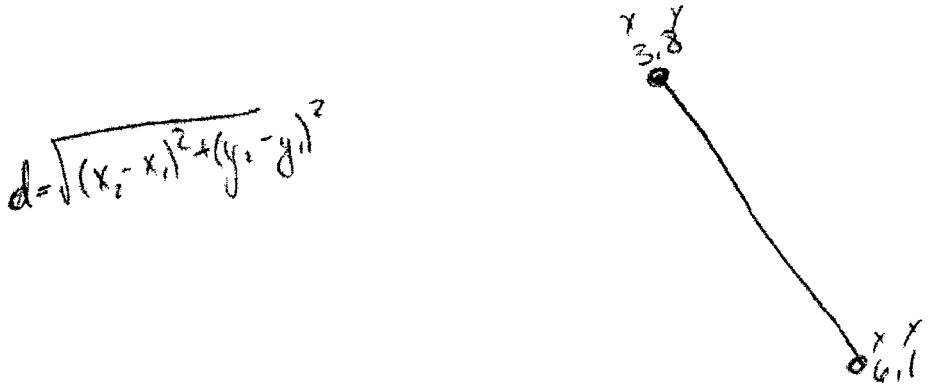
Distance of $\overline{CD} = 3 \cdot 2\sqrt{5}$

Distance of $\overline{CD} = 6\sqrt{5}$

Score 1: The student made an error when simplifying $\sqrt{90}$.

Question 33

33 The coordinates of the endpoints of $\overline{CD}$ are $C(3,8)$ and $D(6,-1)$. Express the length of $\overline{CD}$ in simplest radical form.



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

$= (3 - 6)^2 + (8 - -1)^2$

$-3^2 + 7^2$

$9 + 49$

$\sqrt{56}$

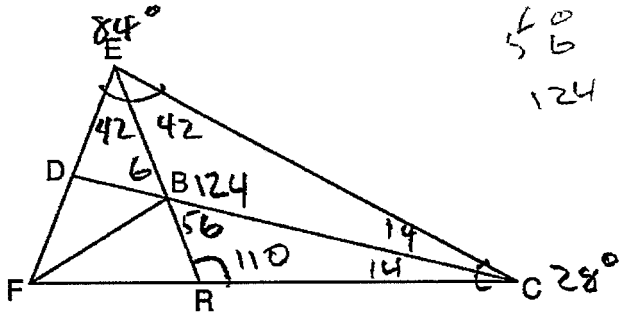
$\sqrt{4}\sqrt{14}$

$2\sqrt{14}$ = length of $\overline{CD}$

Score 0: The student made a transcription error when plotting point D and a computational error in calculating the length of $\overline{CD}$.

Question 34

34 In the diagram below, point B is the incenter of $\triangle FEC$, and $\overline{EBR}$, $\overline{CBD}$, and $\overline{FB}$ are drawn.



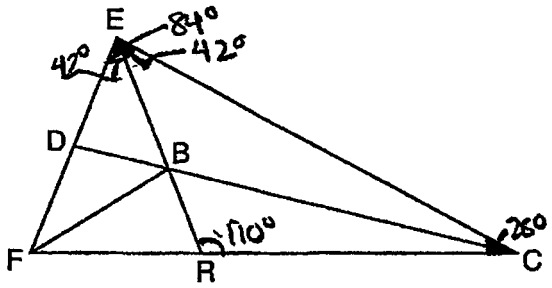
If $m\angle FEC = 84$ and $m\angle ECF = 28$, determine and state $m\angle BRC$.

110

Score 2: The student had a complete and correct response. Angle measures for both $\triangle BCE$ and $\triangle BCR$ were labeled on the diagram.

Question 34

34 In the diagram below, point B is the incenter of $\triangle FEC$, and $\overline{EBR}$, $\overline{CBD}$, and $\overline{FB}$ are drawn.



If m$\angle FEC$ = 84 and m$\angle ECF$ = 28, determine and state m$\angle BRC$.

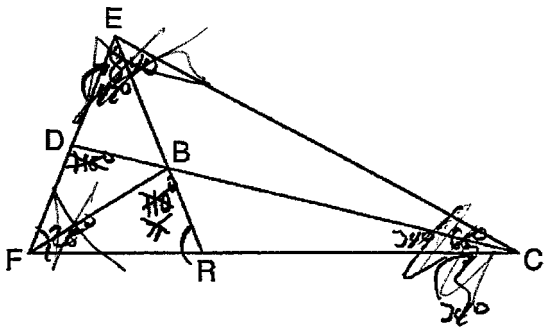
42
+ 28
180 − 70 = 110°

m∠BRC = 110°

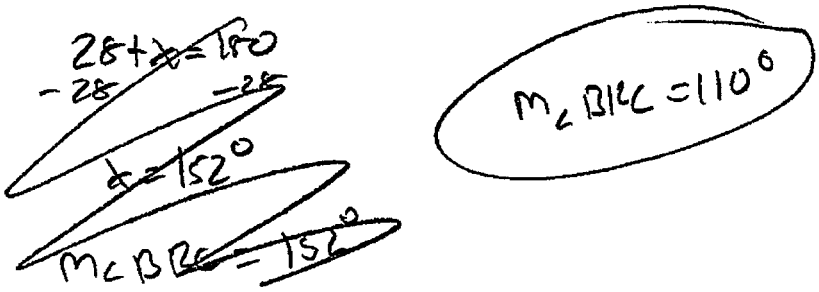
Score 2: The student had a complete and correct response. Angle measures for $\triangle CER$ were labeled on the diagram.

Question 34

34 In the diagram below, point B is the incenter of $\triangle FEC$, and $\overline{EBR}$, $\overline{CBD}$, and $\overline{FB}$ are drawn.



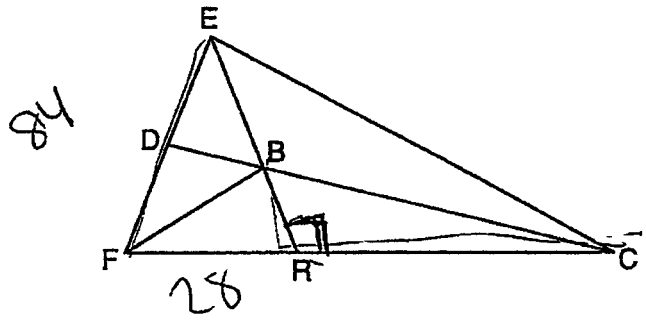
If m$\angle FEC$ = 84 and m$\angle ECF$ = 28, determine and state m$\angle BRC$.



Score 1: The student crossed out attempts to show work, but wrote the correct answer.

Question 34

34 In the diagram below, point B is the incenter of $\triangle FEC$, and $\overline{EBR}$, $\overline{CBD}$, and $\overline{FB}$ are drawn.



If m$\angle FEC = 84$ and m$\angle ECF = 28$, determine and state m$\angle BRC$.

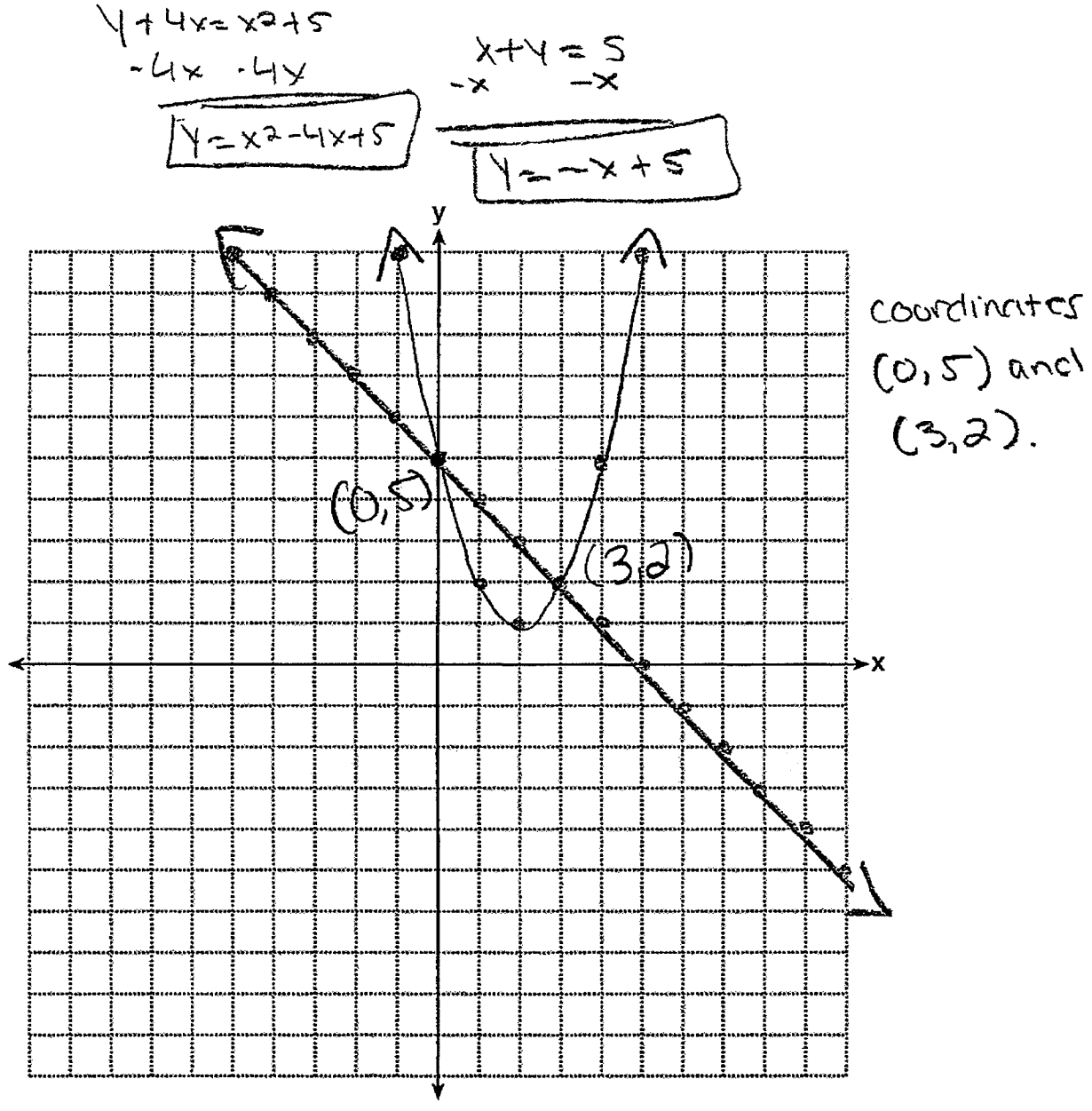
84+28=180
-112
68

Score 0: The student had a completely incorrect response.

Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$$y + 4x = x^2 + 5$$
$$x + y = 5$$



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

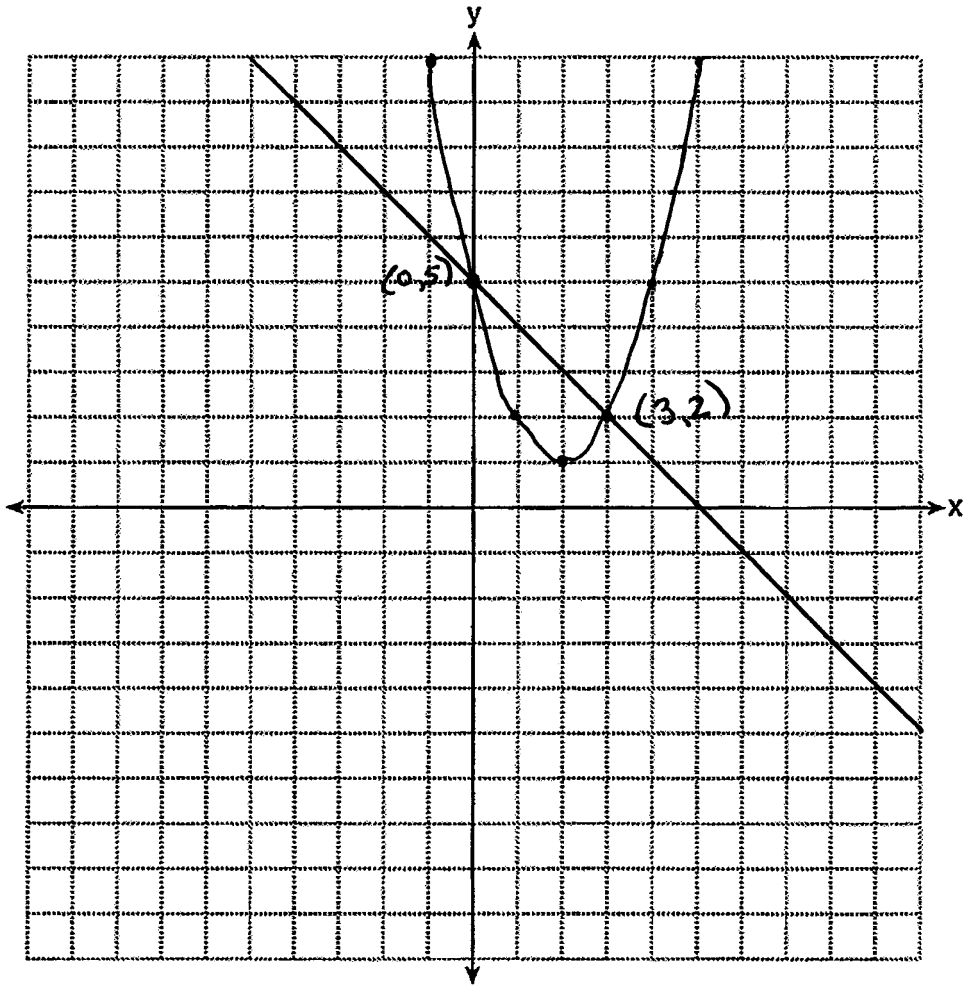
Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$$y + 4x = x^2 + 5$$
$$x + y = 5$$

$y = x^2 - 4x + 5$

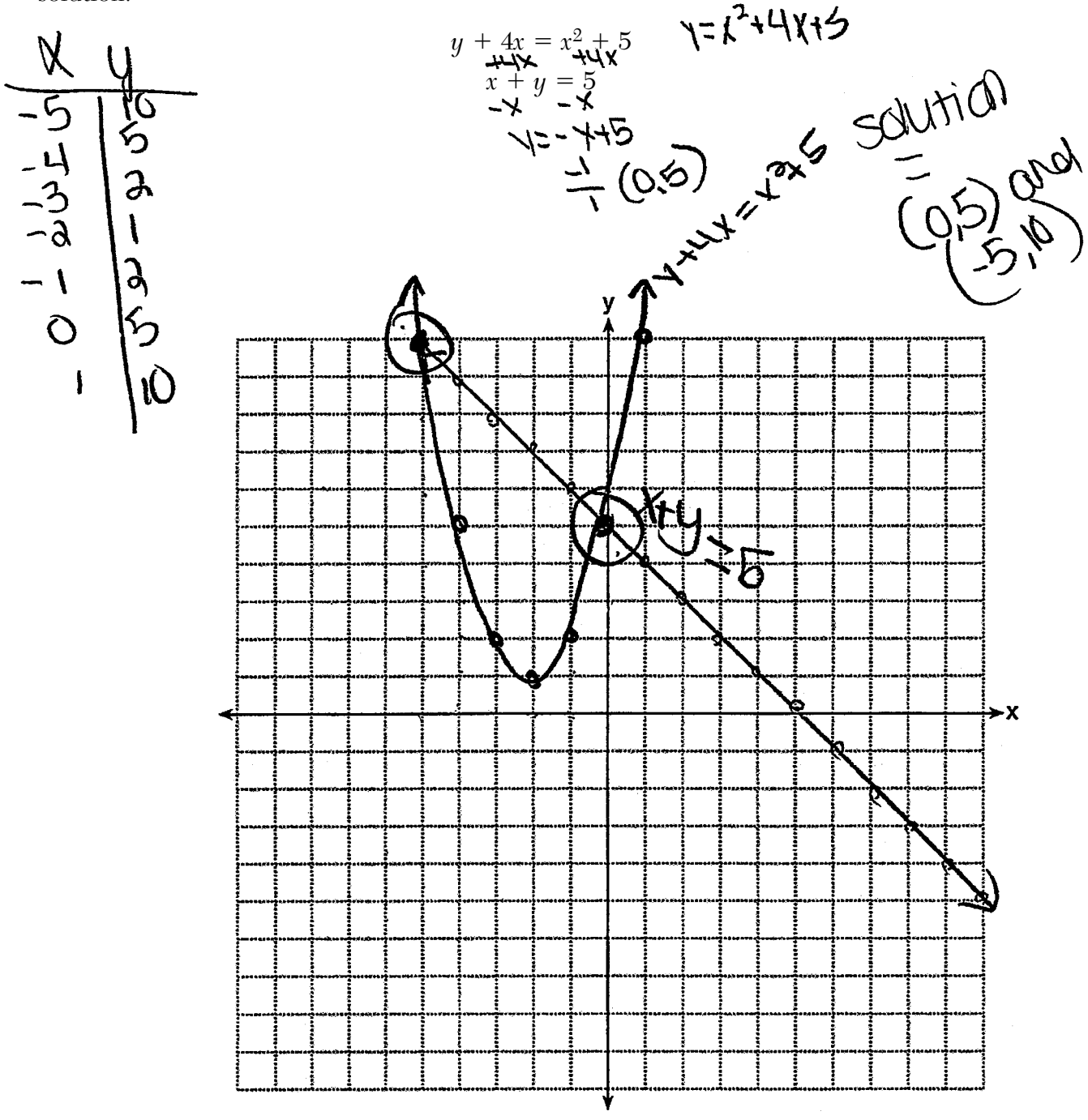
$y = -x + 5$



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

Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.



Score 3: The student made a computational error when solving the quadratic equation for y. An appropriate parabola was graphed and appropriate solutions were stated.

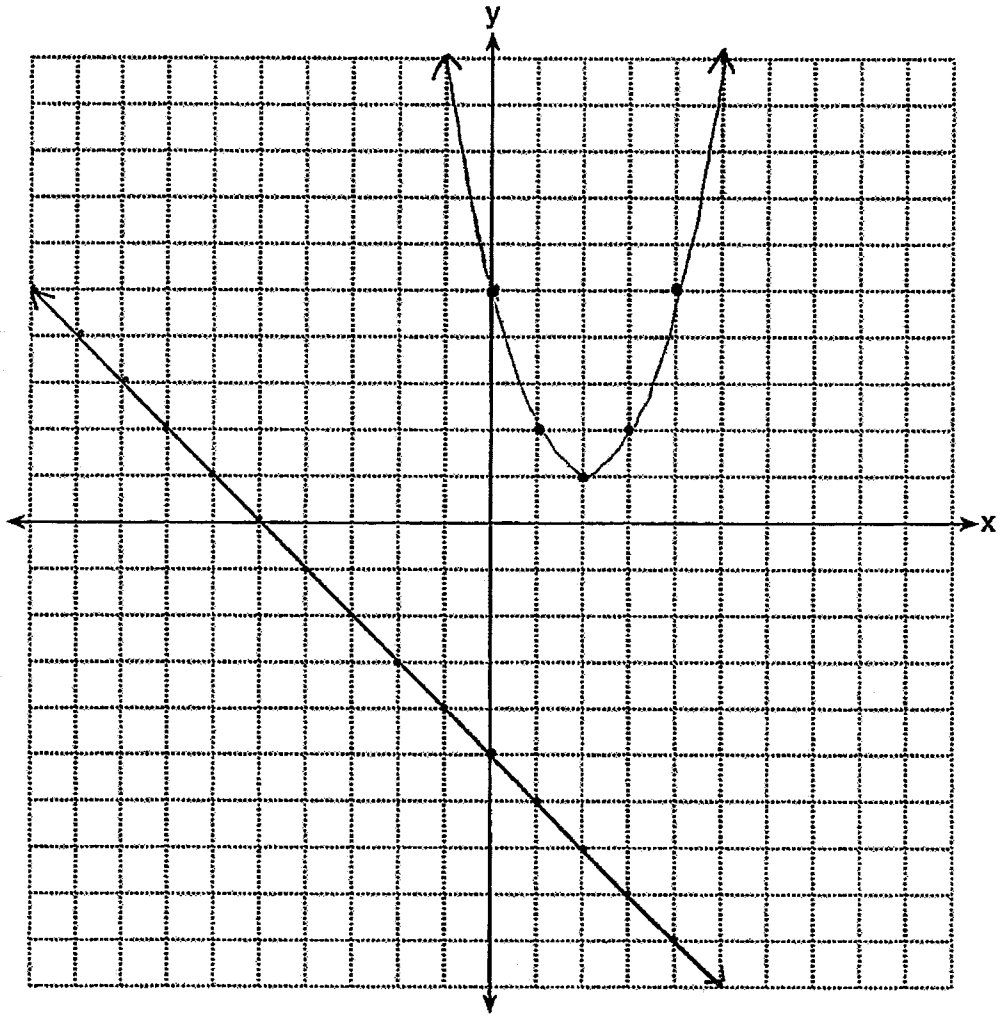
Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$$y + 4x = x^2 + 5$$
$$x + y = 5$$

$y+4x=x^2+5$
$y=x^2-4x+5$
$y=-x-5$

no common solutions



Score 3: The student made a computational error when solving the linear equation for y. An appropriate line was graphed and an appropriate solution was stated.

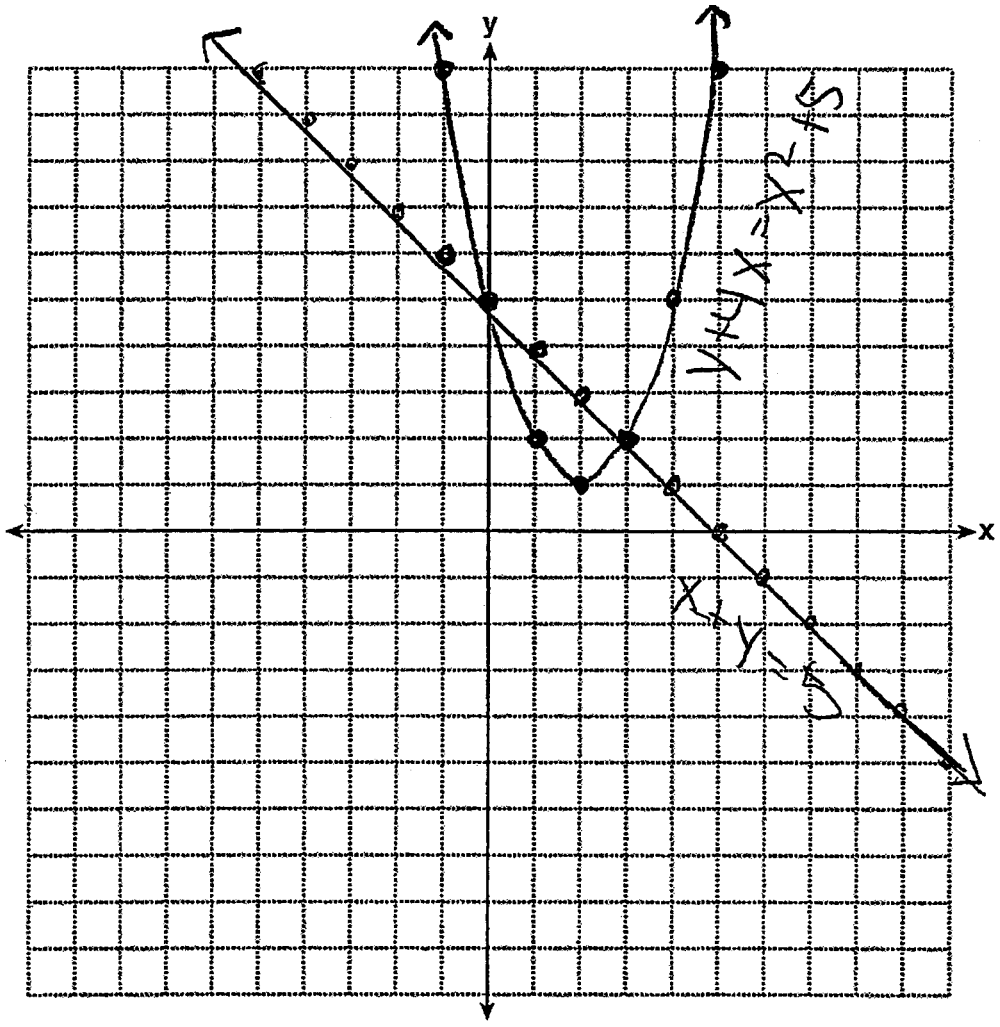
Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$$y + 4x = x^2 + 5$$
$$x + y = 5$$

$y + 4x = x^2 + 5$
$-4x \quad -4y$
$y = x^2 - 4x + 5$

$y = -x + 5$



Score 2: The student graphed both equations correctly, but no coordinates were stated.

Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$y + 4x = x^2 + 5$

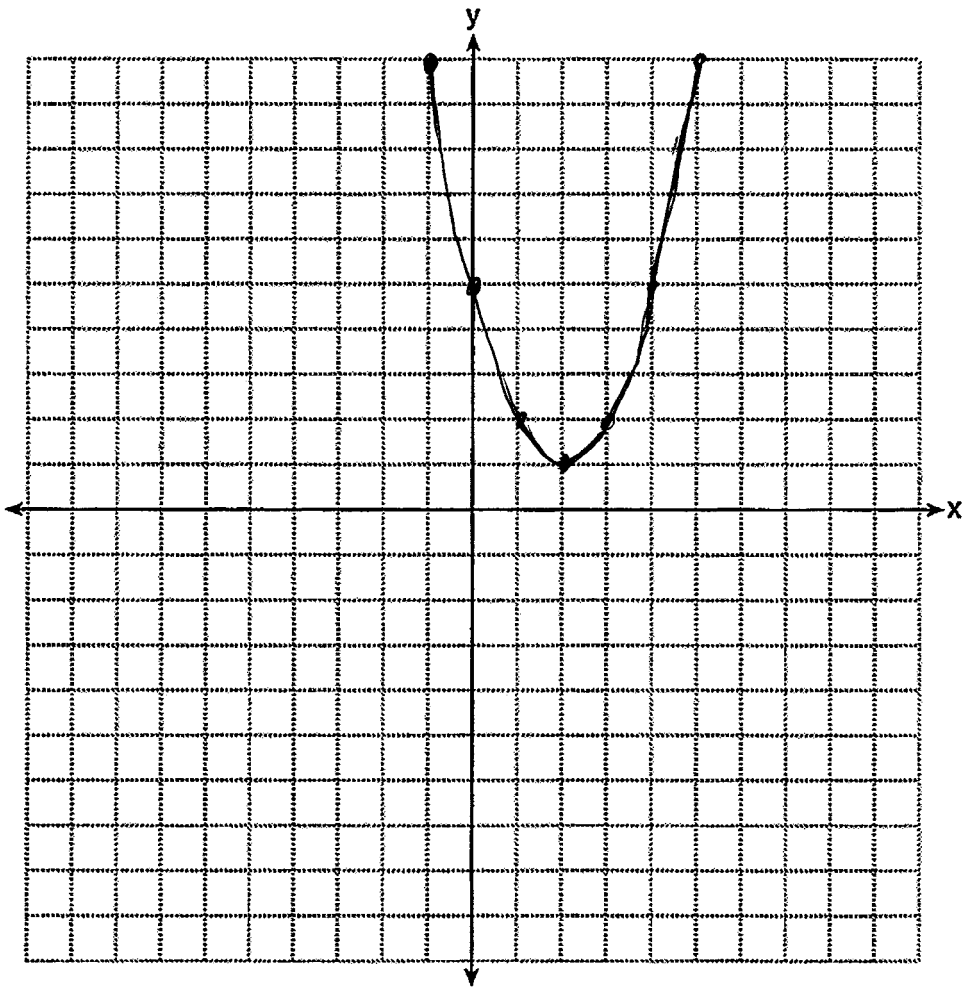
$x + y = 5$

$y = x^2 - 4x + 5$

$x = \frac{4}{2}$

$x = 2$

$y = 1$



Score 1: The student only graphed the parabola correctly.

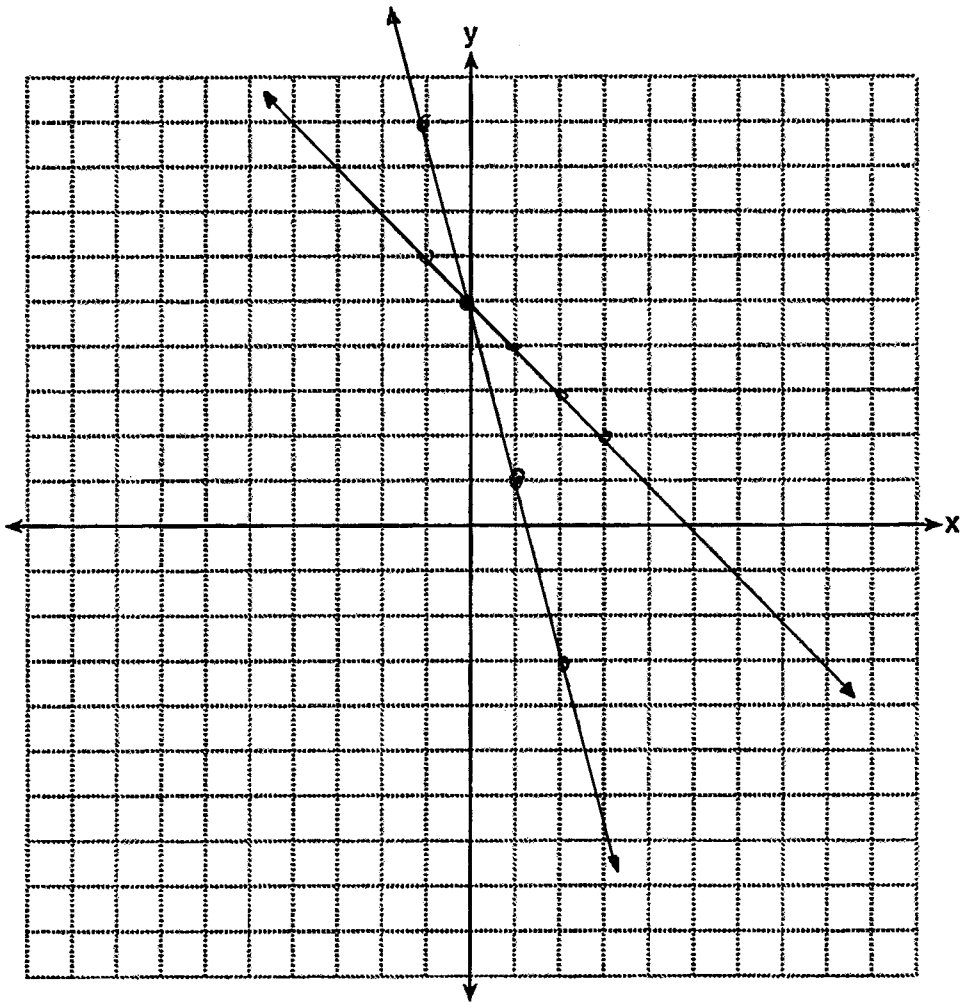
Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$$y + 4x = x^2 + 5$$
$$x + y = 5$$

$y+4x=x^2+5$
$-4x=-4x$

$y=-4x+5$ $\quad y=-x+5$

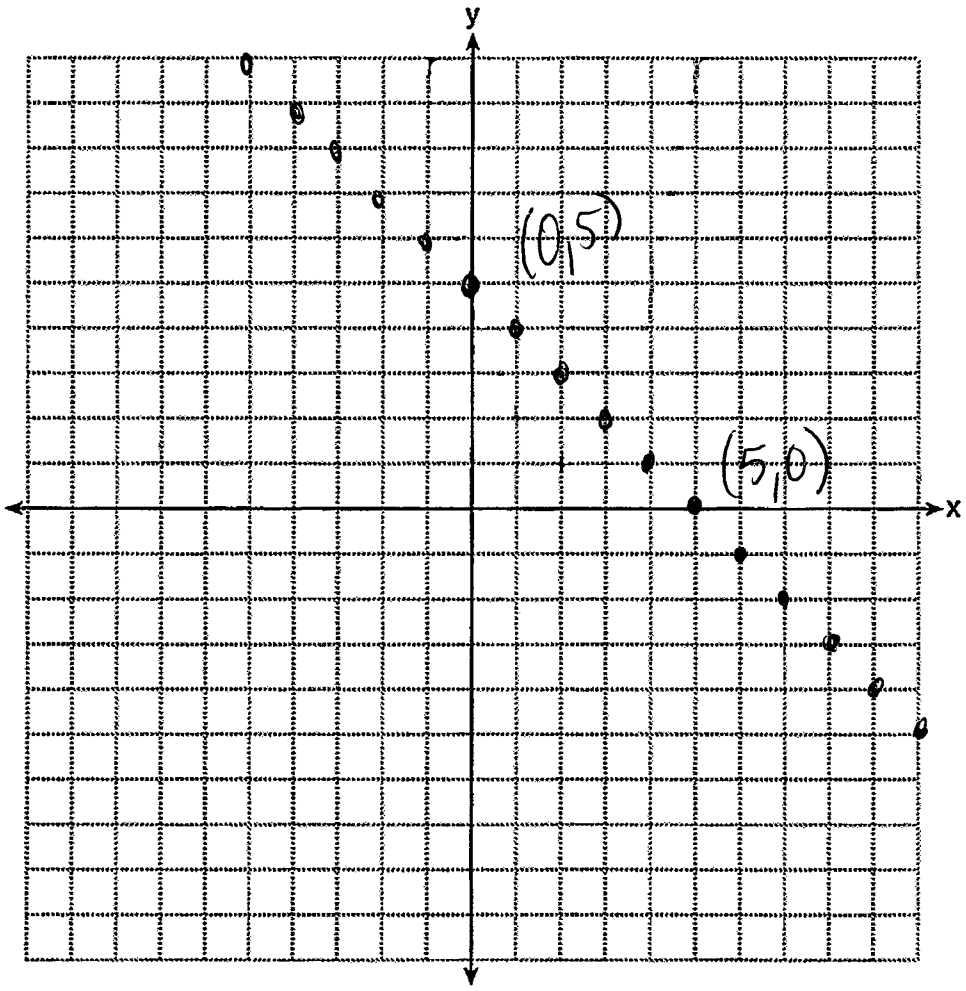


Score 1: The student made a conceptual error when solving the quadratic equation for y and did not state the solution of the system. The student graphed $x + y = 5$ correctly.

Question 35

35 Solve the following system of equations graphically. State the coordinates of all points in the solution.

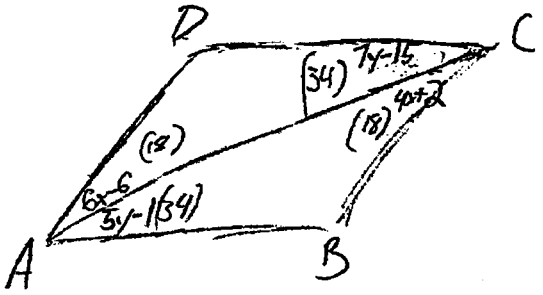
$$y + 4x = x^2 + 5$$
$$x + y = 5$$



Score 0: The student had a completely incorrect response.

Question 36

36 In parallelogram $ABCD$, with diagonal $\overline{AC}$ drawn, $m\angle BCA = 4x + 2$, $m\angle DAC = 6x - 6$, $m\angle BAC = 5y - 1$, and $m\angle DCA = 7y - 15$. Determine $m\angle B$.



$6x - 6 = 4x + 2$

$2x = 8$

$x = 4$

$7y - 15 = 5y - 1$

$\frac{2y}{2} = \frac{14}{2}$

$y = 7$

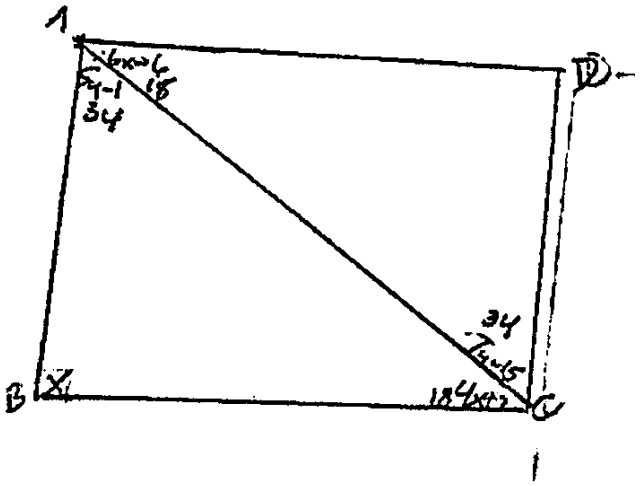
$180 - 18 - 34 = 128$

$m\angle B = 128°$

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

Question 36

36 In parallelogram $ABCD$, with diagonal $\overline{AC}$ drawn, $m\angle BCA = 4x + 2$, $m\angle DAC = 6x - 6$, $m\angle BAC = 5y - 1$, and $m\angle DCA = 7y - 15$. Determine $m\angle B$.



$6x - 6 = 4x + 2$
$-4x \quad -4x$
$2x - 6 = 2$
$+6 \quad +6$
$\frac{2x}{2} = \frac{8}{2}$
$x = 4$

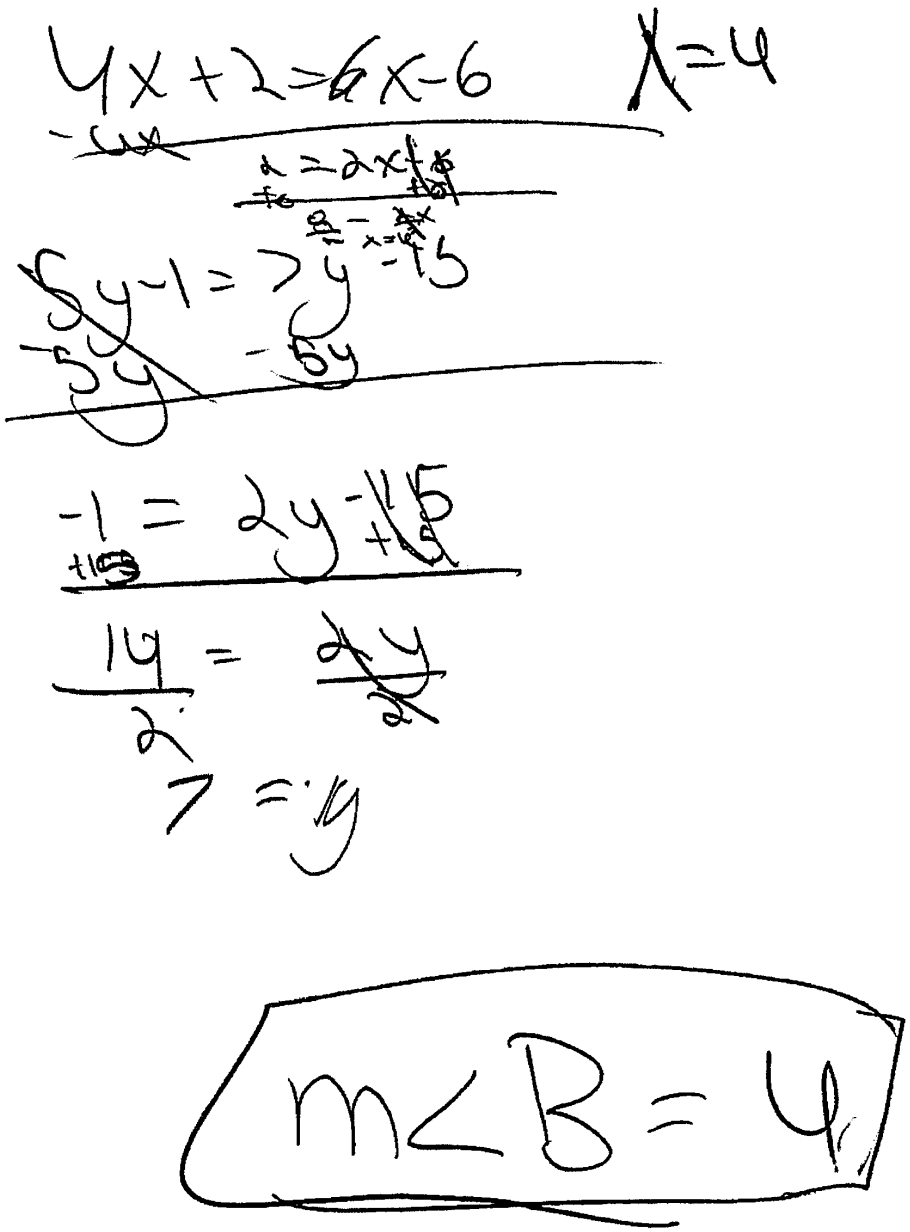
$5y - 1 = 2y - 15$
$-5y \quad -5y$
$-1 = 2y - 15$
$+15 \quad +15$
$\frac{14}{2} = \frac{2y}{2}$
$7 = y$

$\angle B = 90$

Score 3: The student showed appropriate work to find $x = 4$ and $y = 7$. The student correctly labeled $m\angle ACB$ and $m\angle CAB$ on the diagram. The student did not find an appropriate measure for $\angle B$.

Question 36

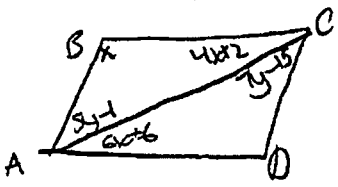
36 In parallelogram $ABCD$, with diagonal $\overline{AC}$ drawn, $m\angle BCA = 4x + 2$, $m\angle DAC = 6x - 6$, $m\angle BAC = 5y - 1$, and $m\angle DCA = 7y - 15$. Determine $m\angle B$.



Score 2: The student showed appropriate work to find $x = 4$ and $y = 7$, but no further correct work was shown.

Question 36

36 In parallelogram $ABCD$, with diagonal $\overline{AC}$ drawn, $m\angle BCA = 4x + 2$, $m\angle DAC = 6x - 6$, $m\angle BAC = 5y - 1$, and $m\angle DCA = 7y - 15$. Determine $m\angle B$.



Opp ∠ ≅

$5y - 1 = 7y - 15$

$-5y \quad -5y$

$-1 = 2y - 15$

$+15 \quad +15$

$14 = 2y$

$\frac{14}{2} = \frac{2y}{2}$

$y = 7$

$4x + 2 = 6x + 6$

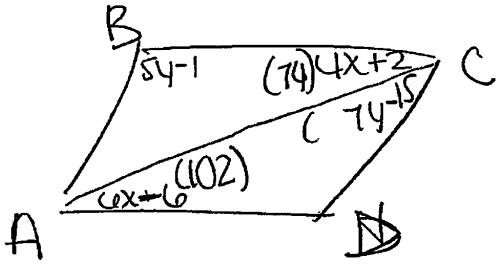
$-4 \quad -4x$

$2 = 2x + 6$

Score 1: The student showed appropriate work to find $y = 7$.

Question 36

36 In parallelogram $ABCD$, with diagonal $\overline{AC}$ drawn, $m\angle BCA = 4x + 2$, $m\angle DAC = 6x - 6$, $m\angle BAC = 5y - 1$, and $m\angle DCA = 7y - 15$. Determine $m\angle B$.



$5y-1+74-15=180$

$12y-16=180$

$+16 \quad +16$

$\frac{12y}{12} = \frac{196}{12}$

y

$5y-1+74-15=180$

$12y-16=180$

$+16 \quad +16$

$\frac{12y}{12} = \frac{196}{12}$

$6(18)-6$

$108-6$

102

$4(18)+2$

$72+7$

74

$6x-6+4x+2=180$

$10x-4=180$

$+4 \quad +4$

$\frac{10x}{10} = \frac{180}{10}$

$x=18$

$74-15+5y-1=180$

$12y-16=180$

$+16 \quad +16$

$\frac{12y}{12} = \frac{196}{12}$

$y=16.3$

$5(16.3)-15$

$81.5-15$

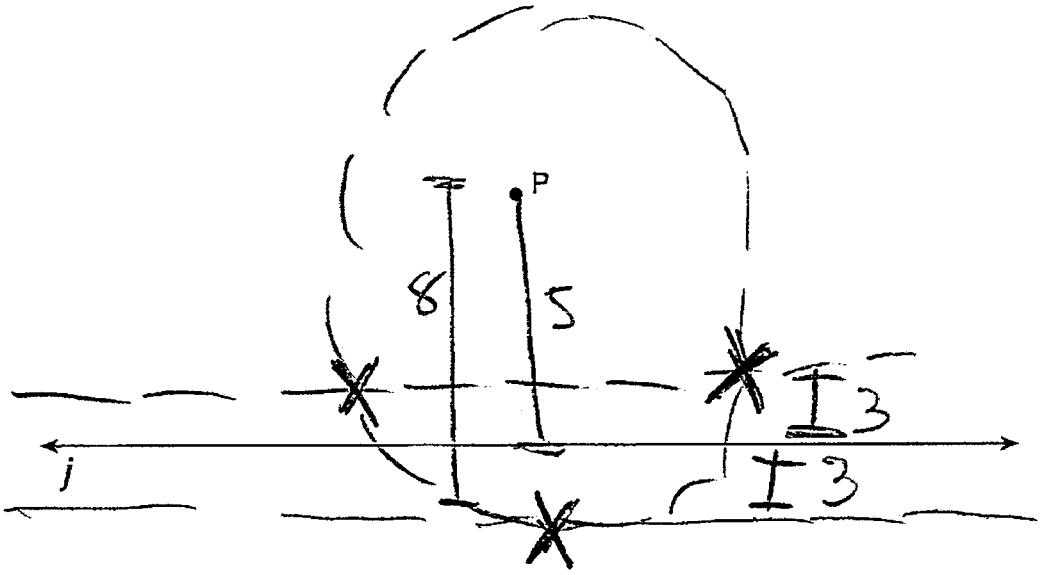
66.5

$m\angle B=66.5$

Score 0: The student had a completely incorrect response.

Question 37

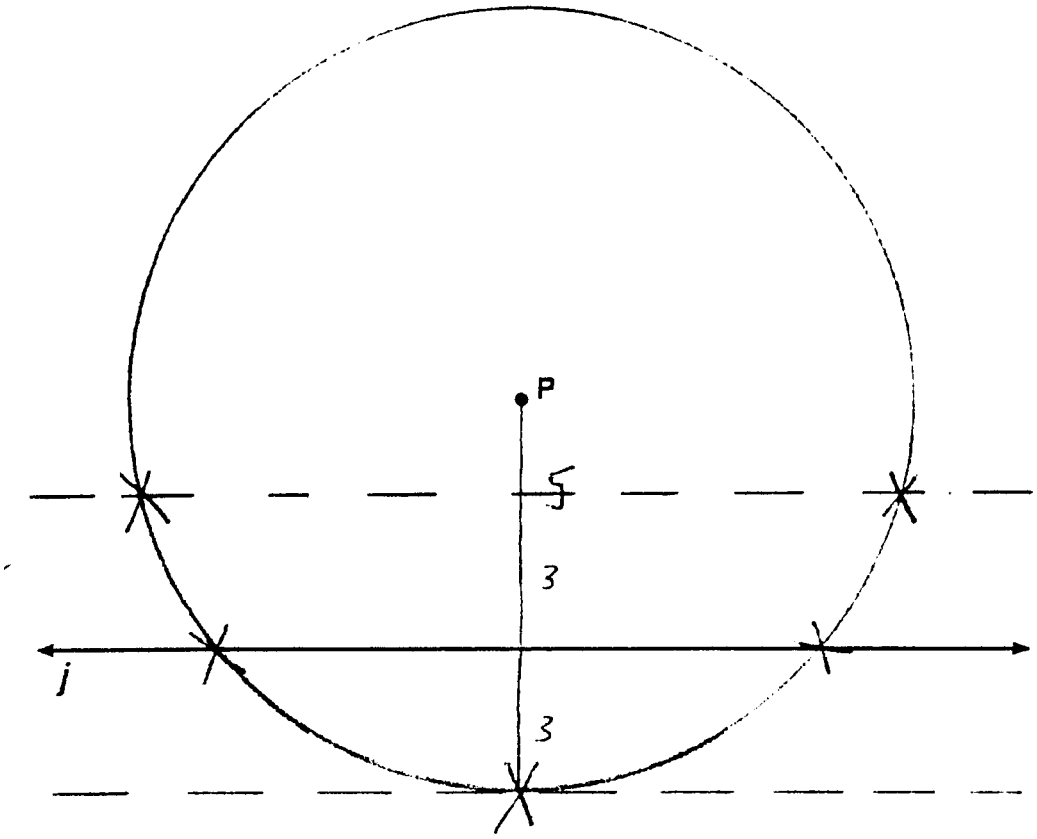
37 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.



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

Question 37

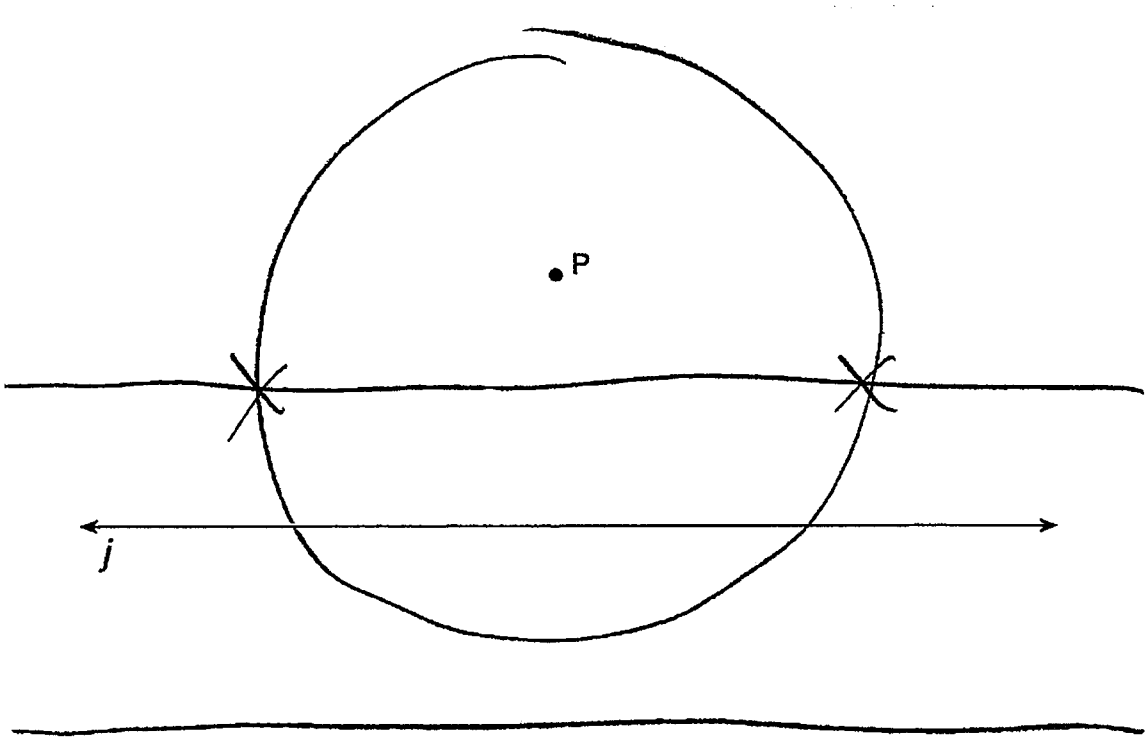
37 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.



Score 3: The student sketched both loci correctly, but labeled additional **X**s on line j.

Question 37

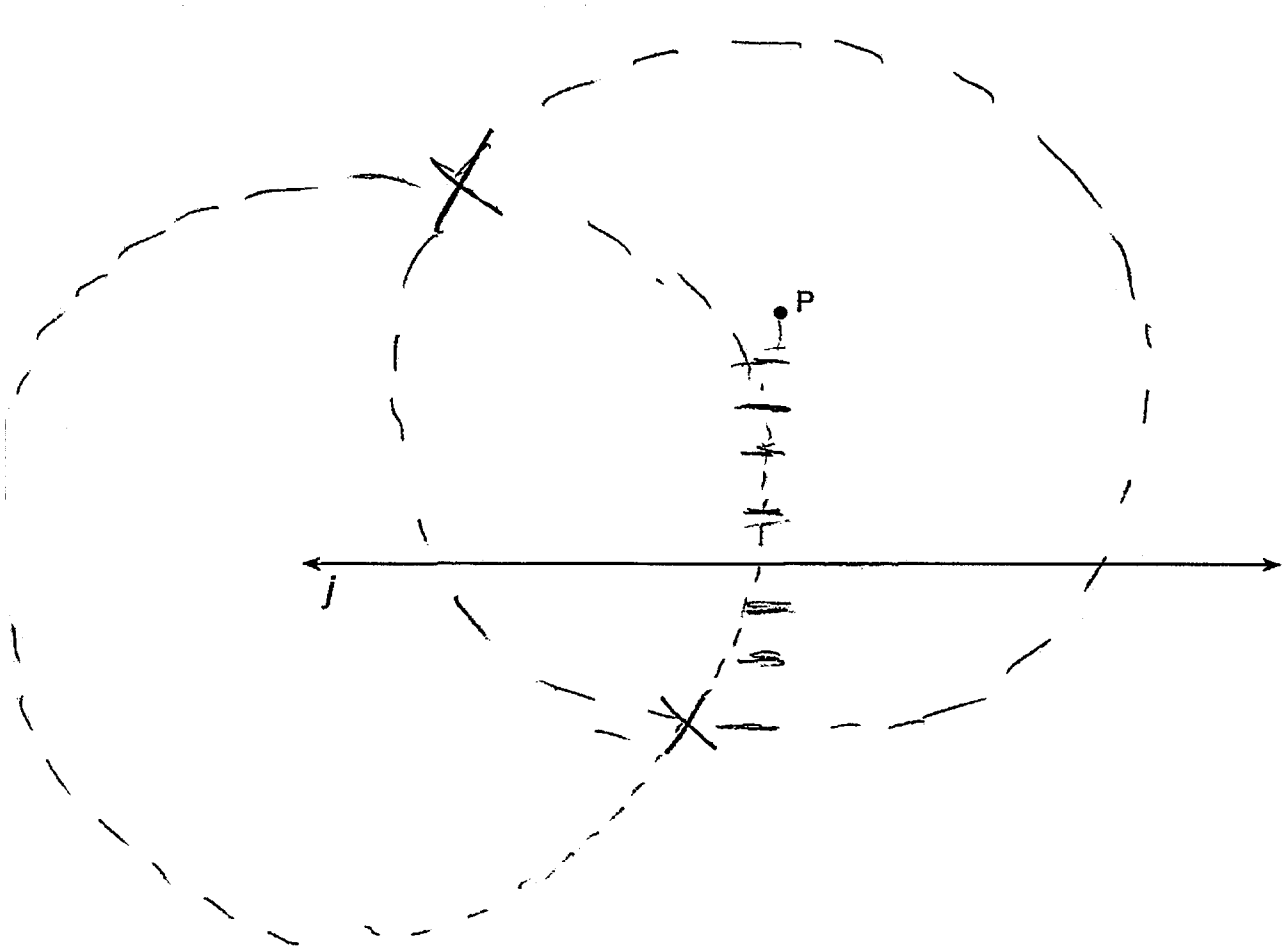
37 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.



Score 3: The student made a sketching error on the second locus, but appropriate points were labeled with an **X**.

Question 37

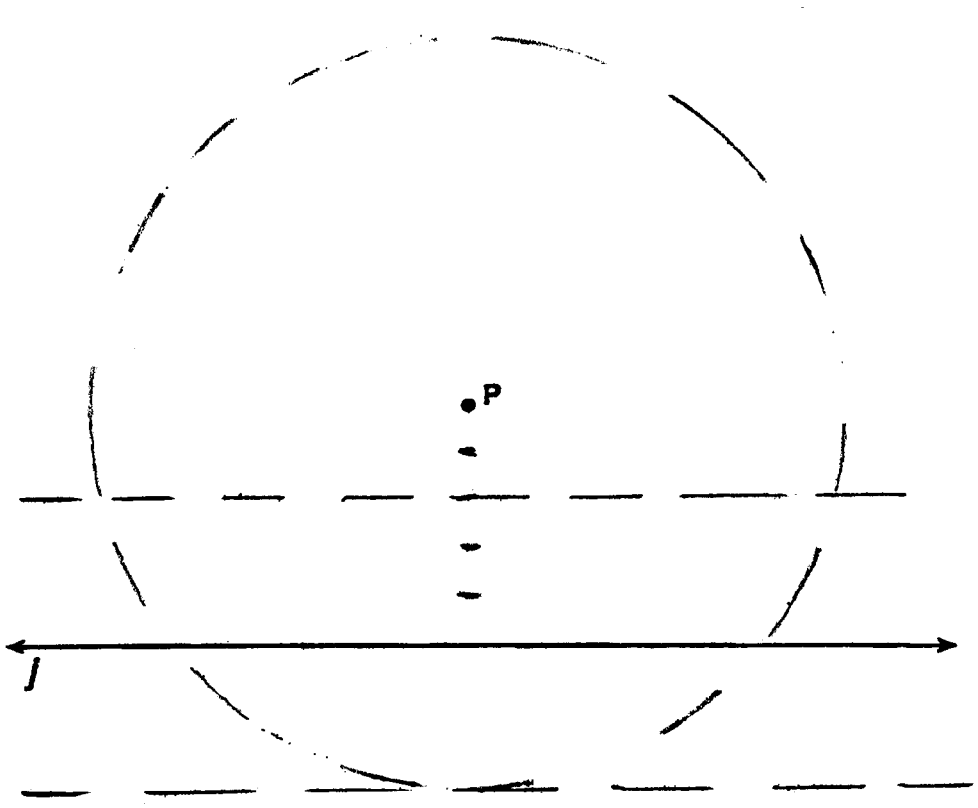
37 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.



Score 2: The student sketched both loci, but made a conceptual error in sketching the first locus. Appropriate points of intersection were labeled with an **X**.

Question 37

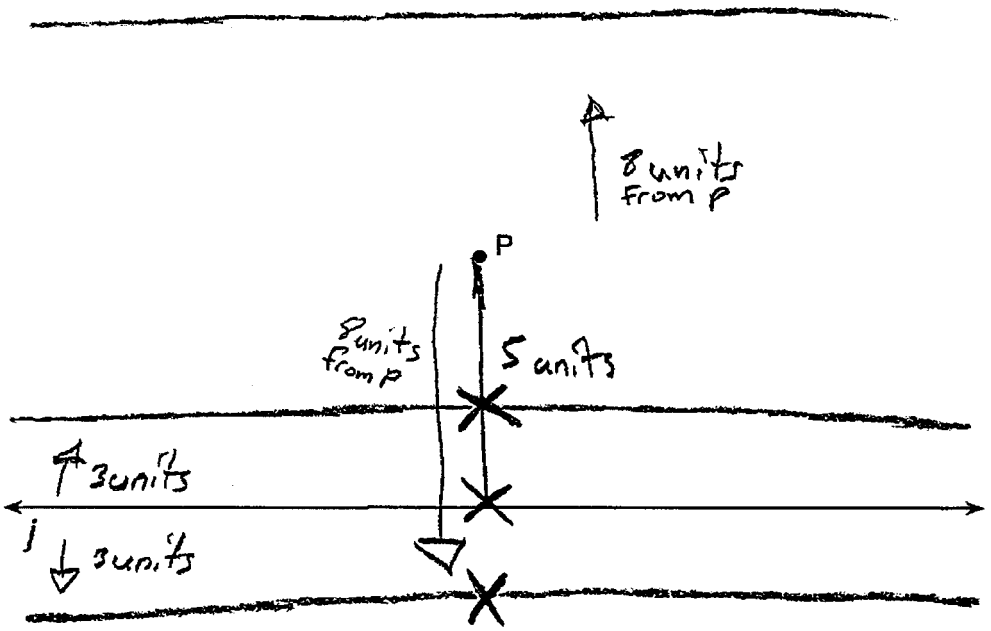
37 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.



Score 2: The student sketched both loci correctly, but no points of intersection were labeled.

Question 37

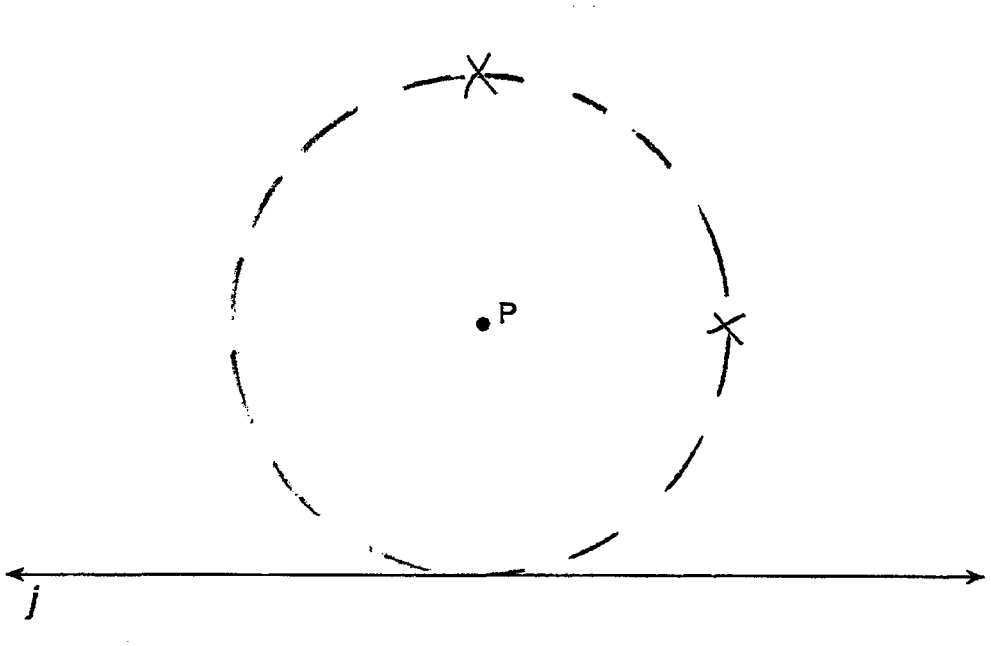
37 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.



Score 1: The student sketched one locus correctly, but no further correct work was shown.

Question 37

37 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.

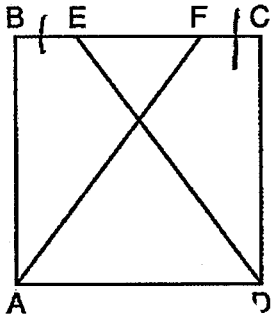


Score 0: The student had a completely incorrect response.

Question 38

38 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn.

Prove that $\overline{AF} \cong \overline{DE}$.



given Pro

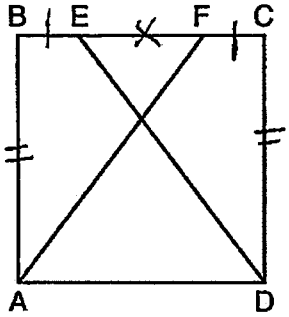
① ABCD is a square and $\overline{BE} \cong \overline{FC}$	① given
② $\overline{EF} \cong \overline{EF}$	② reflexive
③ $\overline{BF} = \overline{BE} + \overline{EF}$ $\overline{CE} = \overline{CF} + \overline{EF}$	③ Partition
④ $\overline{BF} \cong \overline{CE}$	④ equals plus equals are equal
⑤ $\overline{BA} \cong \overline{CD}$	⑤ all sides in a square are congruent
⑥ $\angle ABF \cong \angle ECD$	⑥ squares are equiangular
⑦ $\triangle ABF \cong \triangle DCE$	⑦ SAS
⑧ $\overline{AF} \cong \overline{DE}$	⑧ CPCTC

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

Question 38

38 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn.

Prove that $\overline{AF} \cong \overline{DE}$.



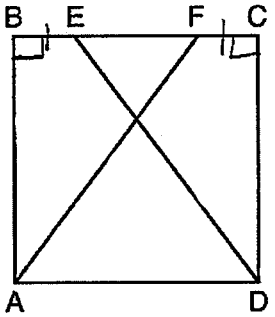
(1) $\overline{BE} \cong \overline{FC}$, square $ABCD$	Given
(2) $\overline{AB} \cong \overline{CD}$	all sides of a square are $\cong$
(3) $\overline{EF} \cong \overline{EF}$	Reflexive Property
(4) $\overline{BE}+\overline{EF} \cong \overline{FC}+\overline{EF}$	addition postulate
(5) $\angle ABF \cong \angle DCB$	all $\angle$s in square are rt. $\angle$'s, rt. $\angle$s are $\cong$
(6) $\triangle ABF \cong \triangle DCE$	SAS $\cong$ SAS
(7) $\overline{AF} \cong \overline{DE}$	CPCTC

Score 5: The student did not prove $\overline{BF} \cong \overline{CE}$.

Question 38

38 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn.

Prove that $\overline{AF} \cong \overline{DE}$.



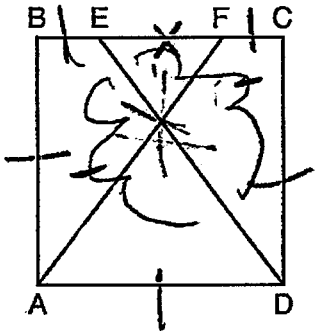
Statment	Reason
(1) $\overline{BE} \cong \overline{FC}$	(1) Given
(2) $\overline{EF} \cong \overline{EF}$	(2) Reflexive
(3) $\overline{BF} \cong \overline{CE}$	(3) Addition
(4) $\overline{BA} \cong \overline{CD}$	(4) All sides of a square are Congruent
(5) $\angle B, \angle C$ are right angles	(5) All angles of a square are right angles
(6) $\angle B \cong \angle C$	(6) All right angles are Congruent.
(7) $\overline{AF} \cong \overline{DE}$	(7) CPCTC

Score 4: The student did not write the complete given and missed one statement and its reason.

Question 38

38 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn.

Prove that $\overline{AF} \cong \overline{DE}$.



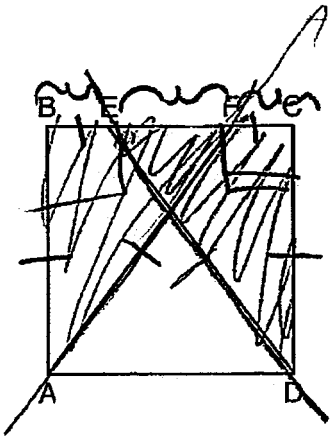
1) ABCD is a square, $\overline{BE} \cong \overline{FC}$	1) Given
2) $\overline{EF} \cong \overline{EF}$	2) Reflexive Postulate
3) $\overline{BE} + \overline{EF} \cong \overline{EF} + \overline{FC}$ $\therefore \overline{BF} \cong \overline{EC}$	3) Equales added to equales then the results are equale.
4) $\overline{BA} \cong \overline{BC} \cong \overline{CD} \cong \overline{AD}$	4) All sides of square are equale.
5) $\triangle ABF \cong \triangle DCE$	5) SSS
6) $\overline{AF} \cong \overline{DE}$	6) Corresponding parts of congruent triangles are congruent.

Score 3: The student made one conceptual error by using SSS to prove the triangles congruent.

Question 38

38 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn.

Prove that $\overline{AF} \cong \overline{DE}$.



Statements

1 $\overline{BE} \cong \overline{FC}$

2. $\angle B$ & $\angle C$ are rt $\angle$'s

3 $\angle B \cong \angle C$

4 $\overline{BE} + \overline{EF} \cong \overline{CF} + \overline{EF}$

5 $\overline{BA} \cong \overline{CD}$

4 $\triangle ABF \cong \triangle DEC$

5 $\overline{AF} \cong \overline{DE}$

Reasons

1 given

2 all squares sides meet to form rt $\angle$s,

3 all rt $\angle$'s are $\cong$

4 Addition Prostate

5 all sides of a $\square$ are $\cong$

4 SAS $\cong$ SAS

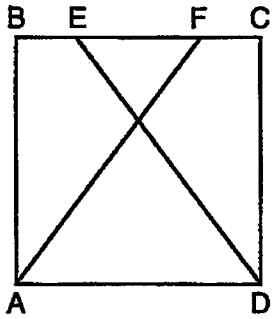
5 CPCTC.

Score 2: The student wrote some correct statements and reasons, but three or four statements and/or reasons were missing or were incorrect.

Question 38

38 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn.

Prove that $\overline{AF} \cong \overline{DE}$.



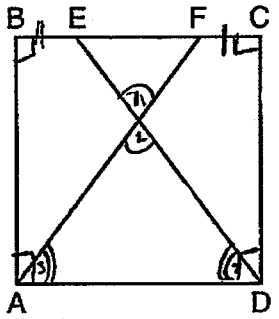
ABCD is a square with $\overline{BE} \cong \overline{FC}$ is given.
All sides of a square are equal so $\overline{BA} \cong \overline{CD}$.
$\triangle ABF \cong \triangle DCE$ by SSS so parts are equal.

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

Question 38

38 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn.

Prove that $\overline{AF} \cong \overline{DE}$.



Statements	Reasons
1. $\overline{BE} \cong \overline{FC}$	1. Given
2. $\angle 1 \cong \angle 2$	2. Vertical angles are congruent.
3. $\angle BAD$, $\angle CBA$, $\angle CDA$, and $\angle BCD$ form right angles.	3. Definition of a square
4. $\overline{ED}$ and $\overline{FA}$ bisect $\angle CDA$ and $\angle BAD$.	4. Definition of bisector
5. $\angle 3$ and $\angle 4$ are congruent.	5. Substitution
6. CPCTC	6. $\overline{AF} \cong \overline{DE}$

Score 0: The student wrote no correct statements.