The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Tuesday, August 19, 2025 — 8:30 to 11:30 a.m., only

MODEL RESPONSE SET

Table of Contents

25 Solve the equation $\frac{1}{6}(4x + 12) = 9$ algebraically.

$$\frac{4}{1} \cdot \frac{1}{6} = \frac{4}{6}$$

$$\frac{2}{3}x + 2 = 9$$
$$\quad -2 \quad -2$$

$$\frac{\frac{2}{3}x}{\frac{2}{3}} \overset{=}{\odot} \frac{7}{\frac{2}{3}}$$

$$x = \frac{21}{2}$$

$$\overset{k}{\frac{7}{1}} \div \overset{s}{\frac{2}{3}}$$

$$\frac{7}{1} \cdot \frac{3}{2} = \frac{21}{2}$$

__Check__

$$\frac{1}{6}\left(4\left(\frac{21}{2}\right) + 12\right) = 9$$
$$\frac{1}{6}\left(42 + 12\right) = 9$$
$$7 + 2 = 9$$
$$9 = 9 \checkmark$$

$$\boxed{x = \frac{21}{2}}$$

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

25 Solve the equation $\frac{1}{6}(4x + 12) = 9$ algebraically.

$$\frac{1}{6}(4x + 12) = 9$$

$$\frac{2}{3}x + 2 = 9$$
$$\underline{-2 \quad -2}$$

$$\frac{\frac{2}{3}x = 7}{\frac{2}{3} \qquad \frac{2}{3}}$$

$$\boxed{x = 10.5}$$

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

25 Solve the equation $\frac{1}{6}(4x + 12) = 9$ algebraically.

$$\frac{1}{6}(4x+12)=9$$

$$.7x + 2 = 9$$
$$\quad\quad -2\ -2$$
$$\frac{.7x}{.7} = \frac{7}{.7}$$
$$x = 10$$

Score 1: The student expressed $\frac{4}{6}$ as .7.

25 Solve the equation $\frac{1}{6}(4x + 12) = 9$ algebraically.

$$\frac{2}{3}x + 2 = 9$$
$$\phantom{\frac{2}{3}x} - 2 \quad -7$$

$$\frac{3}{2} \cdot \frac{2}{3}x = 7 \cdot \frac{3}{2}$$

$$x = 3$$

Score 1: The student made a transcription error.

25 Solve the equation $\frac{1}{6}(4x + 12) = 9$ algebraically.

$$X = 1$$

$$.7X + 7 = 9$$
$$-7 \quad -2$$
$$\frac{.7x = 7}{7} \quad 1$$

$$\boxed{1}$$

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

25 Solve the equation $\frac{1}{6}(4x + 12) = 9$ algebraically.

$$\frac{1}{6}(4x + 12) = 9$$

$$.6x + 12.16 = 9$$
$$\underline{-12.16 \qquad -12.16}$$

$$\frac{.6x}{.6} = \frac{-3.16}{.6}$$

$$\boxed{x = -5.26}$$

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

26 Is the sum of $3\sqrt{2}$ and 5 rational or irrational? Explain your answer.

The sum of $3\sqrt{2}$ and 5 is irrational.
It is irrational because $3\sqrt{2}$ is
irrational and adding irrationals
with 5, a rational, doesn't make it
rational, so, it is irrational.

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

26 Is the sum of $3\sqrt{2}$ and 5 rational or irrational? Explain your answer.

irrational

9.242640687...

Score 1: The student wrote the full display of the calculator, but the explanation is missing.

26 Is the sum of $3\sqrt{2}$ and 5 rational or irrational? Explain your answer.

Irrational because the root cannot be added with the variable.

Score 0: The student did not write a correct explanation.

26 Is the sum of $3\sqrt{2}$ and 5 rational or irrational? Explain your answer.
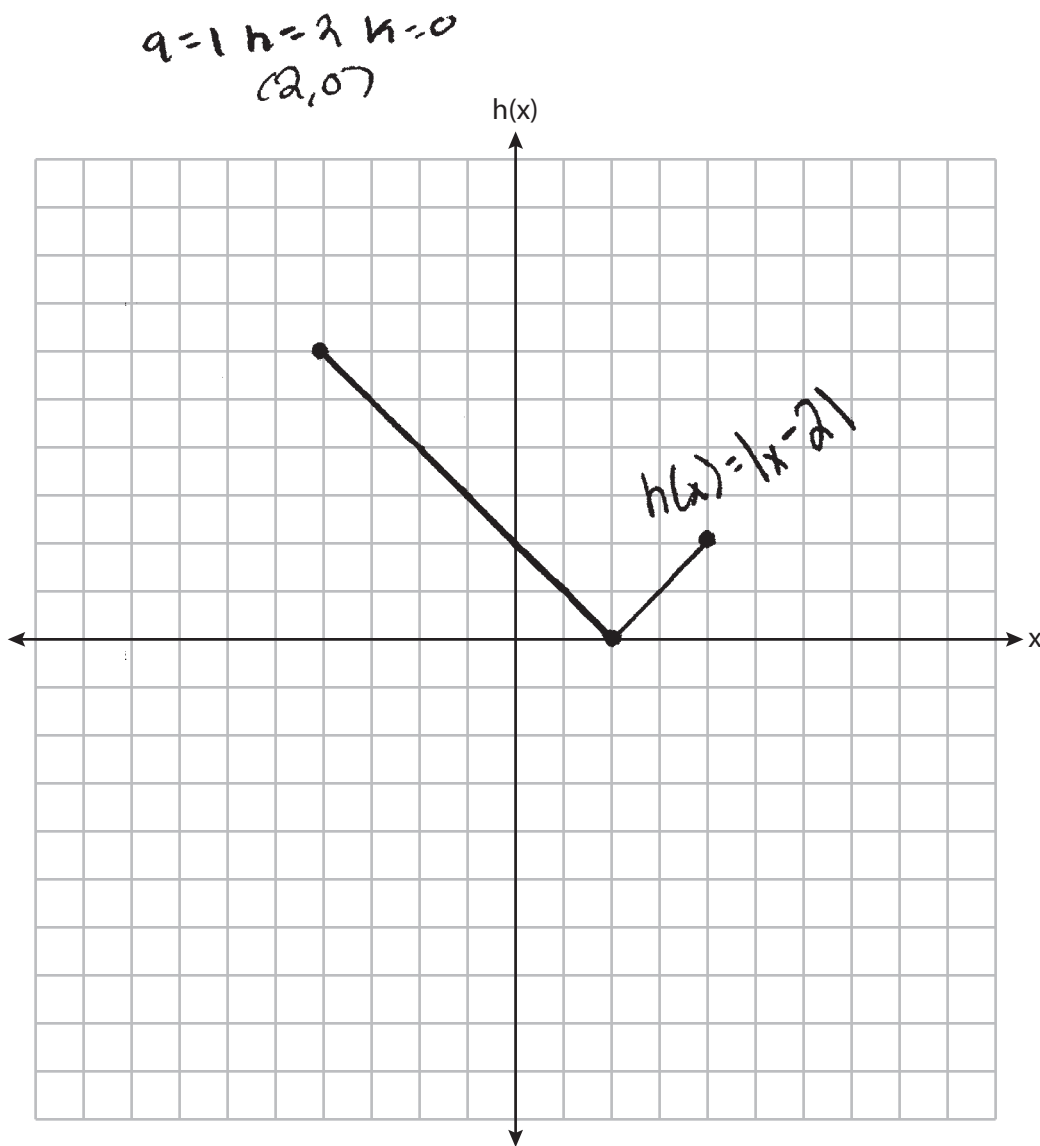
$$3\sqrt{2} \times 5 = 21.21320344$$

Irrational because the numbers after the decimal does not repeat

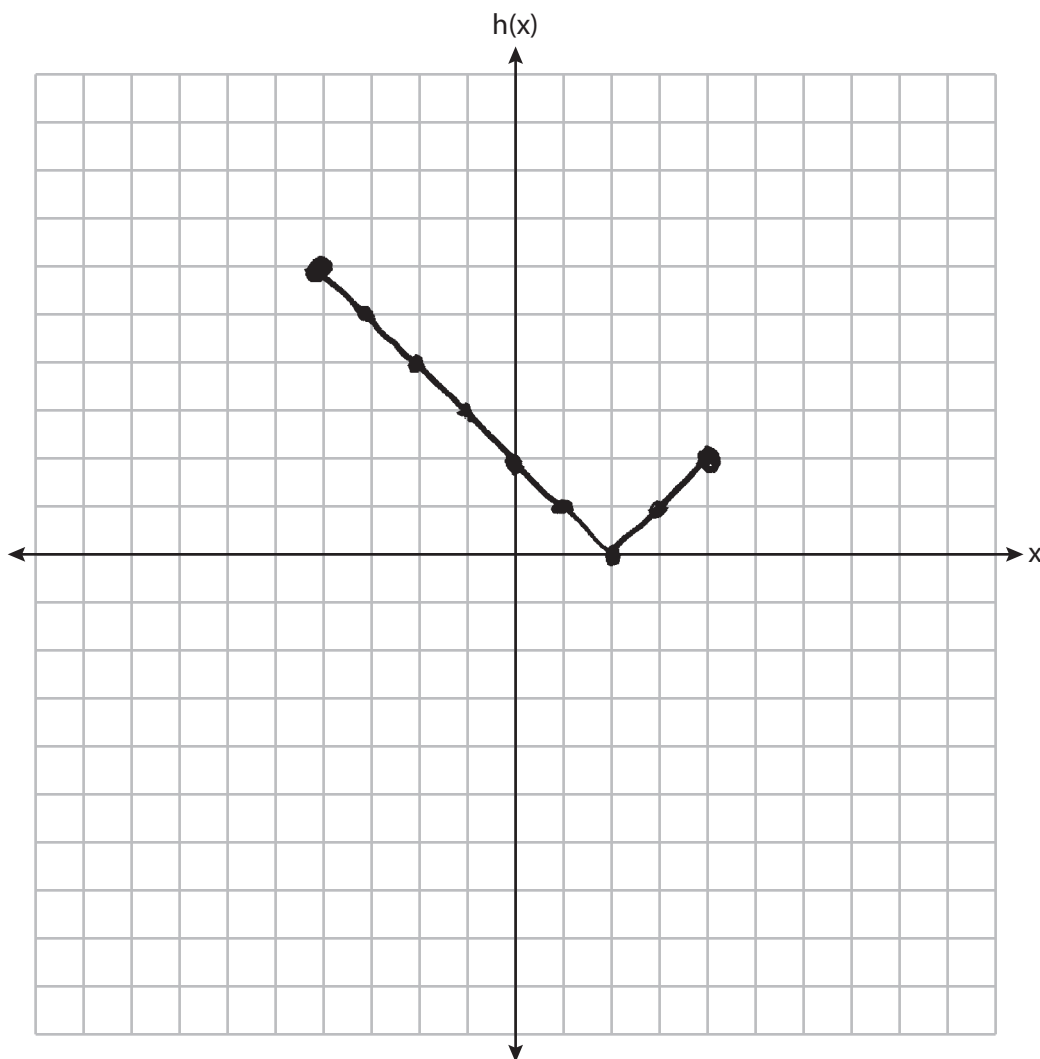**Score 0:** The student multiplied and wrote an incomplete explanation.

27 Graph $h(x) = |x - 2|$ over the domain $-4 \leq x \leq 4$.

$a = 1 \quad h = 2 \quad k = 0$

$(2, 0)$

h(x)

$h(x) = |x - 2|$

X

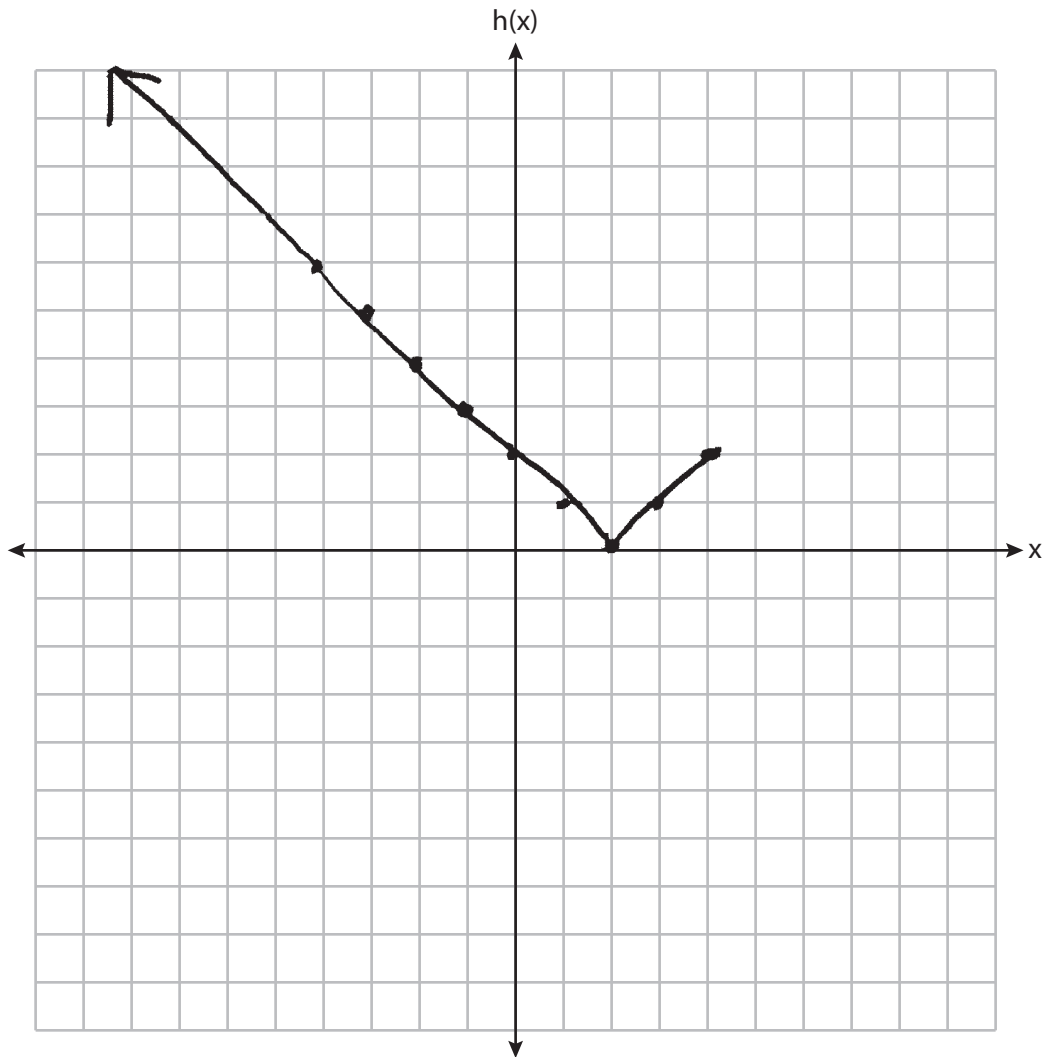**Score 2:** The student gave a complete and correct response.

27 Graph $h(x) = |x - 2|$ over the domain $-4 \leq x \leq 4$.

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

27 Graph $h(x) = |x - 2|$ over the domain $-4 \le x \le 4$.

Score 1: The student did not graph the function over the correct domain.

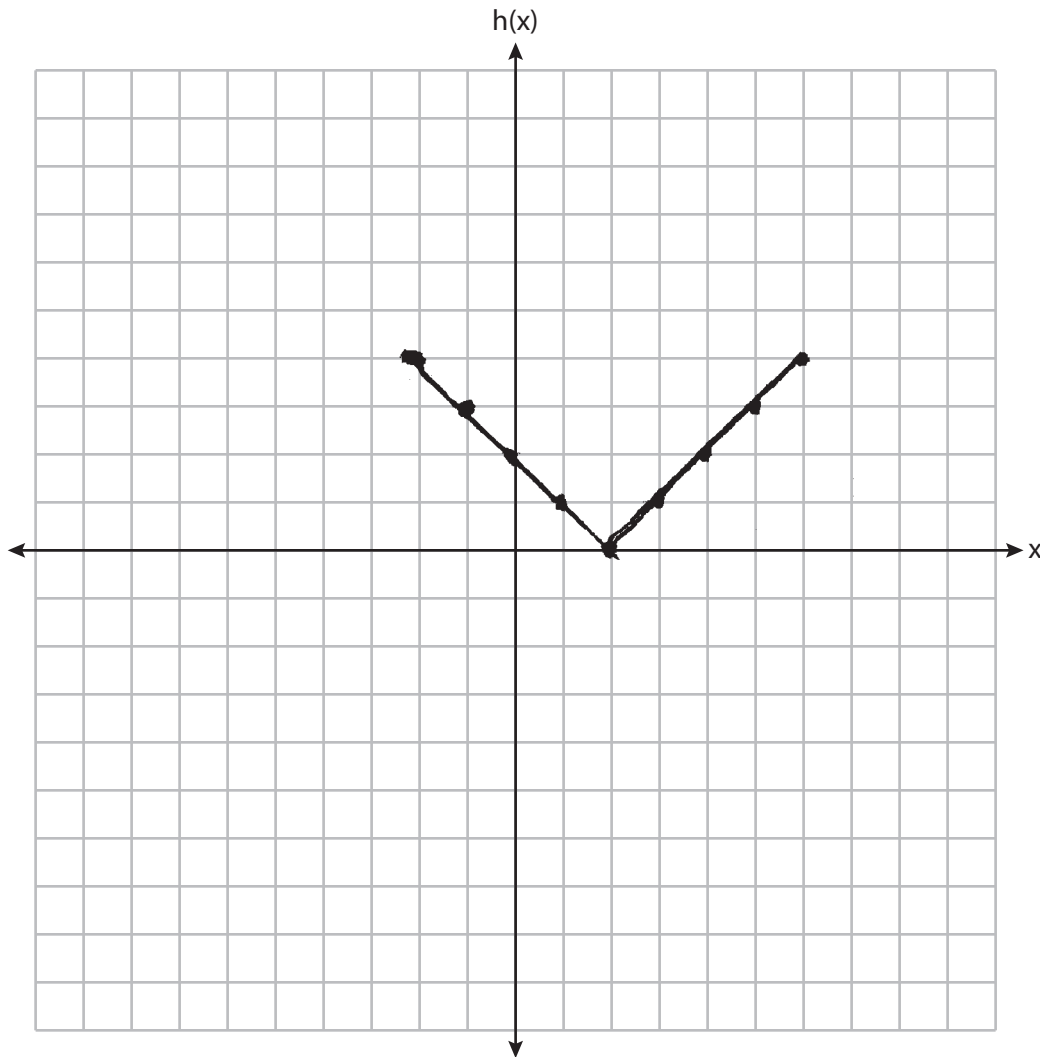**27** Graph $h(x) = |x - 2|$ over the domain $-4 \le x \le 4$.

Score 1: The student did not graph the function over the correct domain.

27 Graph $h(x) = |x - 2|$ over the domain $-4 \leq x \leq 4$.
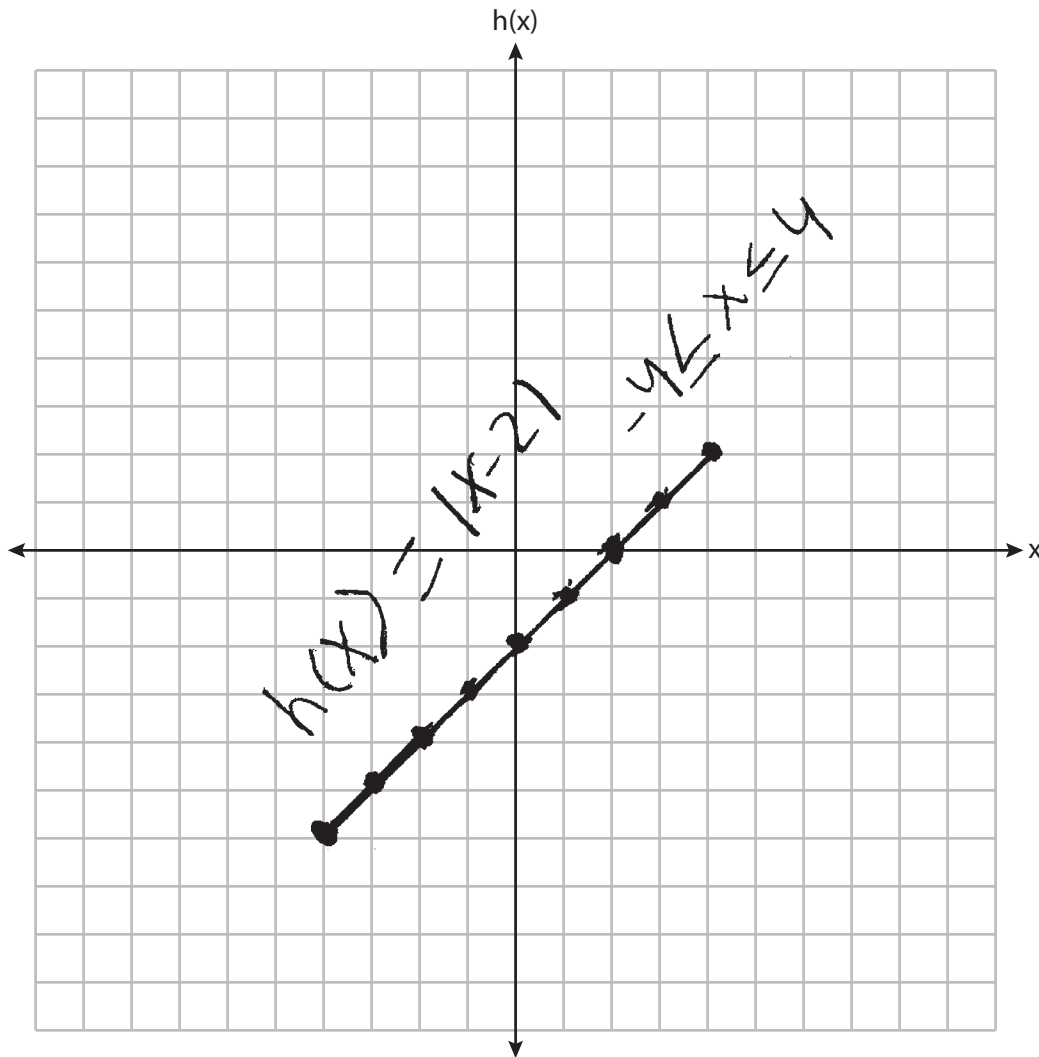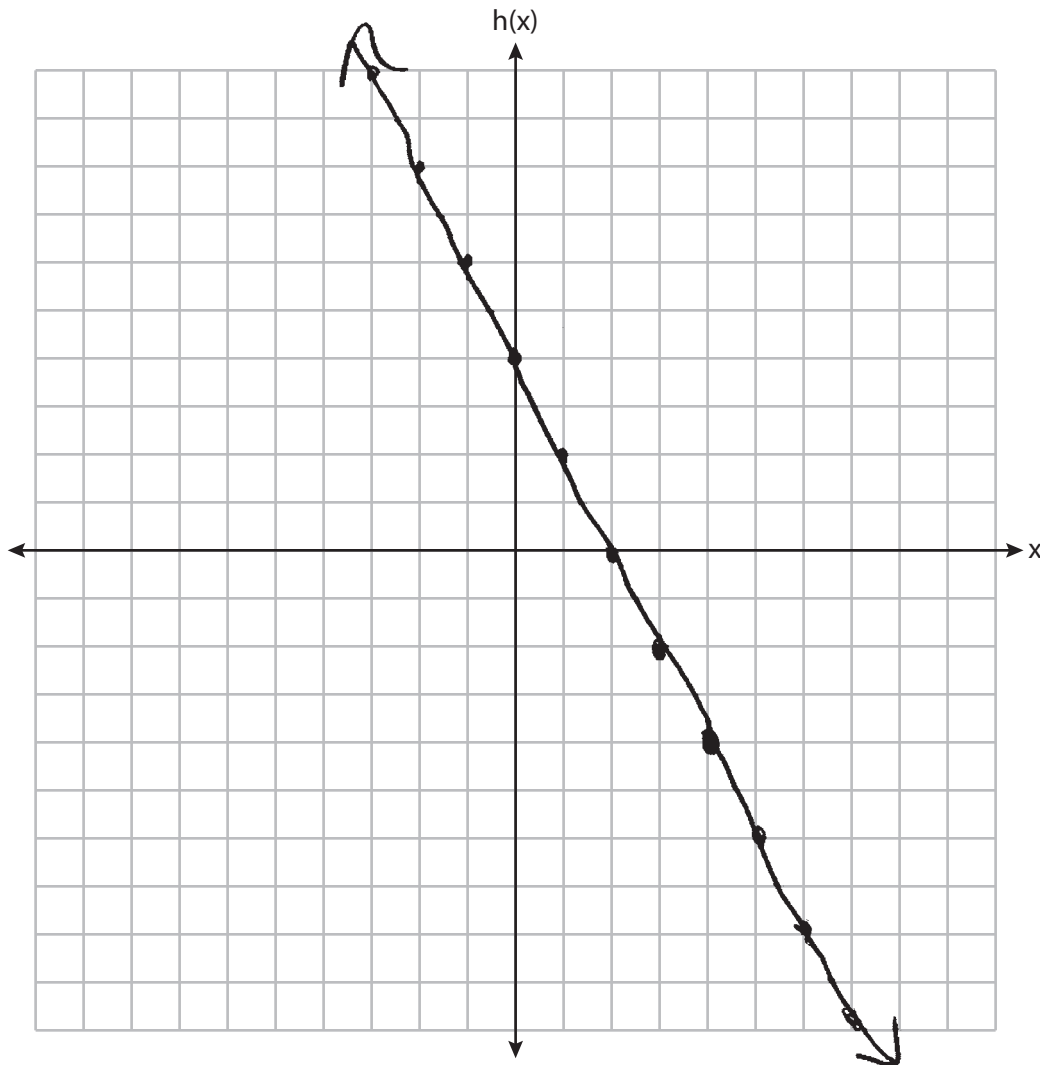

Score 1: The student graphed $h(x) = x - 2$ over the correct domain.

27 Graph $h(x) = |x - 2|$ over the domain $-4 \leq x \leq 4$.

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

28 A survey was given to 180 cell phone owners about the brand of phone they owned. The results showed that 59 adults owned Brand *B* and 32 teenagers owned Brand *A*. Of all the people surveyed, 40% owned Brand *A*. Complete the two-way frequency table below.

	Brand A	Brand B	Total
Adults	40	59	99
Teenagers	32	49	81
Total	72	108	180

$$40$$
$$72 - 32$$
$$180 \cdot \left(\frac{4}{10}\right) = 72$$

Brand A has 72 total

$$40 + 59 = 99$$
$$32 + 49 = 81 \qquad 99 + 81 = 180$$
$$180 - 72 = \boxed{108}$$

Brand B

$$108 - 59 = 49$$

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

28 A survey was given to 180 cell phone owners about the brand of phone they owned. The results showed that 59 adults owned Brand *B* and 32 teenagers owned Brand *A*. Of all the people surveyed, 40% owned Brand *A*. Complete the two-way frequency table below.

	Brand A	Brand B	Total
Adults	40	59	99
Teenagers	32	49	81
Total	72	108	180

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

28 A survey was given to 180 cell phone owners about the brand of phone they owned. The results showed that 59 adults owned Brand *B* and 32 teenagers owned Brand *A*. Of all the people surveyed, 40% owned Brand *A*. Complete the two-way frequency table below.

	Brand A	Brand B	Total
Adults	40	59	99
Teenagers	32	60	92
Total	72	109	811

$$100 - 40 = 60$$

Score 1: The student correctly found 72.

28 A survey was given to 180 cell phone owners about the brand of phone they owned. The results showed that 59 adults owned Brand *B* and 32 teenagers owned Brand *A*. Of all the people surveyed, 40% owned Brand *A*. Complete the two-way frequency table below.

	Brand A	**Brand B**	**Total**
Adults	40	59	99
Teenagers	32	59	81
Total	72	118	180

Score 1: The student made one computational error when subtracting 72 from 180.

28 A survey was given to 180 cell phone owners about the brand of phone they owned. The results showed that 59 adults owned Brand *B* and 32 teenagers owned Brand *A*. Of all the people surveyed, 40% owned Brand *A*. Complete the two-way frequency table below.

	Brand A	Brand B	Total
Adults		59	
Teenagers	32		
Total	40%		

180

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

29 Determine the 8th term of a geometric sequence whose first term is 5 and whose common ratio is 3.

$$a_n = 5(3)^{n-1}$$

$$a_8 = 5(3)^{8-1}$$

$$\boxed{a_8 = 10{,}935}$$

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

29 Determine the 8th term of a geometric sequence whose first term is 5 and whose common ratio is 3.

$$5, 15, 45, 135, 405, 1215, 3645, 10935, \ldots$$

$5 \times 3 = 15$

$15 \times 3 = 45$

$45 \times 3 = 135$

$135 \times 3 = 405$

$405 \times 3 = 1215$

$1215 \times 3 = 3645$

$3645 \times 3 = 10935$

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

29 Determine the 8th term of a geometric sequence whose first term is 5 and whose common ratio is 3.

$$\cdot 3$$

$$a_1 = 5$$

$$a_2 = 15$$

$$a_3 = 45$$

$$a_4 = 135$$

$$a_5 = 405$$

$$a_6 = 1215$$

$$a_7 = 3645$$

$$a_8 = 10935$$

8th term is 10935

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

29 Determine the 8th term of a geometric sequence whose first term is 5 and whose common ratio is 3.

$A_1 : 5$

$A_2 : 5+3 = 8$

$A_3 : 8+3 = 11$

$A_4 : 11+3 = 14$

$A_5 : 14+3 = 17$

$A_6 : 17+3 = 20$

$A_7 : 20+3 = 23$

$A_8 : 23+3 = 26$

The 8th term is 26

Score 1: The student used an arithmetic sequence.

29 Determine the 8th term of a geometric sequence whose first term is 5 and whose common ratio is 3.

$$a_1 = 5$$

$$a_2 = 5(5) = 25$$

$$a_3 = 25(5) = 125$$

$$a_4 = 125(5) = 625$$

$$a_5 = 625(5) = 3125$$

$$a_6 = 3125(5) = 15625$$

$$a_7 = 15625(5) = 78125$$

$$a_8 = 78125(5) = \boxed{390625}$$

$$\boxed{a_8 = 390,625}$$

Score 1: The student used a common ratio of 5.

29 Determine the 8th term of a geometric sequence whose first term is 5 and whose common ratio is 3.

$$y = 5x + 3$$

$$y = 5(8) + 3 = 43$$

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

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$X^2 + 14x - 28 = 0$$
$$\quad\quad +28 \quad +28$$

$$X^2 + 14x = 28 \quad\quad \left(\tfrac{14}{2}\right)^2 = (7)^2 = 49$$
$$X^2 + 14x + 49 = 28 + 49$$
$$X + 14x + 49 = 77$$
$$(x+7)(x+7) = 77$$
$$(x+7)^2 = 77$$

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

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$X^2 + 14X - 28 = 0$$

$$(X+7)^2 - 49 - 28 = 0$$

$$(X+7)^2 - 77 = 0$$
$$ +77 \quad +77$$

$$(X+7)^2 = 77$$

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

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$x^2 + 14x - 28 = 0$$

$$7 \qquad +77$$

$$x^2 + 14x + 49 = 77$$

$$\boxed{(x+7)^2 = 77}$$

$$\begin{array}{r} 49 \\ +28 \\ \hline 77 \end{array}$$

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

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$\left(\frac{14}{2}\right)^2 \quad (7)^2 \quad 49$$

$$X^2 + 14X - 28 = 0$$
$$+28 \quad +28$$

$$X^2 + 14x + \boxed{49} = 28 + \boxed{49}$$
$$(x + 7)(x + 7) = 77$$
$$(x+7)^2 = 77$$
$$-77 \quad -77$$
$$(X+7)^2 - 77 = 0$$

Score 1: The student did not express the equation in the form $(x - p)^2 = q$.

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$x^2 + 14x - 28 = 0$$
$$ + 28 \quad +28$$
$$x^2 + 14x + \underline{49} = 28 + \underline{49}$$

$$\frac{14}{2} = 7$$

$$(7)^2 = 49 \qquad (x + 7)^2 = \pm\sqrt{77}$$

Score 1: The student wrote an incorrect value for q.

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$x^2 + 14x - 28 = 0$$
$$+28 \quad +28$$

$$\left(\frac{14}{2}\right)^2 \quad (7)^2 = 49$$

$$x^2 + 14x + 49 = 28 + 49$$

$$\boxed{(x-7)^2 = 77}$$

Score 1: The student made a factoring error.

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$x^2 + 14x - 28 = 0$$
$$\underline{\qquad +28 \quad +28}$$
$$x^2 + 14x = 28$$

$$\frac{14}{2} = (7)^2$$

$$x^2 + 49 = 28$$
$$-49$$

$$(x + 7)(x + 7) = 21$$
$$\sqrt{(x + 7)^2} = \sqrt{21}$$

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

30 Using the method of completing the square, express $x^2 + 14x - 28 = 0$ in the form $(x - p)^2 = q$.

$$x + 14x - 28 = 0$$
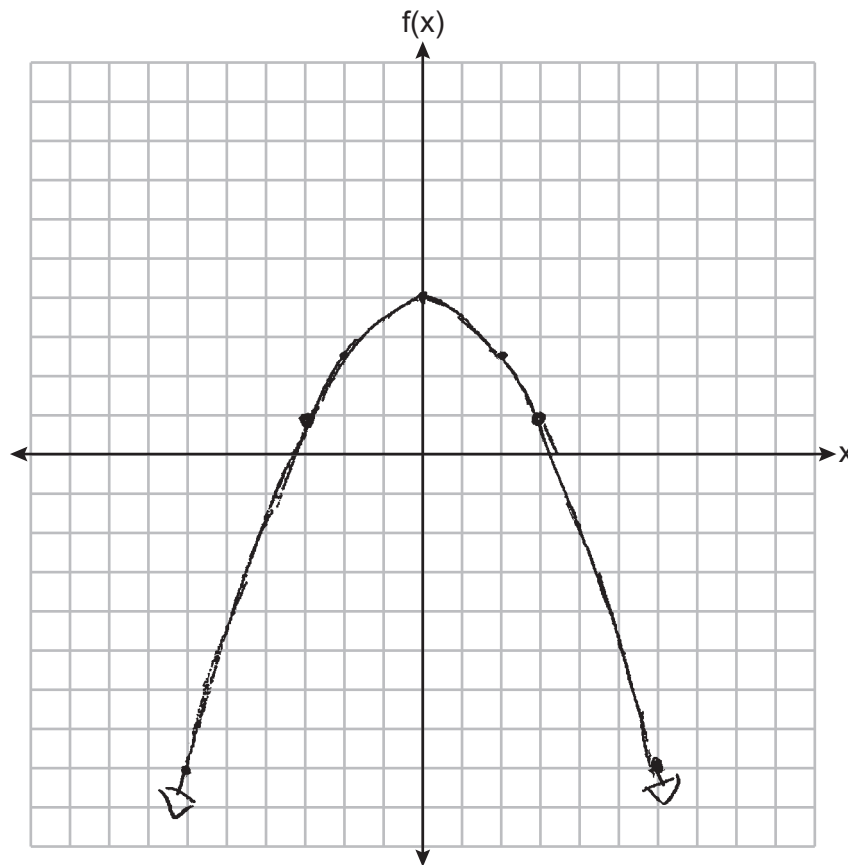$$+28 \quad +28$$

$$x + 14 = 28$$

$$x + 14 + 49 = 28 + 49$$

$$x + 63 = 77$$

$$(x - 7)^2 = 77$$

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

31 Graph $f(x) = -\frac{1}{3}x^2 + 4$ on the set of axes below.

State the vertex of this function.

$(0,4)$

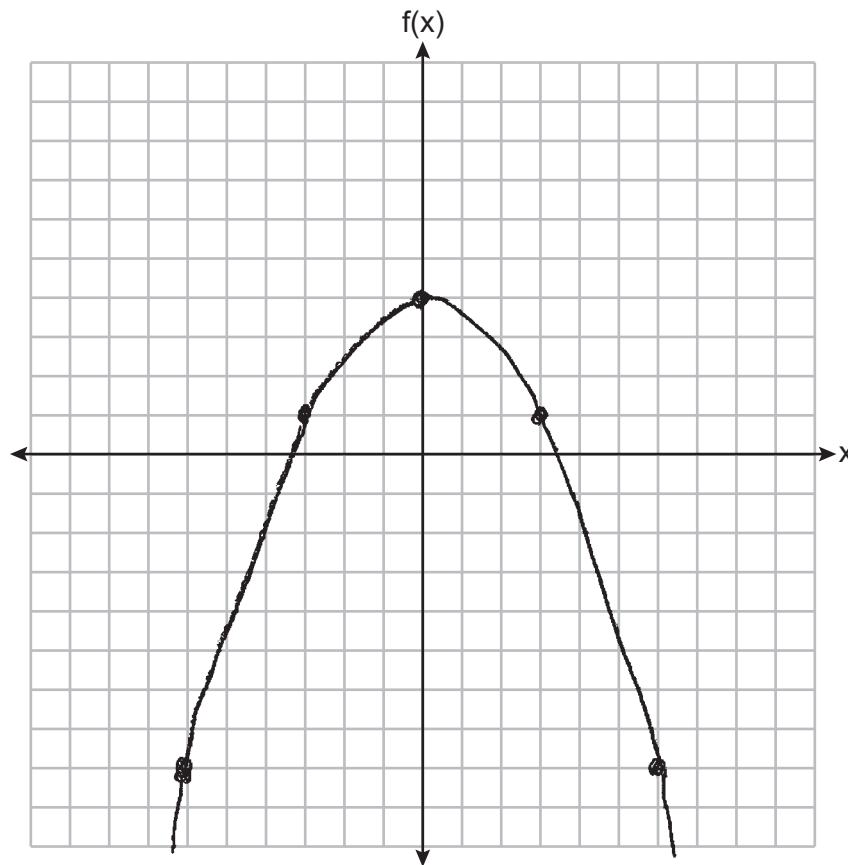State the equation of the axis of symmetry of this function.

$X = 0$

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

31 Graph $f(x) = -\dfrac{1}{3}x^2 + 4$ on the set of axes below.
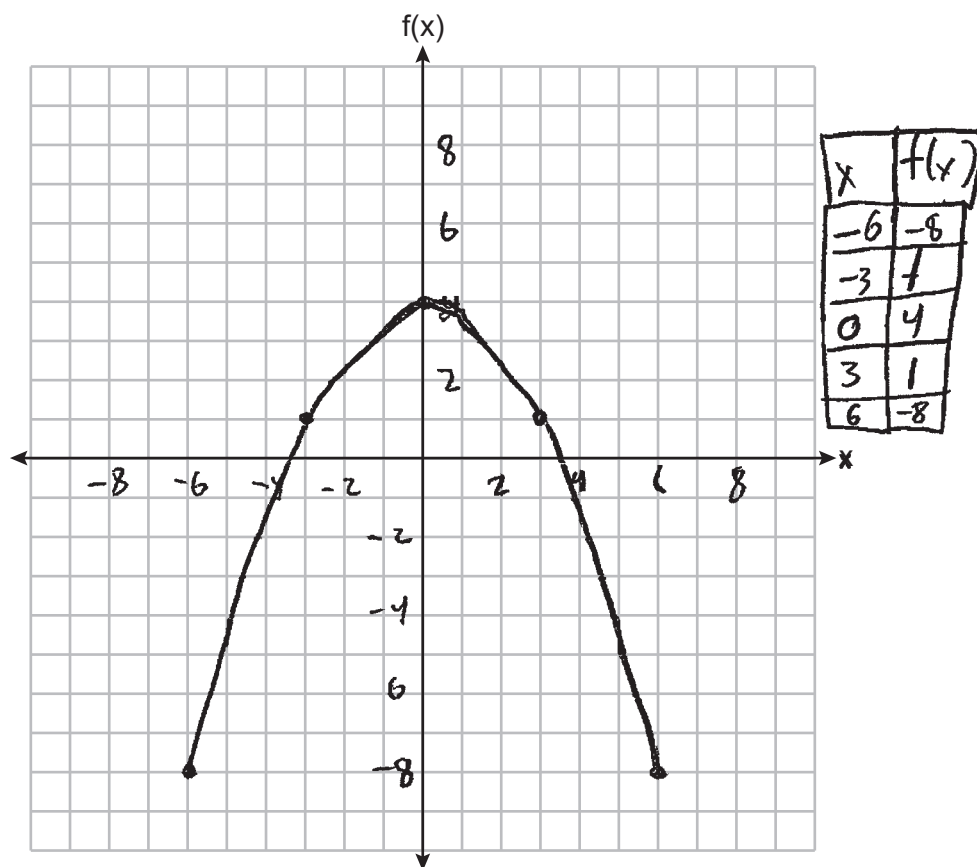

State the vertex of this function.

$$(0,4)$$

State the equation of the axis of symmetry of this function.

$$X=0$$

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

Question 31

31 Graph $f(x) = -\dfrac{1}{3}x^2 + 4$ on the set of axes below.

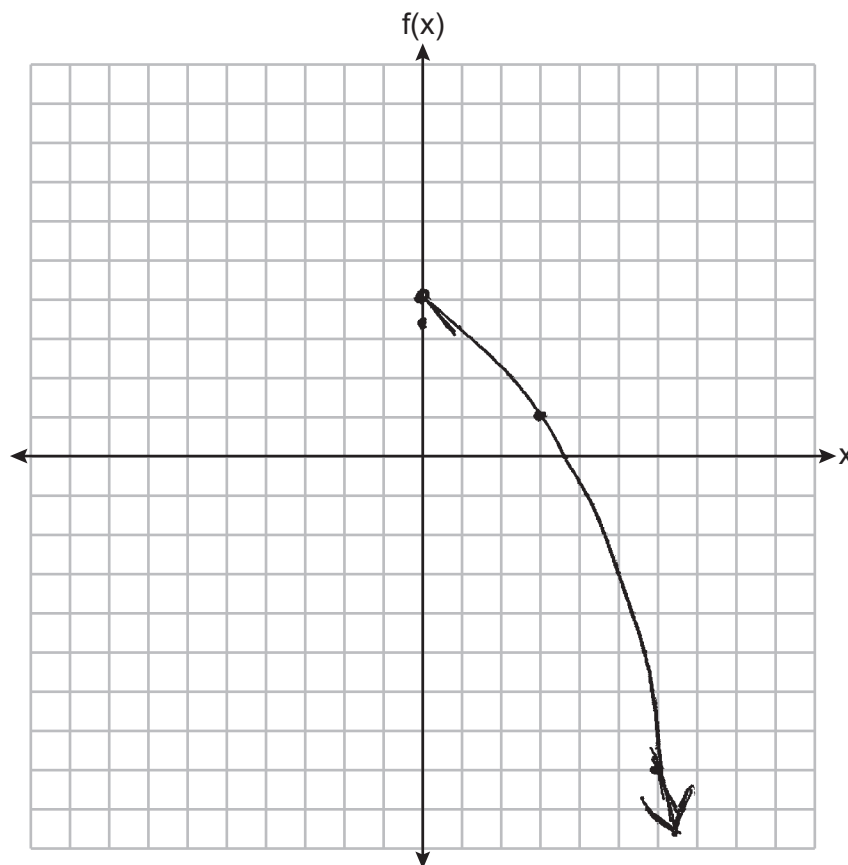| X	f(x)
−6	−8
−3	1
0	4
3	1
6	−8

State the vertex of this function.

$$(0, 4)$$

State the equation of the axis of symmetry of this function.

$$X = 0$$

Score 3: The student made one graphing error.

31 Graph $f(x) = -\frac{1}{3}x^2 + 4$ on the set of axes below.
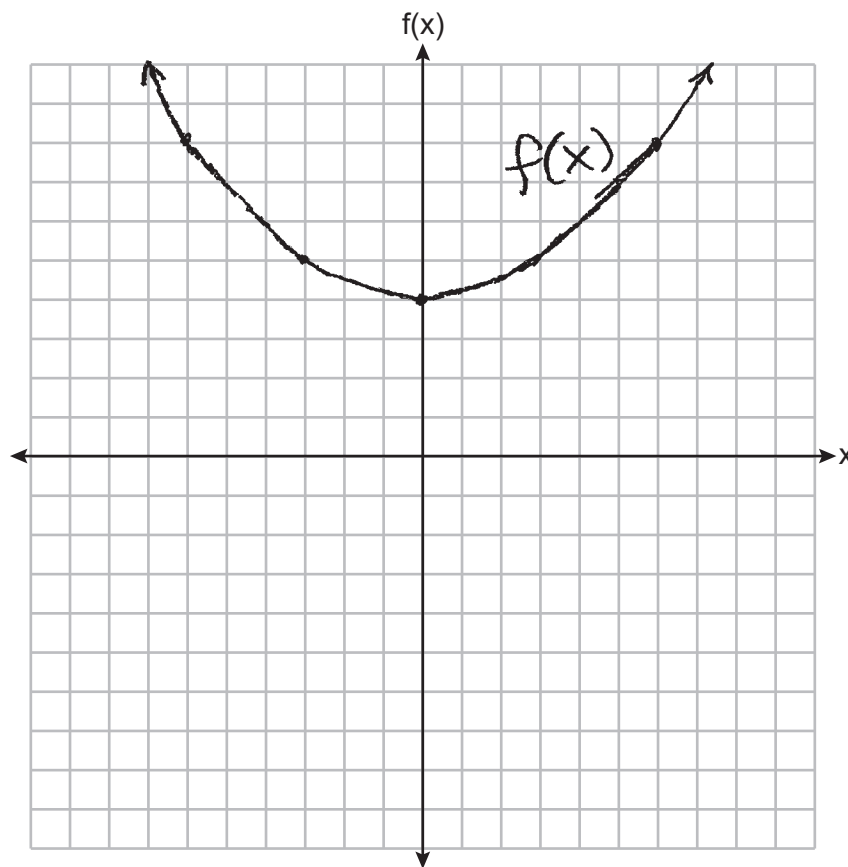
f(x)

State the vertex of this function.

$(0, 4)$

State the equation of the axis of symmetry of this function.

Score 2: The student graphed over the domain $x \geq 0$ and did not state the axis of symmetry.

31 Graph $f(x) = -\frac{1}{3}x^2 + 4$ on the set of axes below.

State the vertex of this function.

$(0,4)$
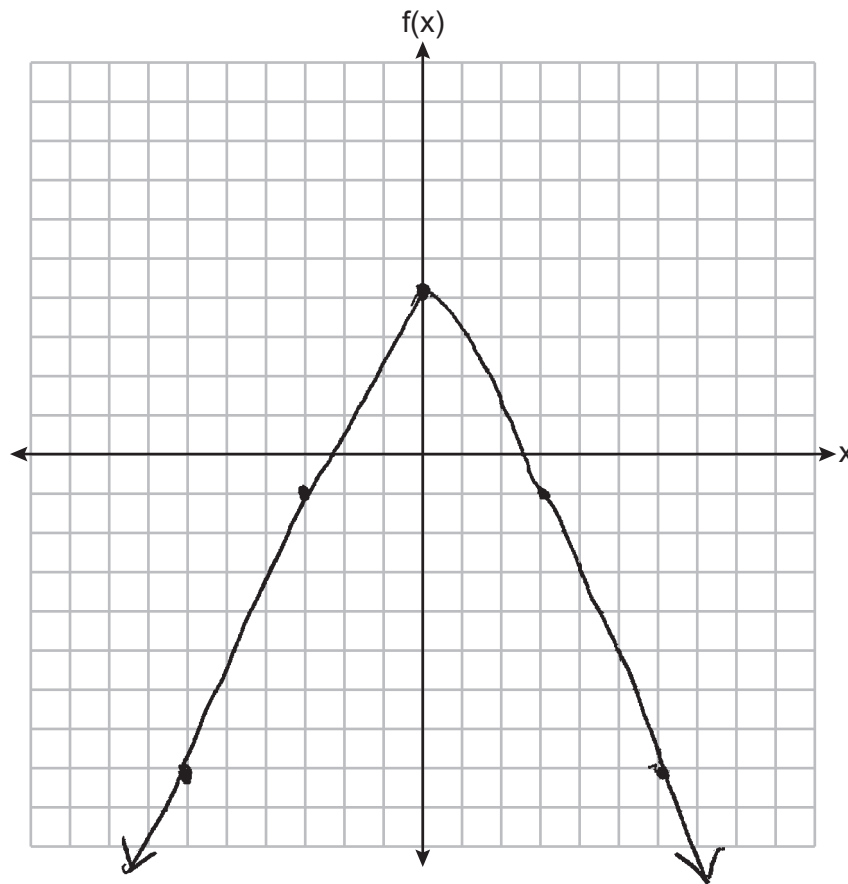
State the equation of the axis of symmetry of this function.

$x = 0$

Score 2: The student stated the vertex and axis of symmetry correctly.

31 Graph $f(x) = -\frac{1}{3}x^2 + 4$ on the set of axes below.

State the vertex of this function.

$$\left(0, 4\right)$$
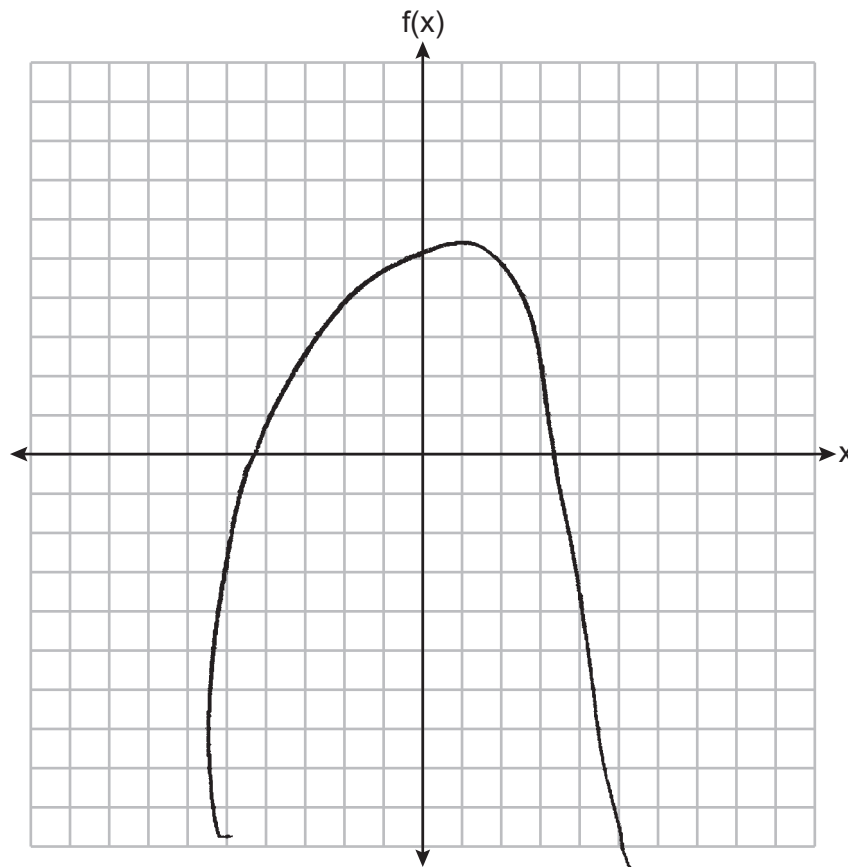
State the equation of the axis of symmetry of this function.

Score 1: The student stated the vertex correctly.

31 Graph $f(x) = -\frac{1}{3}x^2 + 4$ on the set of axes below.

State the vertex of this function.

5

State the equation of the axis of symmetry of this function.

$y = mx + b$

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

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$$18 + 7.50X \leq 78$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$$18 + 7.50X \leq 78$$
$$-18 \qquad\quad -18$$
$$\frac{7.50X}{7.50} \leq \frac{60}{7.5}$$
$$X \leq 8$$

Vince could rent a canoe for 9 hours

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

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$x = $ # of additional hours

$$7.5x + 18 \leq 78$$

max of $78
↓
cost must be less or equal to $\leq$ =

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$7.5x + 18 \leq 78$
$\quad\quad -18 \;\; -18$
_____
$\dfrac{7.5x}{7.5} \leq \dfrac{60}{7.5}$

$x \leq 8$

$x = 8$

Vince could rent a canoe for a maximum of 9 hours.

$x = $ # of additional hours

$18 - $ 1st hour $-$ 1 hour

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

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$$7.50x + 18 \leq 78$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$$9 \text{ hours}$$

$$7.50(8) \leq 66$$

Score 3:　The student did not solve the inequality algebraically.

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$$18 + 7.50x \leq 78$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$$18 + 7.50x \leq 78$$
$$-18 \qquad\qquad -18$$
$$7.50x \leq 60$$
$$\frac{7.50x}{7.50} \leq \frac{60}{7.50}$$
$$x \leq 8$$

Score 3: The student did not state 9 hours.

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$$7.5(x-1) + 18 \leq 78$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$$7.5(x-1) + 18 = 78$$
$$7.5x - 7.5 + 18 = 78$$
$$7.5x + 10.5 = 78$$
$$7.5x = 67.5$$
$$x = 9 \text{ hours}$$

Score 3:   The student wrote an incorrect inequality by writing $x - 1$.

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$$78 = 18 + 7.50x$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$$78 = 18 + 7.50(7)$$

$$78 \neq 70.5$$

$$78 = 18 + 7.50(8)$$

$$78 \equiv 78$$

9 hours

$$78 = 18 + 7.50(6)$$

$$18 \neq 63$$

Score 2: The student wrote an appropriate equation, but did not solve it algebraically.

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$$18 + 7.50x \leq 78$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$$18 + 7.50x \leq 78$$
$$-18 \qquad\quad -18$$
$$\overline{7.50x \leq 60}$$
$$\frac{7.50x}{7.50} \quad \frac{60}{7.50}$$
$$x \geq 8$$

Score 2: The student wrote an incorrect inequality sign in the solution and did not find the maximum number of hours.

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

78 is max

$$18 + 7.50x = 78$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.

$$7.50 \times 8 = 60 + 18 = 78$$

Vince can rent the canoe for 8 hours.

Score 1: The student wrote an appropriate equation.

32 Vince wants to rent a canoe while he is on vacation. The canoe rental company charges $18 for the first hour and $7.50 for each additional hour, x. If Vince has $78 to spend on renting a canoe, write an inequality in terms of x that models this situation.

$$18 + 7.50x$$

Algebraically determine the maximum number of hours that Vince could rent a canoe.
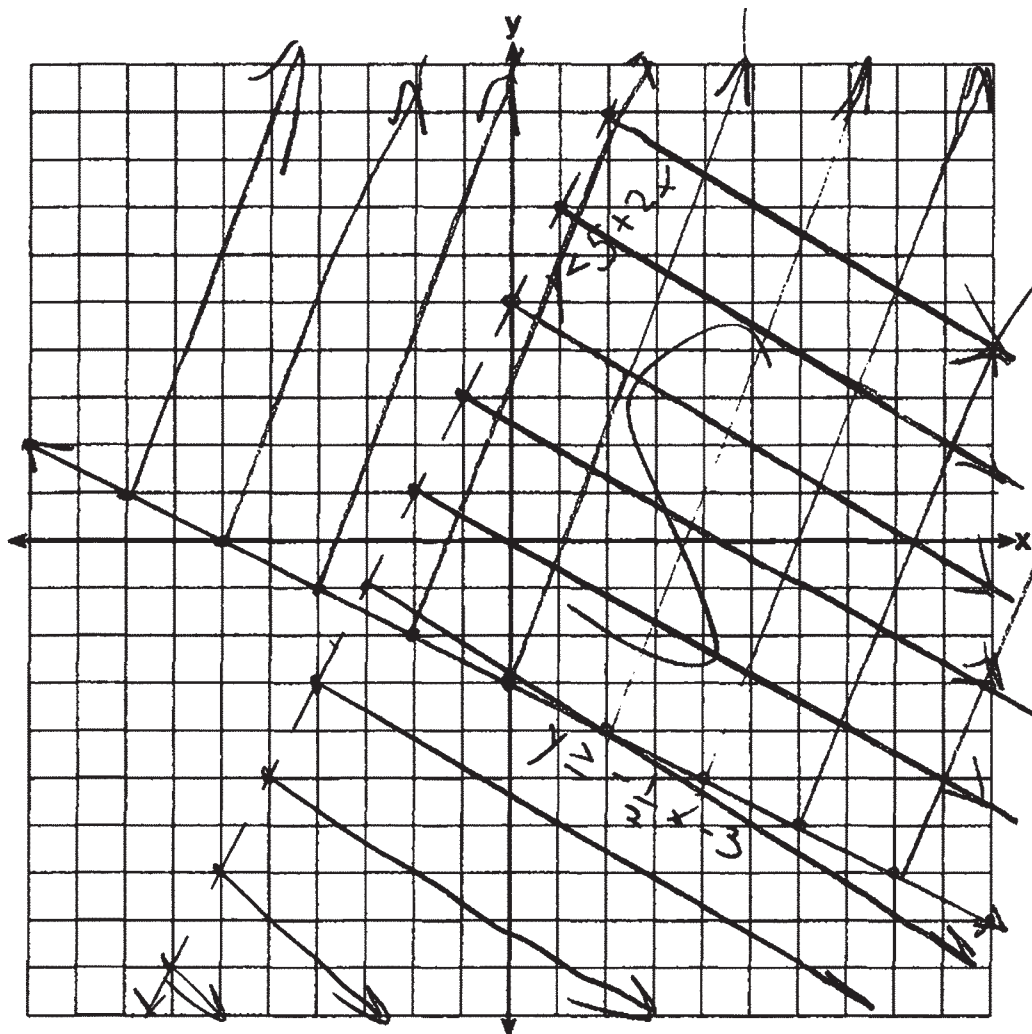
10 hours

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

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

$(0,0)$ is in the "S" region which means both graphs include it.

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

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

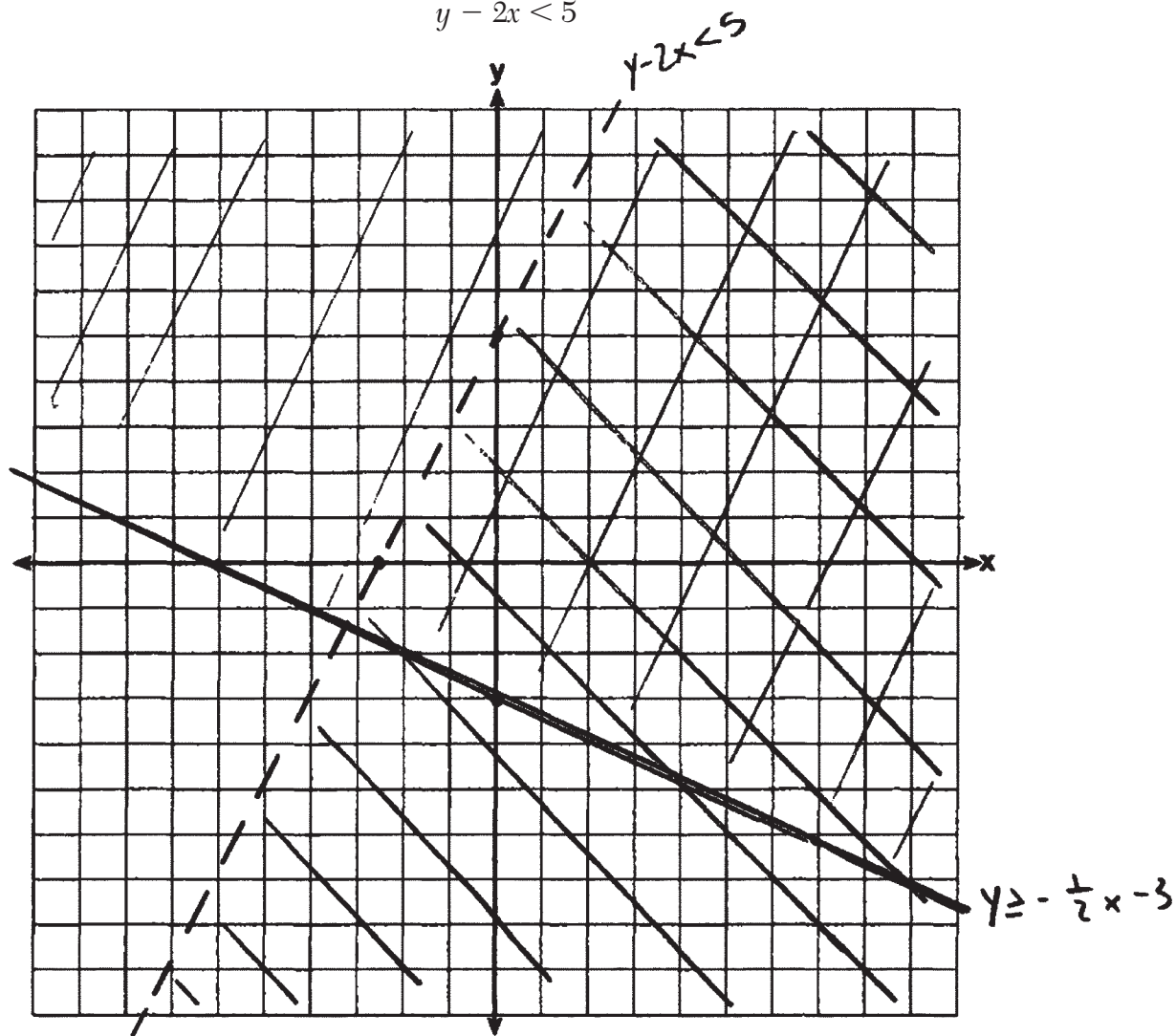(6, 6) because it's in the area that's (double shaded) shaded with both inequalities.

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

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

(-5, 6), the point is in the solution
set of the system of inequalities.

Score 3: The student graphed one inequality correctly and an appropriate point is stated with its justification.

Question 33

33 Graph the following system of inequalities on the set of axes below.

$$\circ \; y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

$$y - 2x < 5$$
$$+2x \qquad +2x$$
$$y < \frac{2x + 5}{1}$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

one solution is (3,3). This is because this is in
the double shaded part of my graph meaning
that all of those are possible solutions
to use.

Score 3: The student did not label at least one of the inequalities.

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5 \qquad y < 2x + 5$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

$$(0, 0)$$

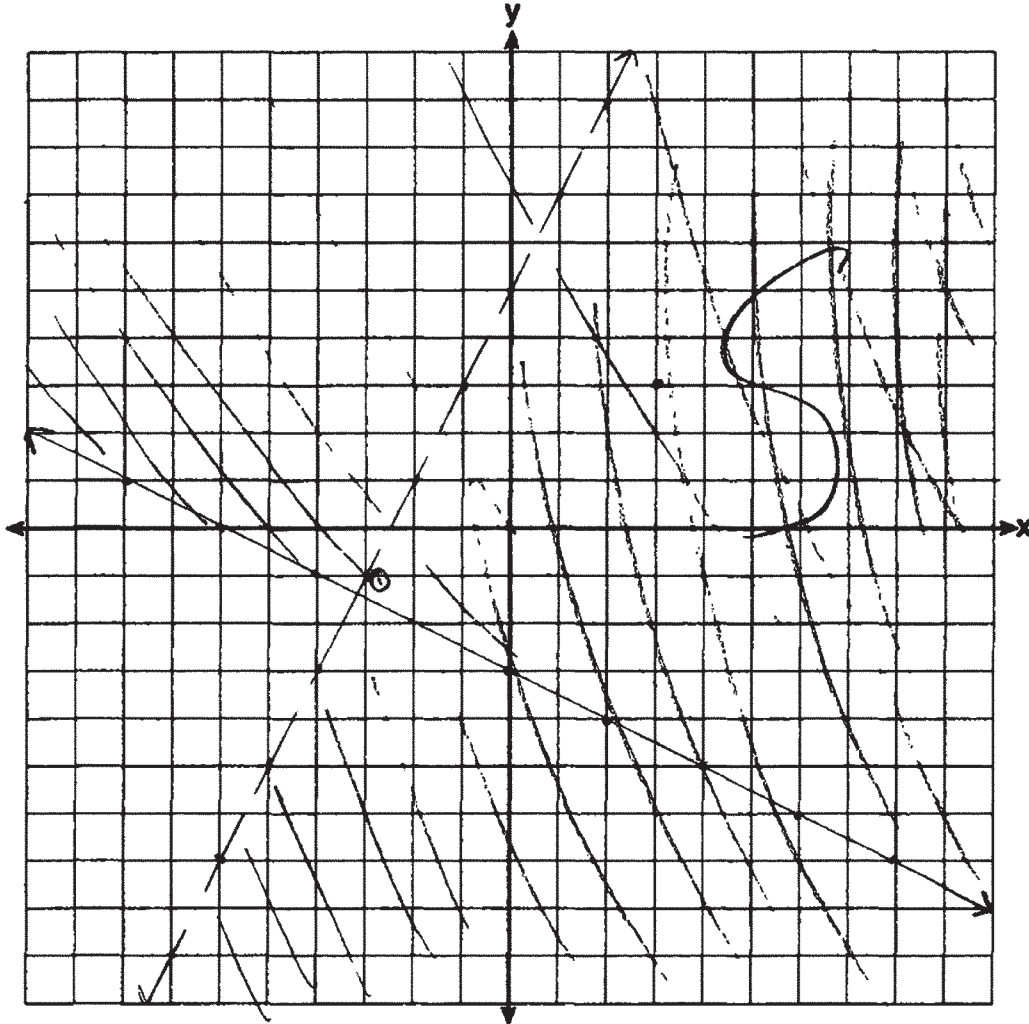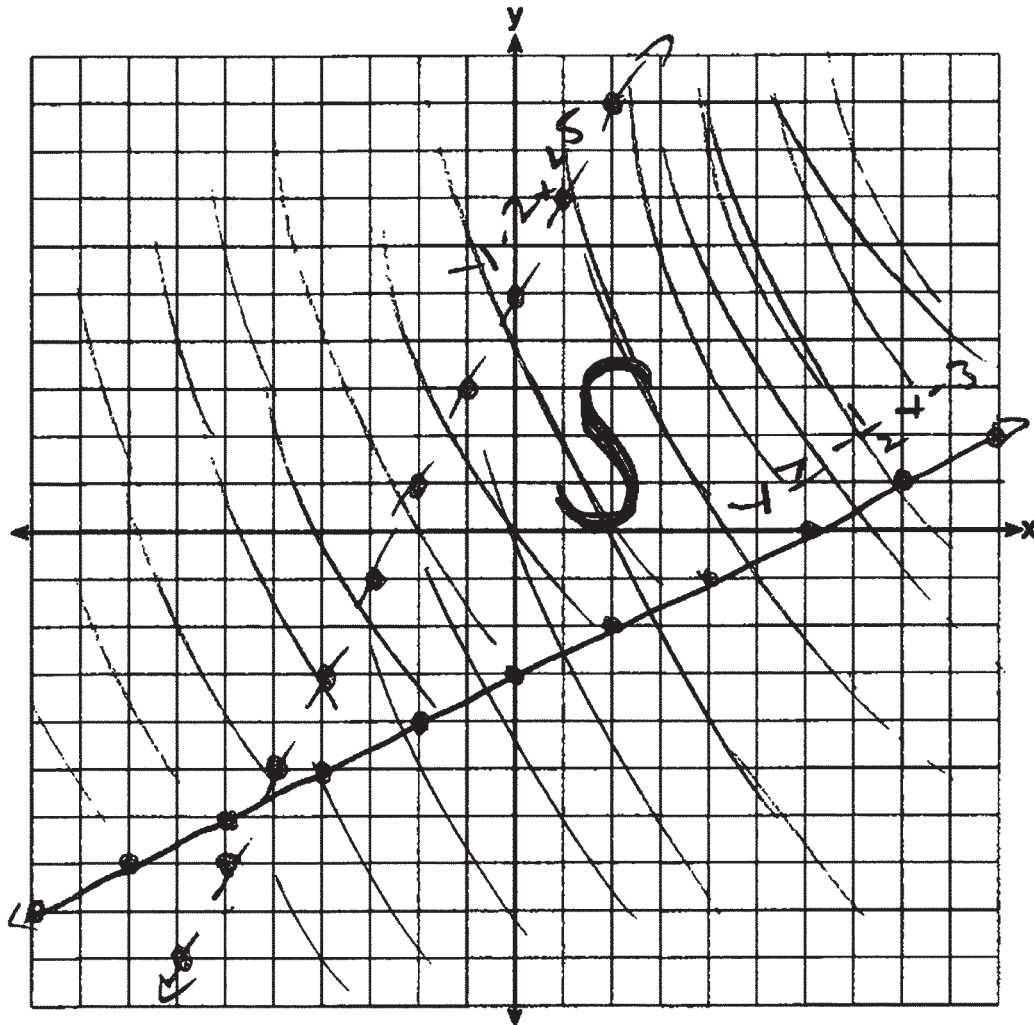**Score 2:** The student graphed one inequality correctly and stated a correct point.

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

$(-7, -2)$

Score 2: The student made one graphing error with shading and stated an appropriate point, but the justification is missing.

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

$$(-1.33, -2.33)$$

Score 1: The student graphed and labeled one inequality correctly.

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

State the coordinates of a point that is in the solution to this system. Justify your answer.

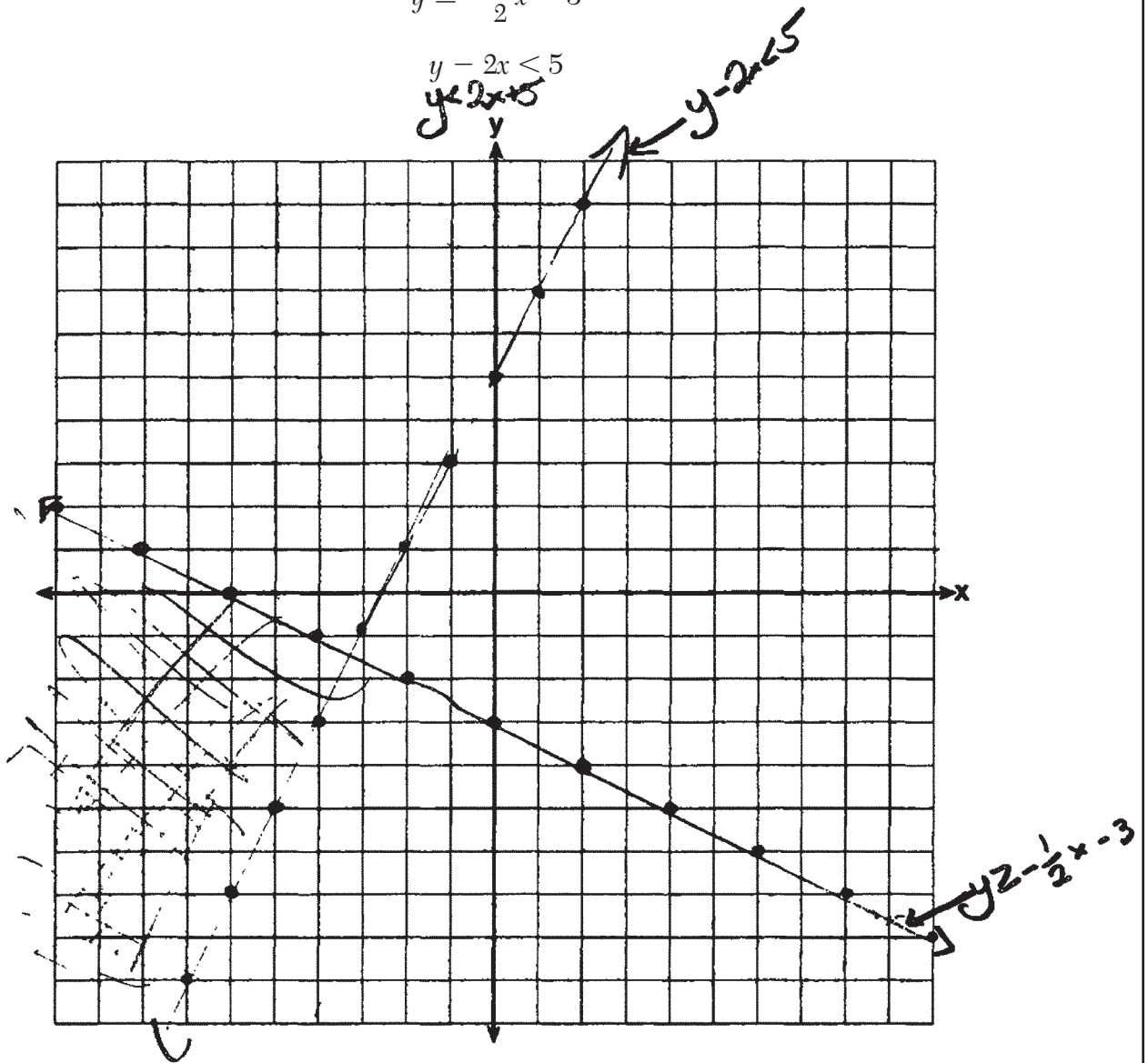**Score 0:** The student made one graphing error, did not label at least one line, and did not state and justify a point in the solution set.

33 Graph the following system of inequalities on the set of axes below.

$$y \geq -\frac{1}{2}x - 3$$

$$y - 2x < 5$$

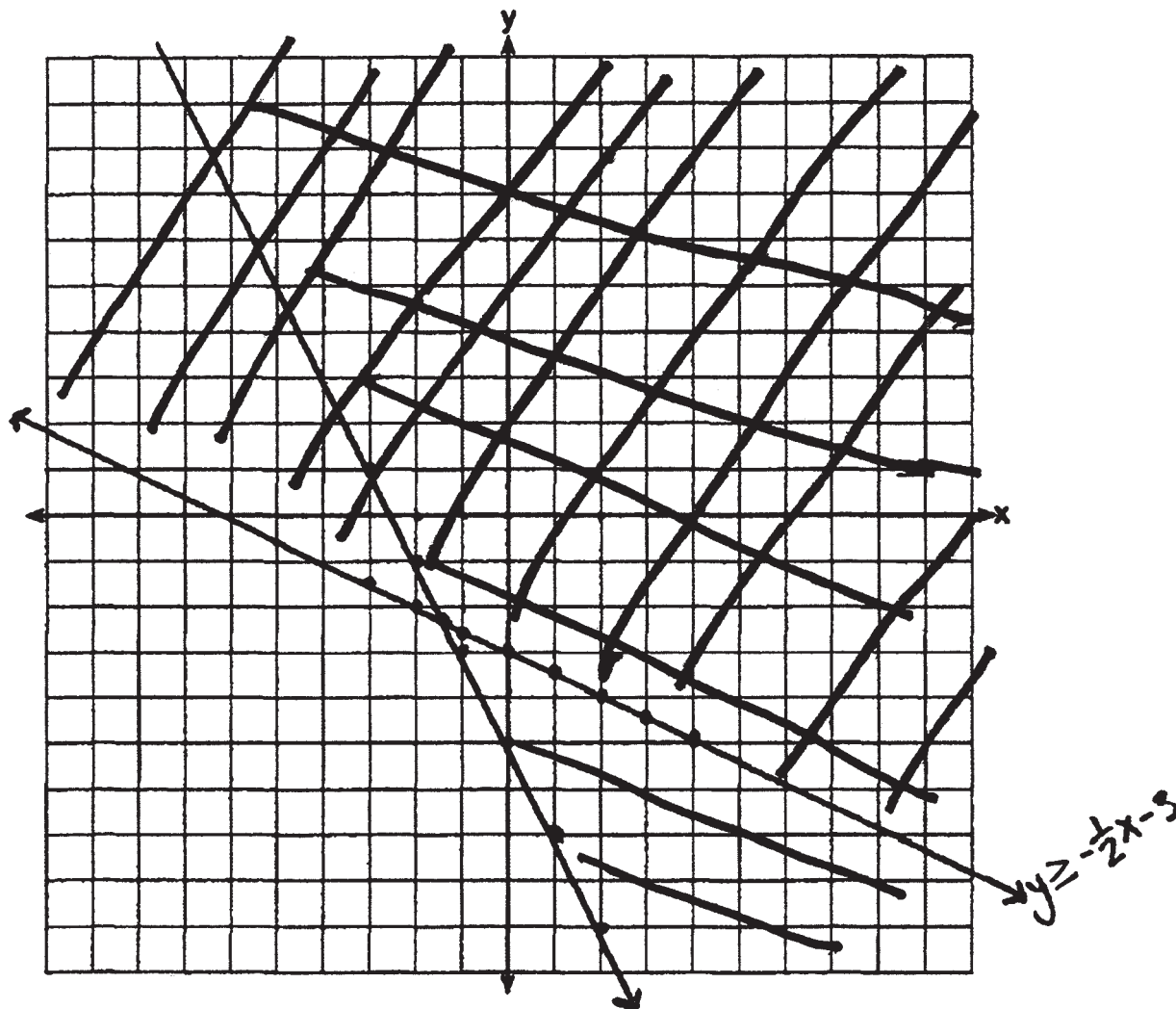State the coordinates of a point that is in the solution to this system. Justify your answer.

(1,5) (10)

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

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$X = \frac{-6 \pm \sqrt{b^2 - 4ac}}{2a}$$

$$X = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)}$$

$$X = \frac{6 \pm \sqrt{24}}{2}$$

$$X = \frac{6 \pm \sqrt{4}\sqrt{6}}{2}$$

$$X = \frac{6 \pm 2\sqrt{6}}{2}$$

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

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$x^2 - 6x + 3 = 0$$

$$\frac{6 \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)}$$

$$\frac{6 \pm \sqrt{24}}{2}$$

$$\frac{6 \pm 2\sqrt{6}}{2} \longrightarrow \text{reduce by } 2$$

$$\boxed{3 \pm \sqrt{6} = x}$$

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

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$x^2 - 6x + 3 = 0$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{24}}{2}$$

$$x = \frac{6 \pm 2\sqrt{3}}{2}$$

$\sqrt{24}$

$\sqrt{4}\sqrt{3}$

$2\sqrt{3}$

$$x = \frac{6 + 2\sqrt{3}}{2}$$

$$x = \frac{6 - 2\sqrt{3}}{2}$$

$$x = 3 + 1\sqrt{3}$$

$$x = 3 - 1\sqrt{3}$$

Score 3: The student made one simplification error.

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$x^2 - 6x + 3 = 0$$

$$a = 1 \quad b = -6 \quad c = 3$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)}$$

$$x = \frac{6 \pm 2 \cdot \sqrt{6}}{2}$$

$$x = 3 \pm 2\sqrt{6}$$

Score 3: The student made one simplification error.

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$x^2 - 6x + 3 = 0$$

$A = 1$
$B = -6$
$C = 3$

$$x = \frac{-b \pm \sqrt{b^2 - 4AC}}{2A}$$

$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{24}}{2}$$

$$x = \frac{6 + \sqrt{24}}{2} \qquad x = \frac{6 - \sqrt{24}}{2}$$

$x = 5.44948974278$

$\boxed{x \approx 5.4}$

$x = 0.550510257217$

$\boxed{x \approx 0.6}$

$$\bigcirc \; 5.4 \quad \text{and} \quad 0.6$$

Score 2: The student wrote $x = \dfrac{6 \pm \sqrt{24}}{2}$, but did not express the answer in simplest radical form.

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$x^2 - 6x + 3 = 0$$
$$\underline{-3 \quad -3}$$
$$\overline{x^2 - 6x = -3}$$
$$\underline{+9 \qquad +9}$$
$$\overline{x^2 - 6x + 9 = 6}$$
$$\sqrt{(x-3)^2} = \sqrt{6}$$
$$x - 3 = \sqrt{6}$$
$$\underline{+3 \qquad +3}$$
$$x = 3 \pm \sqrt{6}$$

Score 2: The student solved the equation by a method other than using the quadratic formula.

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$X = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)}$$

$$X = \frac{6 \pm \sqrt{36 - 12}}{2}$$

$$X = \frac{6 \pm \sqrt{24}}{2}$$

$$X = 3 \pm \sqrt{24}$$

$\sqrt{6} =$

$\sqrt{4} = 2$

$$X = 3 + 2\sqrt{6}$$

$$X = 5\sqrt{6}$$

$y = ax + b$

$a \qquad b \qquad c$

$x^2 - 6x + 3 = 0$

$a = 1$
$b = -6$
$c = 3$

Score 2: The student made two simplification errors.

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$\frac{x^2 - 6x = -3}{x}$$

$$x(x - 6) = -3$$
$$+3$$

$$\boxed{x(x-6) + 3 = 0}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)}$$

$$\boxed{x = 20.4}$$

$$\boxed{x = 15.6}$$

Score 1: The student made a correct substitution into the quadratic formula, but no further correct work was shown.

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$x^2 - 6x + 3 = 0$$
$$-3 \quad -3$$

$$x^2 - 6x = -3$$
$$x^2 - 6x + 9 = -3 + 9$$
$$x^2 - 6x + 9 = 6$$

$$(x-3)^2 = 6$$

Score 1: The student used the method of completing the square and did not solve past $(x - p)^2 = q$.

34 Using the quadratic formula, solve $x^2 - 6x + 3 = 0$.

Express the answer in simplest radical form.

$$x^2 - 6x + 3 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4(a)(c)}}{2a}$$

$$x = \frac{-6 \pm \sqrt{-6^2 - 4(1)(3)}}{2(-6)}$$

$$-4 - 12$$
$$-16$$
$$36$$

$$\frac{-6 \pm \sqrt{16}}{2(-6)}$$

$$\boxed{\frac{-6 \pm \sqrt{16}}{-12}}$$

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

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$x + y = 25$$
$$2.25x + 1.50y = 45$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$x+y=25$
$\frac{-y}{}\frac{-y}{}$
$x=25-y$

$2.25(25-y)+1.5y=45$
$56.25-2.25y+1.5y=45$

$56.25-0.75y=45$
$\underline{-56.25}$
-56.25

$-0.75y=-11.25$
$\frac{-0.75y}{-0.75} = \frac{-11.25}{-0.75}$

$\boxed{y=15}$

$x+15=25$
$\underline{-15-15}$

$x=10$

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$\boxed{6 \text{ hot dogs}}$$

$2.25x + 1.5(4) \le 20$

$2.25x + 6 \le 20$
$-6 -6$

$\frac{2.25x}{2.25} = \frac{14}{2.25}$

$x \le 6.2 \text{ round down}$

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

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$x = \text{hot dog}$$
$$y = \text{Soda}$$

$$x + y = 25$$
$$2.25x + 1.50y = \$45.00$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$\begin{array}{c} 75 \\ 2.25x + 1.5y = 45 \\ \div \tfrac{2}{3} \quad \times \tfrac{2}{3} \quad \times \tfrac{2}{3} \end{array}$$

$$1.5x + y = 30$$

$$2.25x + 1.5y = 45$$
$$22.5 + 22.5 = 45$$
$$45 = 45$$

$$1.5x + y = 30$$
$$-(x + y = 25)$$
$$\overline{}$$
$$0.5x = 5$$
$$x = 10$$

$$10 + y = 25$$
$$\boxed{x = 10 \quad y = 15}$$

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$2.25x + 4(1.50) = 20$$
$$2.25x + 6 = 20$$
$$2.25x = 14$$
$$\div 2.25 \quad \div 2.25$$
$$x = 6.\overline{2}$$
$$\boxed{6 \text{ hot dogs}}$$

$$\frac{9}{4}$$

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

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$x+y=25$$
$$2.25x+1.50y=45$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$x+y=25$$
$$-x-x$$
$$y=25-x$$

$$\boxed{\begin{array}{l}10\ hot\ dogs\\ 15\ sodas\end{array}}$$

$$\frac{.75x=7.5}{.75}$$
$$x=10$$

$$10+y=25$$
$$-10-10$$
$$\overline{y=15}$$

$$2.25x+1.50(25-x)=45$$
$$2.25x+37.5-1.5x=45$$
$$-37.5-37.5$$
$$.75x=7.5$$

$$2.25(10)+1.5(15)=45$$
$$22.5+22.5=45$$

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$2.25X+1.50(4)\le20$$
$$2.25X+6\le20$$
$$-6-6$$
$$\frac{2.25x\le14}{2.25}$$
$$X\le6$$

$$\boxed{X\le6}$$

Score 5: The student did not state the maximum number of hot dogs.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$\frac{x+y=25}{2.25x+1.5y=45}$$

$$x+y=25$$
$$2.75x+1.5y=45$$

$$2.25x+1.5y=45$$
$$y=25-x$$
$$y=25-6 \quad y=19$$
$$2.25x+1.5(25-x)=45$$
$$2.75x+37.5-1.5x=45 \quad \frac{1.25x}{1.25}=\frac{7.5}{1.25}$$
$$1.25x+37.5=45 \quad x=6$$
$$-37.5 \quad -37.5$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$x=6$$

$$y=19$$

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$4(1.50)+x=20$$
$$6+x=20$$
$$-6 \qquad -6$$
$$\qquad\qquad 2.25\overline{)14}^{\,6.22}$$
$$x=14$$
$$x=\$14$$

$$\boxed{6}$$

Score 5: The student made one transcription error in rewriting $2.25x$ as $2.75x$.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$45 = 2.25x + 1.50y$$
$$25 = x + y$$

10 hotdogs sold and 15 sodas were sold

$$2.25 \times 10 = 22.5$$
$$1.50 \times 15 = 22.5 \quad \text{(45)}$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

10 hotdogs and 15 sodas were sold

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$1.5 \times 4 = 6$$
$$20 - 6 = 14$$
$$14 / 2.25 = 6.2\overline{2} \quad \text{maximum}$$

6 hotdogs & 4 sodas were sold

Score 5: The student found $x = 10$ and $y = 15$ by a method other than algebraic.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$25 = x + y$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

Cameron sold 15 sodas and 10 hot dogs.

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

A customer is able to buy 6 hot dogs if he purchased 4 sodas.

$$\begin{array}{r} 20 \\ -\ 6 \\ \hline 14 \end{array} \qquad \begin{array}{r} 2.25 \\ \times\ \ 6 \\ \hline 13.5 \end{array}$$

Score 4: The student wrote one correct equation, stated 15 sodas and 10 hot dogs, and determined the maximum number of hot dogs.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$2.25x + 1.5y = 45$$
$$x + y = 25$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$x = 20 - 0.\overline{6}y$$
$$y = 30 - 1.5x$$

$$2.25x + 1.5y = 45$$
$$-2.25x \qquad -2.25x$$
$$\overline{\quad 1.5y = -2.25x + 45 \quad}$$
$$\overline{\qquad\qquad 1.5 \qquad}$$
$$y = -1.5x + 30$$
$$x = 20 - 0.\overline{6}y$$

$$X = (20, 0)$$
$$Y = (0, 30)$$

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

The maximum number of hot dogs that the customer can purchase if he buys four sodas are 6 hot dogs.

$$2.25x + 1.5(4) = 20$$
$$2.25x + 6 = 20$$
$$\underline{\quad -6 \quad -6 \quad}$$
$$\frac{2.25x = 14}{2.25}$$
$$x = 6.\overline{2}$$

Score 4: The student wrote two correct equations and determined the maximum number of hot dogs.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of <u>25 items</u> for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$\$2.25x + \$1.50y = \$45.00$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$\$2.25x + 1.50y = \$45.00$$

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$1.50 \cdot 4 = 6.00$$
$$20 - 6 = 14$$
$$14 \div 2.25 = 6.2$$

$$Max = 6 \ hotdogs$$

Score 3:   The student wrote one correct equation and determined the maximum number of hot dogs.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$y = 2.25x + 1.50y = 25$$

$$2.$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$2.25h + 1.50s = 25 \qquad 2.25 \times 10 = 22.5$$
$$1.50 \times 15 = 22.5$$

$$22.5 + 22.5 = 45.00$$

Cameron sold 10 hot dogs and 15 sodas

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$2.25h + 1.50s = 20$$
$$1.50 \times 4 = 6.00 \qquad 13.5 + 6.00 = 19.5$$
$$2.25 \times 6 = 13.5$$

the maximum this customer can buy is 6 hotdogs because if she or he buys more then 6 it will pass the limit of 20.

Score 3: The student stated 10 hot dogs and 15 sodas and found the maximum number of hot dogs.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$2.25h + 1.50s = 4500$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$2.25(19.33) + 1.50s = 4500$$
$$43.49 + 1.50s = 4500$$
$$-43.49$$
$$\frac{1.50s}{1.50} = \frac{1.51}{1.50}$$
$$s = 1$$

$$2.25h + 1.50s = 4500$$
$$-1.50 \quad -1.50$$
$$\frac{2.25h}{2.25} = \frac{43.50}{2.25}$$
$$h = 19.38$$

$$19.33 \div 2.25$$
$$\text{but } 9$$
$$\text{dgs} = 9$$
$$\text{Sodas} = 2$$

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$4 \times 1.50 = 6\,00$$
$$20 - 6.00 = 14.00$$
$$14 \div 2.25 = \boxed{6}.2$$

$$\underline{6 \text{ dgs}}$$

Score 2: The student only determined the maximum number of hot dogs.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

Let

$x =$ number of hot dogs

$y =$ number of sodas

$$2.25x + 1.50y = 45.00$$

$$x \, y = 25$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$2.25\,(10) + 1.50\,(15) = 45.00$$

$$22.5 + 22.5 = 45$$

Cameron sold 10 hot dogs and 15 cans of soda

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

$$2.25x + 1.50y = 20$$

Score 2: The student wrote one correct equation and stated 10 hot dogs and 15 sodas.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$Y = 45.00 (2.25 \cdot 1.50)$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

He was
able to sell 10
hot dogs and
15 sodas

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

4 sodas
leaves the customer
enough to buy 6
Hotdogs

Score 2: The student stated 10 hot dogs and 15 sodas and stated the maximum number of hot dogs.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$2.25x + 1.50y = 45$$
$$2.25x + 1.50y = 25$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

Score 1: The student only stated one equation correctly.

35 Cameron sold hot dogs and sodas at a concession stand. He sold a total of 25 items for $45.00. A hot dog sold for $2.25 and a soda sold for $1.50. All prices include tax.

If x represents the number of hot dogs sold and y represents the number of sodas sold, write a system of equations that models this situation.

$$X = 25x + 45x$$
$$Y = 225 + 7.50$$

Determine algebraically the number of hot dogs Cameron sold and the number of sodas he sold.

$$\frac{25 + 45}{225 + 7.50} = 73.75$$

the number of hot dogs and of sodas is 73.75

A customer has $20 to spend at the concession stand. Determine and state the maximum number of hot dogs he can purchase if he buys four sodas.

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