The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Wednesday, January 23, 2019 — 1:15 to 4:15 p.m.

MODEL RESPONSE SET

Table of Contents

Question 25

25 Solve algebraically for x: $3600 + 1.02x < 2000 + 1.04x$

$-2000 \qquad -2000$

$1600 + 1.02x < 1.04x$

$-1.02x \qquad -1.02x$

$\frac{1600}{.02} < \frac{.02x}{.02}$

$80000 < x$

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

Question 25

25 Solve algebraically for x: $3600 + 1.02x < 2000 + 1.04x$

$-1.02x \quad -1.02x$

$3600 < 2000 + .02x$

$-2000 \quad -2000$

$\frac{1600}{.02} < \frac{.02x}{.02}$

$x = 80{,}000$

Score 1: The student wrote an equation instead of an inequality.

Question 25

25 Solve algebraically for x: $3600 + 1.02x < 2000 + 1.04x$

$3600 + 1.02x < 2000 + 1.04x$

$-3600 \quad -3600$

$1.02x < -1600 + 1.04x$

$-1.04x \quad -1.04x$

$-.02x < -1600$

$\frac{-.02x}{-.02} < \frac{-1600}{-.02}$

$x < -80{,}000$

Score 0: The student made an error when dividing -1600 by $-.02$ and an error writing the inequality sign.

Question 26

26 The number of people who attended a school's last six basketball games increased as the team neared the state sectional games. The table below shows the data.

Game	13	14	15	16	17	18
Attendance	348	435	522	609	696	783

+1

+87 +87 +87 +87

State the type of function that best fits the given data. Justify your choice of a function type.

linear, This is because there is a constant rate of change of 87.

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

Question 26

26 The number of people who attended a school's last six basketball games increased as the team neared the state sectional games. The table below shows the data.

Game	13	14	15	16	17	18
Attendance	348	435	522	609	696	783

State the type of function that best fits the given data. Justify your choice of a function type.

A linear because it is a straight line due to the fact that it has a constant slope.

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

Question 26

26 The number of people who attended a school's last six basketball games increased as the team neared the state sectional games. The table below shows the data.

Game	13	14	15	16	17	18
Attendance	348	435	522	609	696	783

State the type of function that best fits the given data. Justify your choice of a function type.

(13,348) (14,435) $435 + 87 = 522$

$\frac{435-348}{14-13} = 87$

slope=87

Score 1: The student gave a correct justification, but did not state the type of function.

Question 26

26 The number of people who attended a school's last six basketball games increased as the team neared the state sectional games. The table below shows the data.

Game	13	14	15	16	17	18
Attendance	348	435	522	609	696	783

State the type of function that best fits the given data. Justify your choice of a function type.

Exponential because r = .9931

Score 1: The student made a conceptual error.

Question 26

26 The number of people who attended a school's last six basketball games increased as the team neared the state sectional games. The table below shows the data.

Game	13	14	15	16	17	18
Attendance	348	435	522	609	696	783

State the type of function that best fits the given data. Justify your choice of a function type.

The function increases.

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

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$X = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(-9)}}{2(1)}$

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

$\frac{8 \pm \sqrt{64 + 36}}{2} = \frac{8 \pm \sqrt{100}}{2}$

$= \frac{8 \pm 10}{2}$

$X = 9$

$X = \frac{8 + 10}{2} = \frac{18}{2}$

$X = -1$

$X = \frac{8 - 10}{2} = \frac{-2}{2}$

Explain the first step you used to solve the given equation.

I had to use the quadratic formula and substitute then solve.

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

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$(x-9)(x+1)=0$

$x-9=0$ $\quad +9 \quad +9$

$x=9$

$x+1=0$ $\quad -1 \quad -1$

$x=-1$

Explain the first step you used to solve the given equation.

The first step I used was factoring the equation algebraically.

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

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$X^2 - 8X - 9 = 0$

$(X^2 + 1X) + (-9X - 9) = 0$

$X(X + 1) - 9(X + 1) = 0$

$0 = (X - 9)(X + 1) = 0$

$+9 \quad +9 \qquad -1 \quad -1$

$9 = X \qquad X = -1$

$A = 1$
$B = -8$
$C = -9$
$(A)(C)$
-9

Explain the first step you used to solve the given equation.

The first step I did was to group with factors of (A)(C) that add up to B

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

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$x^2 - 8x = 9$

$x^2 - 8x + 16 = 9 + 16$

$(x-4)^2 = 25$

$(x-4) = 5$

$x = 9$

Explain the first step you used to solve the given equation.

I took the nine and switched it's polarity from negative to positive and moved it to the other side.

Score 1: The student did not write both values when calculating the square root of 25.

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$(x-9)(x+1)=0$

$x-9=0$ $\quad x+1=0$

$+9\ +9$ $\quad -1\ -1$

$x=9$ $\quad x=-1$

Explain the first step you used to solve the given equation.

the first step that I did was to distribute the binomial.

Score 1: The student wrote an incorrect explanation.

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$(x-1)(x+9) = 0$

$x = 1 \quad x = -9$

Explain the first step you used to solve the given equation.

I factored the trinomial.

Score 1: The student reversed the signs when factoring.

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$x^2 - 8x = 9$

$(x-8)^2 + \boxed{64} = 9 + \boxed{64}$

$\sqrt{(x-8)^2} = \sqrt{73}$

$x - 8 = \pm\sqrt{73}$

$\boxed{x = 8 \pm \sqrt{73}}$

Explain the first step you used to solve the given equation.

I added 9 to both sides to complete the square

Score 1: The student made a conceptual error in completing the square, but explained the first step correctly.

Question 27

27 Solve $x^2 - 8x - 9 = 0$ algebraically.

$x^2-8x-9+27-27$

$(x^2-8x+16)-27$

$(x-4)(x-4)-27$

$x-4=0$ | $x-4-27=0$

$+4 \quad +4$ | $x-31=0$

$x=4$ | $+31 \quad +31$

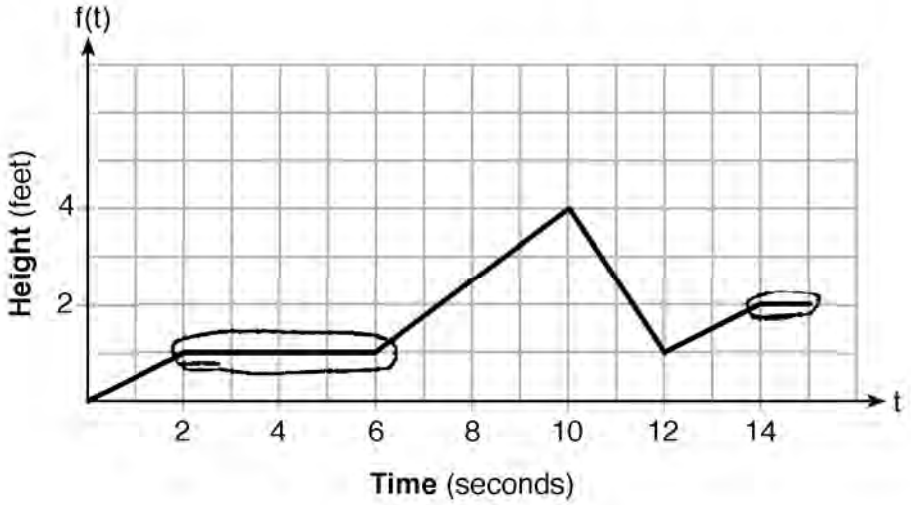
$x=31$

Explain the first step you used to solve the given equation.

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

Question 28

28 The graph of $f(t)$ models the height, in feet, that a bee is flying above the ground with respect to the time it traveled in t seconds.



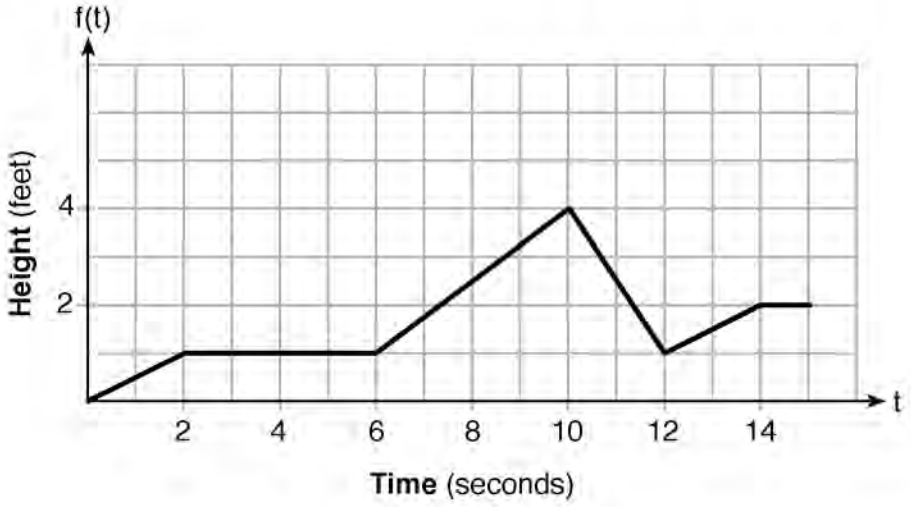
State all time intervals when the bee's rate of change is zero feet per second. Explain your reasoning.

The bee's rate of change is zero feet per second in the 2-6 interval and the 14-15 interval. During those time periods, the bee did not fly up nor down, maintaining a steady rate of zero.

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

Question 28

28 The graph of $f(t)$ models the height, in feet, that a bee is flying above the ground with respect to the time it traveled in t seconds.



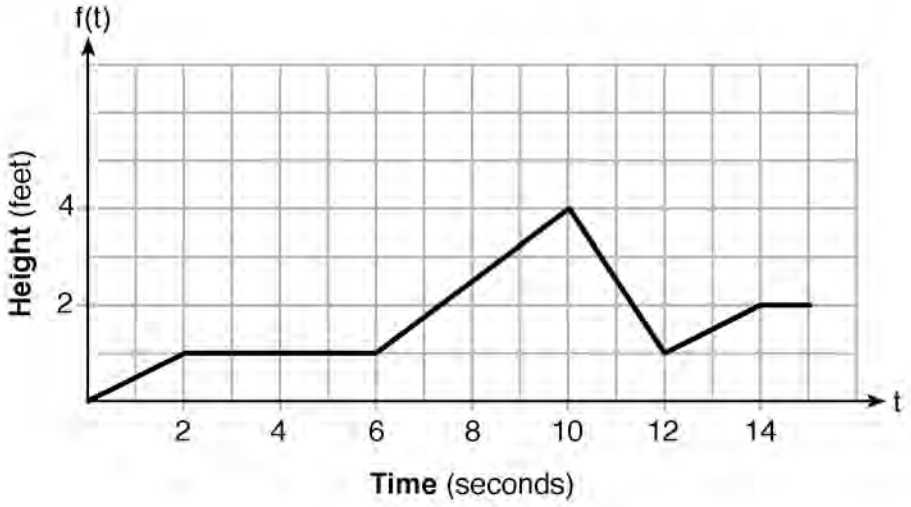
State all time intervals when the bee's rate of change is zero feet per second. Explain your reasoning.

During the time intervals $2<x<6$ and $14<x<15$, the bee's rate of change is 0. This is because the bee doesn't change the height of its flight pattern during these time intervals.

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

Question 28

28 The graph of $f(t)$ models the height, in feet, that a bee is flying above the ground with respect to the time it traveled in t seconds.



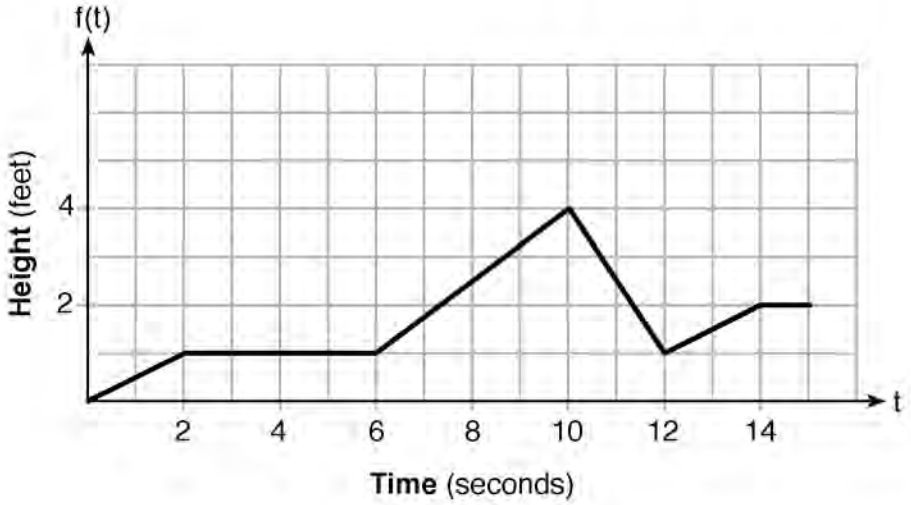
State all time intervals when the bee's rate of change is zero feet per second. Explain your reasoning.

The bee's rate of change is zero feet per second when the intervals are [2,6] and [14, 15]. When $2 \leq t \leq 6$, the bee is 1 foot above ground. When $14 \leq t \leq 15$, the bee is 2 feet above ground. During these time periods, the slope is zero.

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

Question 28

28 The graph of $f(t)$ models the height, in feet, that a bee is flying above the ground with respect to the time it traveled in t seconds.



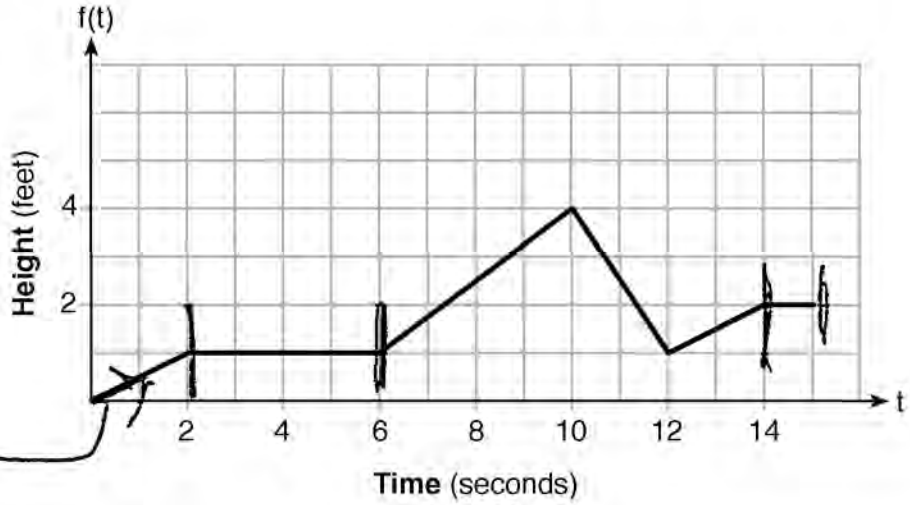
State all time intervals when the bee's rate of change is zero feet per second. Explain your reasoning.

Between 2 and 4, and 4 and 6 seconds because the height did not change.

Score 1: The student did not state all the intervals, but wrote a correct explanation.

Question 28

28 The graph of $f(t)$ models the height, in feet, that a bee is flying above the ground with respect to the time it traveled in t seconds.



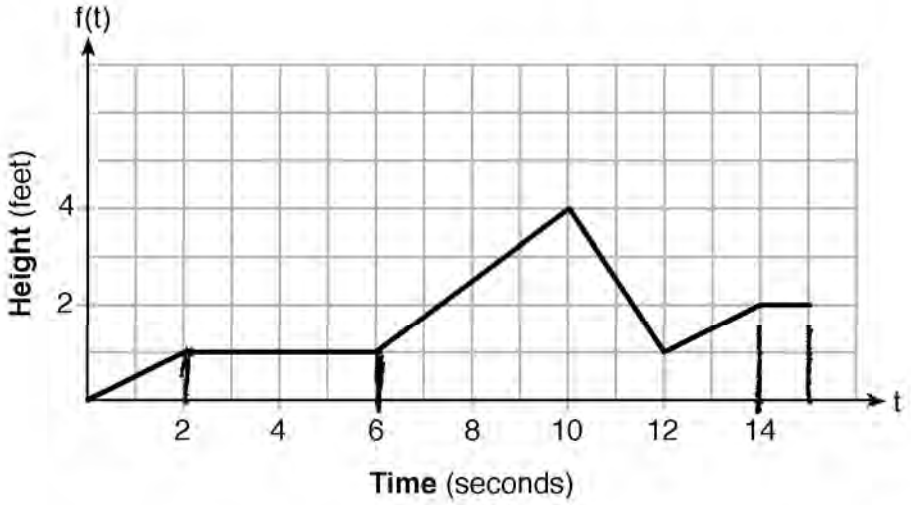
State ~~all time~~ intervals when the bee's rate of change is zero feet per second. Explain your reasoning.

[2, 6] [14, 15]

Score 1: The student did not write an explanation.

Question 28

28 The graph of $f(t)$ models the height, in feet, that a bee is flying above the ground with respect to the time it traveled in t seconds.



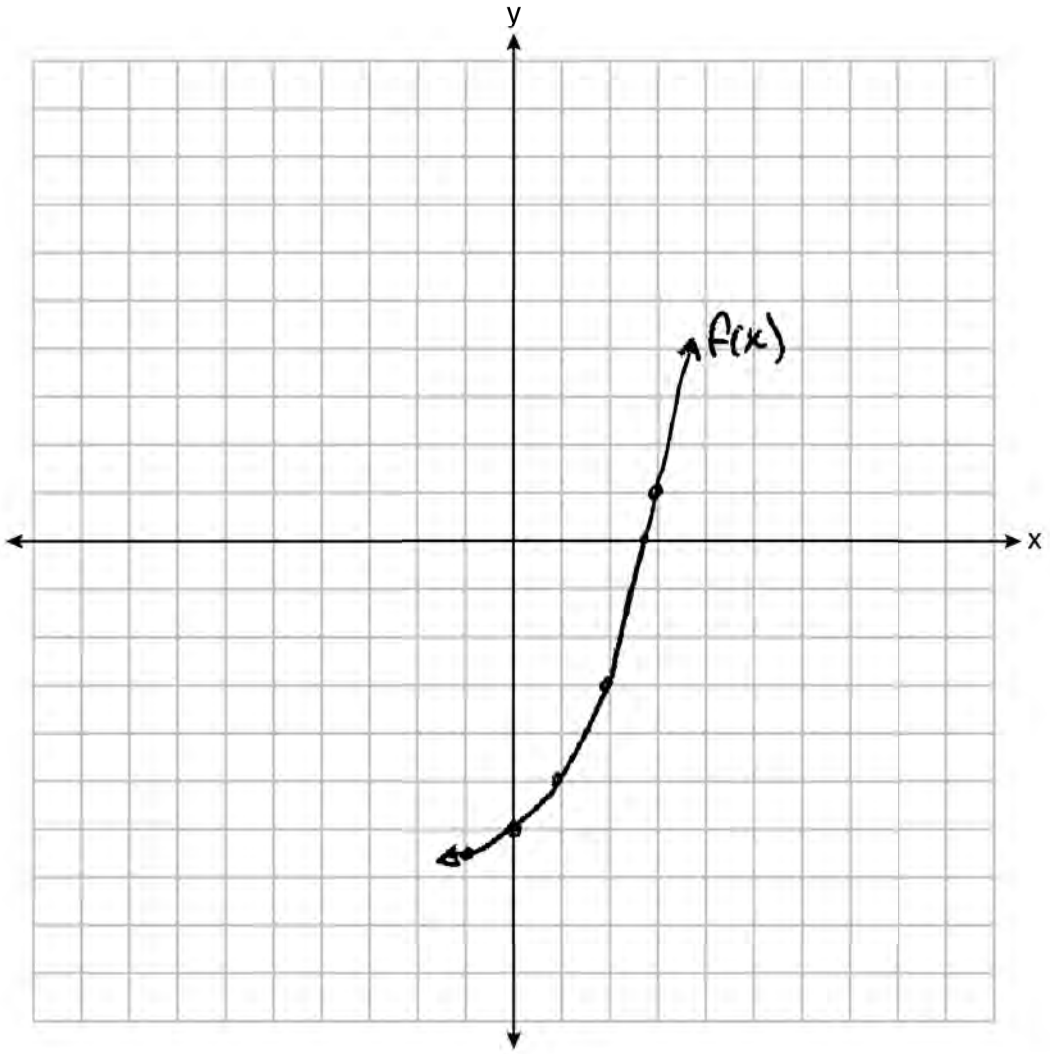
State all time intervals when the bee's rate of change is zero feet per second. Explain your reasoning.

2 - 6 seconds

Score 0: The student stated only one interval and did not write an explanation.

Question 29

29 Graph the function $f(x) = 2^x - 7$ on the set of axes below.



If $g(x) = 1.5x - 3$, determine if $f(x) > g(x)$ when $x = 4$. Justify your answer.

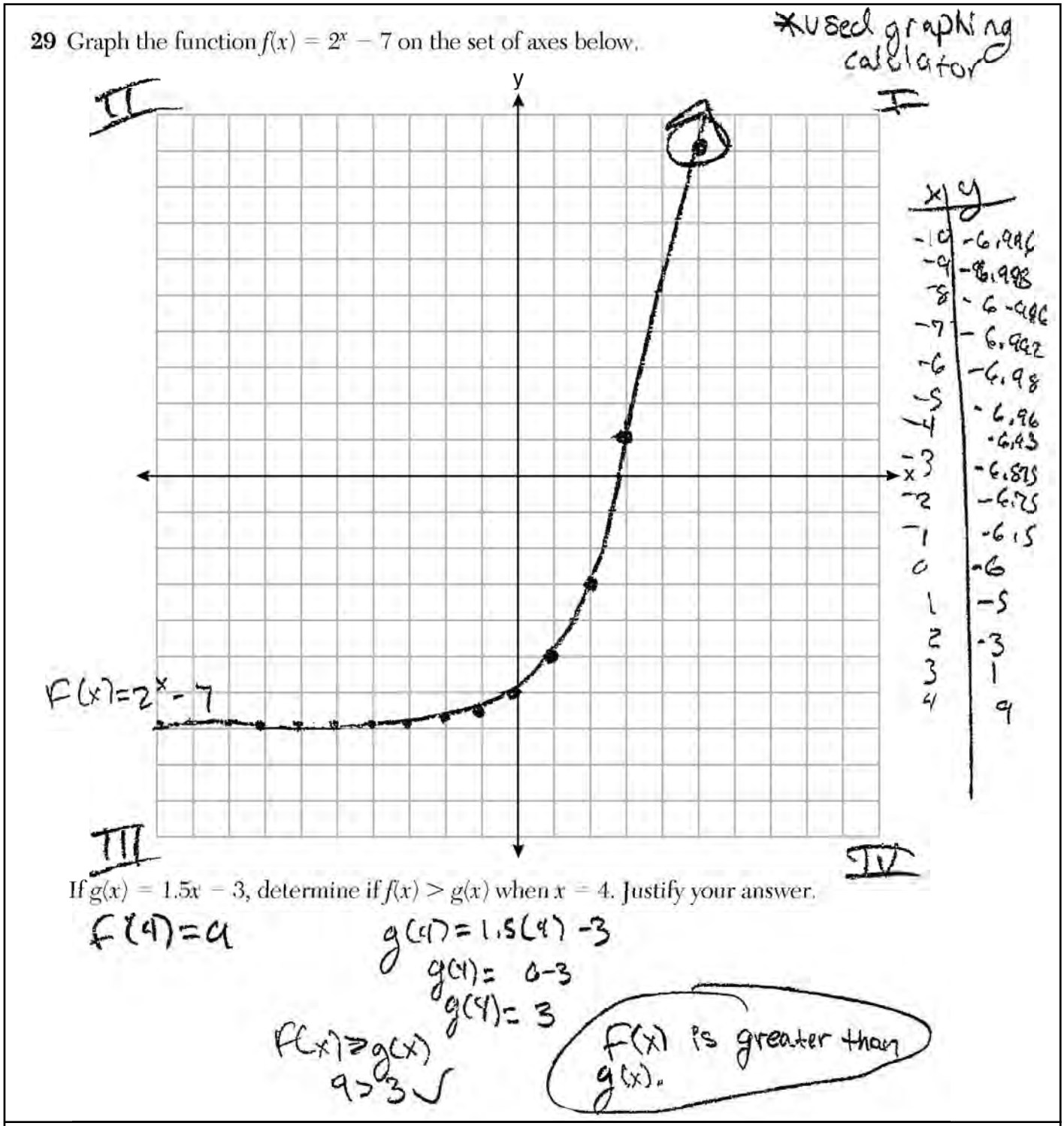
$f(4) = 2^4 - 7 = 9$

$g(4) = 1.5(4) - 3 = 3$

when x is 4
$f(x) > g(x)$

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

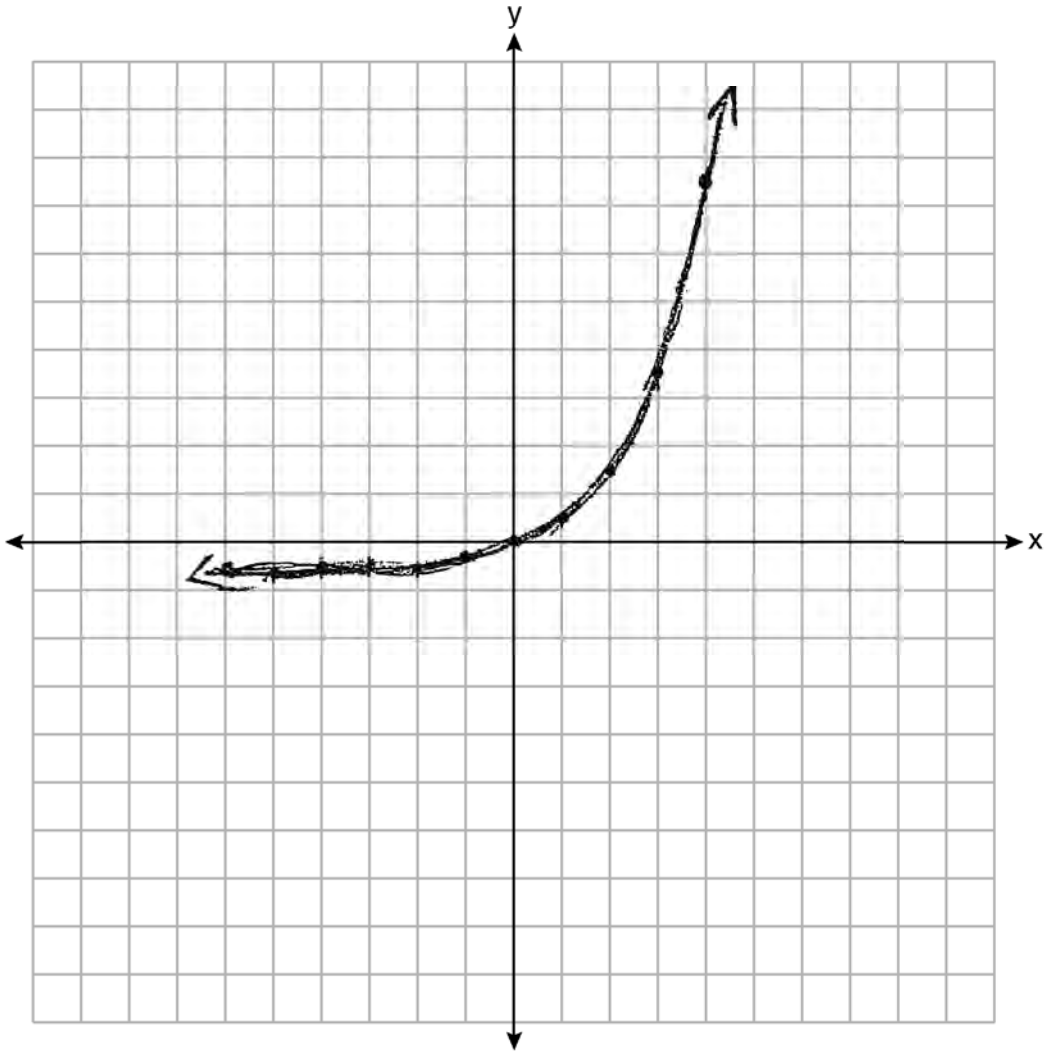
Question 29



Score 1: The student made one error by graphing (5,9).

Question 29

29 Graph the function $f(x) = 2^x - 7$ on the set of axes below.



If $g(x) = 1.5x - 3$, determine if $f(x) > g(x)$ when $x = 4$. Justify your answer.

$g(x) = 1.5x - 3$

$f(x) > g(x)$ $x = 4$

$g(x) = 1.5x - 3$
$g(x) = 1.5(4) - 3$
$g(x) = 6 - 3$
$g(x) = 3$

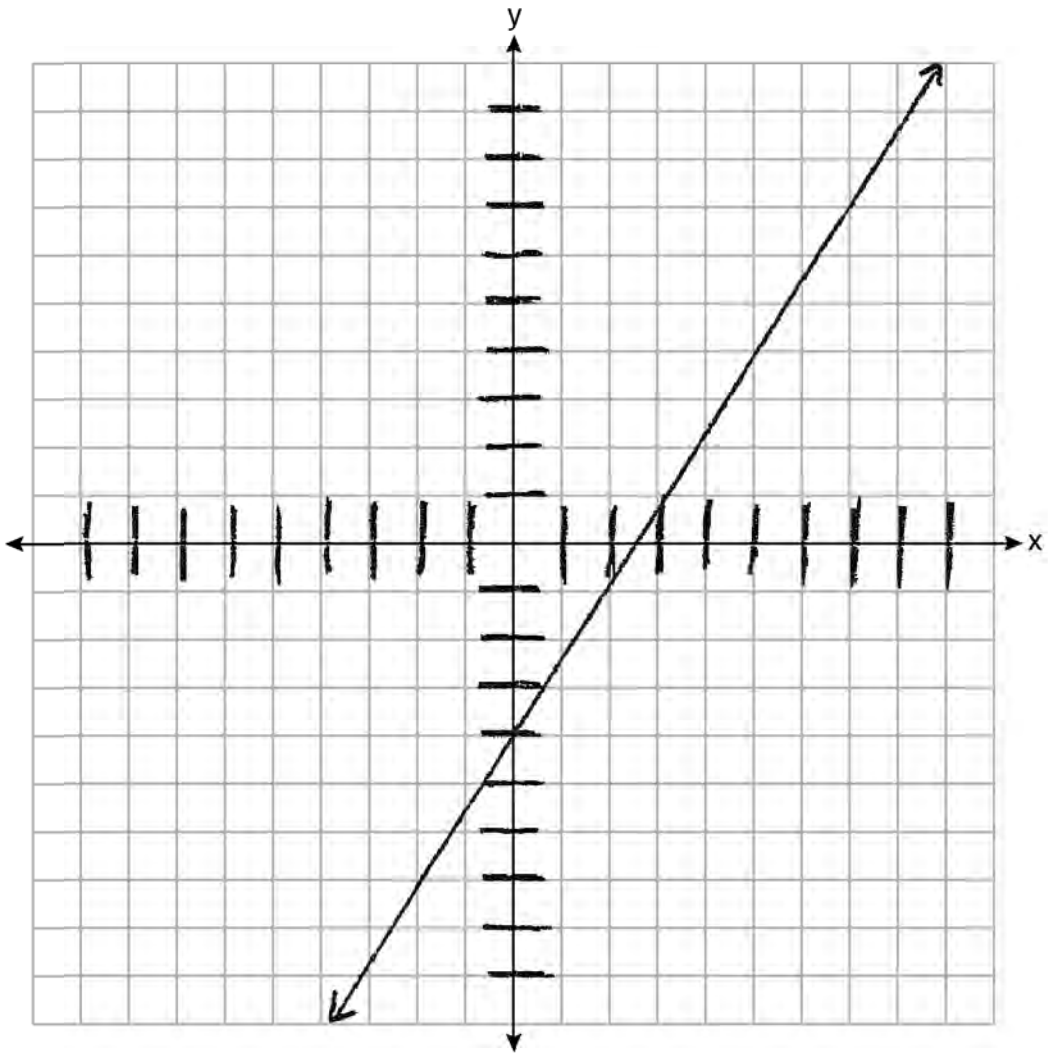
$f(x) = 2^x - 7$
$f(x) = 2^4 - 7$
$f(x) = 9$

The statement is true that when $x = 4$ $f(x)$ is greater than $g(x)$. This is because when x is substituted by 4 in each equation, $f(x)$ has the greater value of 9 while $g(x)$ has the lesser value of 3.

Score 1: The student graphed $f(x)$ incorrectly, but gave a correct justification.

Question 29

29 Graph the function $f(x) = 2^x - 7$ on the set of axes below.



If $g(x) = 1.5x - 3$, determine if $f(x) > g(x)$ when $x = 4$. Justify your answer.

$1.5(4)-3$ 2^4-7

3 9

9 > 3

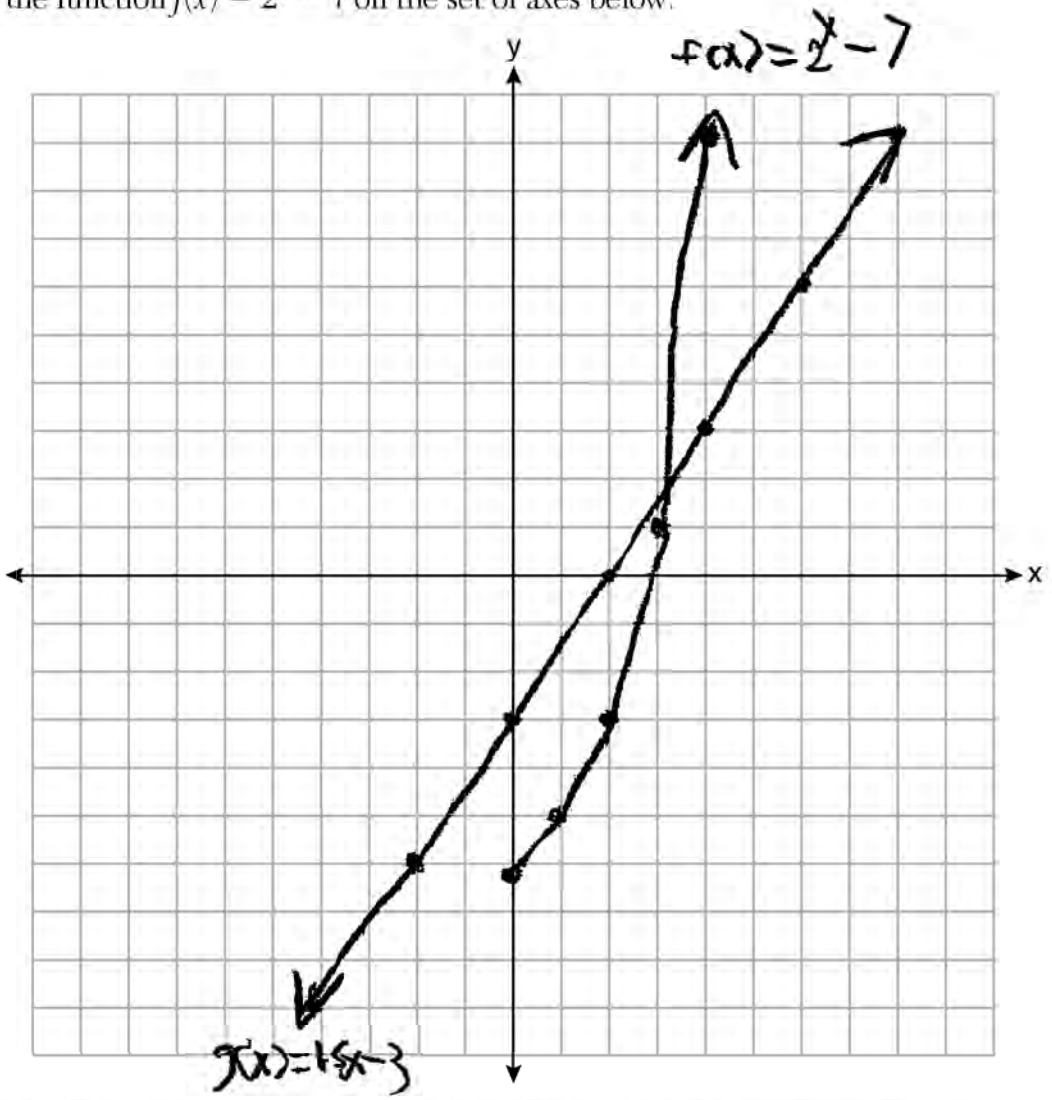
Yes 9 > 3

(9 is greater than 3)

Score 1: The student gave a correct justification.

Question 29

29 Graph the function $f(x) = 2^x - 7$ on the set of axes below.



If $g(x) = 1.5x - 3$, determine if $f(x) > g(x)$ when $x = 4$. Justify your answer.

yes because f(x) is exponential.

Score 0: The student graphed $f(x)$ for $x \geq 0$ and gave an incomplete justification.

Question 30

30 Determine algebraically the zeros of $f(x) = 3x^3 + 21x^2 + 36x$.

roots

Set equal to zero

$0 = 3x^3 + 21x^2 + 36x$

$0 = 3x(x^2 + 7x + 12)$ $\frac{*12}{4,3}$ $+7$

$0 = 3x(x+4)(x+3)$

$3x = 0$	$x+4=0$	$x+3=0$
$\frac{3x}{3} = \frac{0}{3}$	$-4 \quad -4$	$-3 \quad -3$
$x = 0$	$x = -4$	$x = -3$

The zeros are 0, -4, and -3.

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

Question 30

30 Determine algebraically the zeros of $f(x) = 3x^3 + 21x^2 + 36x$.

$0 = 3x(x^2 + 7x + 12)$

$0 = x^2 + 7x + 12$

$(x + 3)(x + 4)$

$x + 3 = 0 \quad x + 4 = 0$

$-3 \quad -3 \quad -4 \quad -4$

$x = -3 \quad x = -4$

$\{-3, -4\}$

Score 1: The student did not continue to include $3x$ when factoring the trinomial completely.

Question 30

30 Determine algebraically the zeros of $f(x) = 3x^3 + 21x^2 + 36x$.

a b c

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

$$x = \frac{-21 \pm \sqrt{441 - 432}}{6}$$

$$x = \frac{-21 \pm \sqrt{9}}{6}$$

$$x = \frac{-21 \pm 3}{6}$$

$$x = \frac{-24}{6} \qquad x = \frac{-18}{6}$$

Score 1: The student made a conceptual error by using the quadratic formula on a cubic equation.

Question 30

30 Determine algebraically the zeros of $f(x) = 3x^3 + 21x^2 + 36x$.

$x(3x^2+21x+36)$

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

Question 31

31 Santina is considering a vacation and has obtained high-temperature data from the last two weeks for Miami and Los Angeles.

Miami	76	75	83	73	60	66	76
	81	83	85	83	87	80	80

7.22523

Los Angeles	74	63	65	67	65	65	65
	62	62	72	69	64	64	61

3.639

Which location has the least variability in temperatures? Explain how you arrived at your answer.

Los Angeles; The standard deviation for LA is 3.64 (rounded) while the standard deviation for Miami is 7.23. (rounded)

$3.64 < 7.23$

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

Question 31

31 Santina is considering a vacation and has obtained high-temperature data from the last two weeks for Miami and Los Angeles.

Miami	76	75	83	73	60	66	76
	81	83	85	83	87	80	80

27 range

Los Angeles	74	63	65	67	65	65	65
	62	62	72	69	64	64	61

74 - 61 = 13 range

Which location has the least variability in temperatures? Explain how you arrived at your answer.

~~60, 66, 73, 75, 76, 76, 80, 80, 81, 83, 83, 83~~

Los Angeles has more consistent temperatures I got this answer by finding the range of the data tables and I got 13 for the range for Los Angeles and 27 for the range in Miami

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

Question 31

31 Santina is considering a vacation and has obtained high-temperature data from the last two weeks for Miami and Los Angeles.

Miami	76	75	83	73	60	66	76
	81	83	85	83	87	80	80

Los Angeles	74	63	65	67	65	65	65
	62	62	72	69	64	64	61

Which location has the least variability in temperatures? Explain how you arrived at your answer.

Los Angeles

Q1 = 63

Q3 = 67

IQR = 67 − 63 = 4

Miami

Q1 = 75

Q3 = 83

IQR = 83 − 75 = 8

Score 1: The student gave a justification and not an explanation.

Question 31

31 Santina is considering a vacation and has obtained high-temperature data from the last two weeks for Miami and Los Angeles.

Miami	76	75	83	73	60	66	76
	81	83	85	83	87	80	80

87 - 60 = 27°

Los Angeles	74	63	65	67	65	65	65
	62	62	72	69	64	64	61

72 - 61 = 11°

Which location has the least variability in temperatures? Explain how you arrived at your answer.

LA, they're closer.

Score 0: The student made an error calculating the range for Los Angeles and wrote an incomplete explanation.

Question 32

32 Solve the quadratic equation below for the exact values of x.

$4x^2 - 5 = 75$

$+5 \quad +5$

$\frac{4x^2}{4} = \frac{80}{4}$

$\sqrt{x^2} = \sqrt{20}$

$x = \pm\sqrt{20}$

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

Question 32

32 Solve the quadratic equation below for the exact values of x.

$$4x^2 - 5 = 75$$

$4x^2 - 80 = 0$

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

$x = \frac{-0 \pm \sqrt{(0)^2 - 4(4)(-80)}}{2(4)}$

$x = \frac{0 \pm \sqrt{0 + 1280}}{8}$

$x = \frac{0 \pm \sqrt{1280}}{8}$

$x = \frac{+\sqrt{1280}}{8}$ $\quad x = \frac{-\sqrt{1280}}{8}$

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

Question 32

32 Solve the quadratic equation below for the exact values of x.

$4x^2 - 5 = 75$

$+5 \quad +5$

$\frac{4x^2}{4} = \frac{80}{4}$

$\sqrt{x^2} = \sqrt{20}$

$x = \pm 4.472135955$

Score 1: The student wrote their final answer as a decimal.

Question 32

32 Solve the quadratic equation below for the exact values of x.

$4x^2 - 5 = 75$

$a = 4$

$b = -5$

$c = 75$

$$x = \frac{-5 \pm \sqrt{-5^2 - 4(4)(75)}}{2(4)}$$

$$x = \frac{-5 \pm \sqrt{-5^2 - 1200}}{8}$$

$$x = \frac{-5 \pm \sqrt{-1225}}{8}$$

$$x = -5 \pm \sqrt{-153.125}$$

$$x = -7.37436867$$

Score 0: The student made multiple errors.

Question 33

33 Marilyn collects old dolls. She purchases a doll for $450. Research shows this doll's value will increase by 2.5% each year.

Write an equation that determines the value, V, of the doll t years after purchase.

$V = 450(0.025+1)^t$

Assuming the doll's rate of appreciation remains the same, will the doll's value be doubled in 20 years? Justify your reasoning.

$V = 450(0.025+1)^{20}$

$V = \$737.38$

$450 \times 2 = \$900$

No, the value of the doll after 20 years is $737.38 not $900, which is the double of $450, the original price.

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

Question 33

33 Marilyn collects old dolls. She purchases a doll for $450. Research shows this doll's value will increase by 2.5% each year.

Write an equation that determines the value, V, of the doll t years after purchase.

$V(t) = 450\ (1.025)^t$

Assuming the doll's rate of appreciation remains the same, will the doll's value be doubled in 20 years? Justify your reasoning.

$V(t) = 450\ (1.025)^{20}$

$= 737.3773981$

$737.38 < 2(450)$

$737.38 < 900$

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

Question 33

33 Marilyn collects old dolls. She purchases a doll for $450. Research shows this doll's value will increase by 2.5% each year.

Write an equation that determines the value, V, of the doll t years after purchase.

1+.025

$y = 450(1.025)^{*}$

Assuming the doll's rate of appreciation remains the same, will the doll's value be doubled in 20 years? Justify your reasoning.

$y = 450(1.025)^{20}$

No in 20 years it will be $737.38 which isn't doubled.

Score 3: The student did not write the equation in terms of V and t.

Question 33

33 Marilyn collects old dolls. She purchases a doll for $450. Research shows this doll's value will increase by 2.5% each year.

Write an equation that determines the value, V, of the doll t years after purchase.

$Y = 450(1+.0025)^x$

Assuming the doll's rate of appreciation remains the same, will the doll's value be doubled in 20 years? Justify your reasoning.

$Y = 450(1+.0025)^{20}$

NO. It will be worth $473.04

Score 2: The student wrote an incorrect equation, but gave an appropriate justification.

Question 33

33 Marilyn collects old dolls. She purchases a doll for $450. Research shows this doll's value will increase by 2.5% each year.

Write an equation that determines the value, V, of the doll t years after purchase.

$A = P(1+r)^t$

$A = 450(1 + 0.025)^t$

$A = 450(1.025)^t$

$A = 461.25$. The value of V is 461.25$

Assuming the doll's rate of appreciation remains the same, will the doll's value be doubled in 20 years? Justify your reasoning.

$A = 450(1 + 0.025)^{20}$

$A = 450(2.025)^{20}$

$A = 450(1.6386164)$

$A = 737.37$$

Yes the vale will be doubled in 20 years because in one the vale is 461.25 so how can in 20 years. the vale is 737.37$ cause it got increase.

Score 1: The student did not write the equation in terms of V, rounded incorrectly, and gave an incorrect justification.

Question 33

33 Marilyn collects old dolls. She purchases a doll for $450. Research shows this doll's value will increase by 2.5% each year.

Write an equation that determines the value, V, of the doll t years after purchase.

$450(1+.0025)^{X}$

Assuming the doll's rate of appreciation remains the same, will the doll's value be doubled in 20 years? Justify your reasoning.

$450(1+.0025)^{20}$

Score 0: The student made multiple errors.

Question 34

34 The data given in the table below show some of the results of a study comparing the height of a certain breed of dog, based upon its mass.

Mass (kg)	4.5	5	4	3.5	5.5	5	5	4	4	6	3.5	5.5
Height (cm)	41	40	35	38	43	44	37	39	42	44	31	30

Write the linear regression equation for these data, where x is the mass and y is the height. Round all values to the *nearest tenth*.

$y = 1.9x + 29.8$

State the value of the correlation coefficient to the *nearest tenth*, and explain what it indicates.

$r = .3$ It is a positive weak correlation.

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

Question 34

34 The data given in the table below show some of the results of a study comparing the height of a certain breed of dog, based upon its mass.

Mass (kg)	4.5	5	4	3.5	5.5	5	5	4	4	6	3.5	5.5
Height (cm)	41	40	35	38	43	44	37	39	42	44	31	30

Write the linear regression equation for these data, where x is the mass and y is the height. Round all values to the *nearest tenth*.

$f(x) = 1.9x + 29.8$

State the value of the correlation coefficient to the *nearest tenth*, and explain what it indicates.

.3 it indicates that there is not a strong correlation

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

Question 34

34 The data given in the table below show some of the results of a study comparing the height of a certain breed of dog, based upon its mass.

Mass (kg)	4.5	5	4	3.5	5.5	5	5	4	4	6	3.5	5.5
Height (cm)	41	40	35	38	43	44	37	39	42	44	31	30

Write the linear regression equation for these data, where x is the mass and y is the height. Round all values to the *nearest tenth*.

$y = 1.9x + 29.8$

State the value of the correlation coefficient to the *nearest tenth*, and explain what it indicates.

$r = .3$

This means that this data is not strong

Score 3: The student indicated that the data were weak, not the correlation coefficient.

Question 34

34 The data given in the table below show some of the results of a study comparing the height of a certain breed of dog, based upon its mass.

Mass (kg)	4.5	5	4	3.5	5.5	5	5	4	4	6	3.5	5.5
Height (cm)	41	40	35	38	43	44	37	39	42	44	31	30

Write the linear regression equation for these data, where x is the mass and y is the height. Round all values to the *nearest tenth*.

$y = 29.8 + 1.9x$

State the value of the correlation coefficient to the *nearest tenth*, and explain what it indicates.

The correlation coefficient is 1.917x, which represents the correlation between the different heights and weights of each dog.

Score 2: The student wrote a correct equation.

Question 34

34 The data given in the table below show some of the results of a study comparing the height of a certain breed of dog, based upon its mass.

Mass (kg)	4.5	5	4	3.5	5.5	5	5	4	4	6	3.5	5.5
Height (cm)	41	40	35	38	43	44	37	39	42	44	31	30

Write the linear regression equation for these data, where x is the mass and y is the height. Round all values to the *nearest tenth*.

r=0.33/70915809

State the value of the correlation coefficient to the *nearest tenth*, and explain what it indicates.

r=0.3

This indicates the increase in mass and height.

Score 1: The student wrote a correct correlation coefficient.

Question 34

34 The data given in the table below show some of the results of a study comparing the height of a certain breed of dog, based upon its mass.

Mass (kg)	4.5	5	4	3.5	5.5	5	5	4	4	6	3.5	5.5
Height (cm)	41	40	35	38	43	44	37	39	42	44	31	30

Write the linear regression equation for these data, where x is the mass and y is the height. Round all values to the *nearest tenth*.

$y=3x+.5$

State the value of the correlation coefficient to the *nearest tenth*, and explain what it indicates.

The correlation coefficient is 3. It means that when the mass is 3kg the height is .5cm.

Score 0: The student showed no correct work.

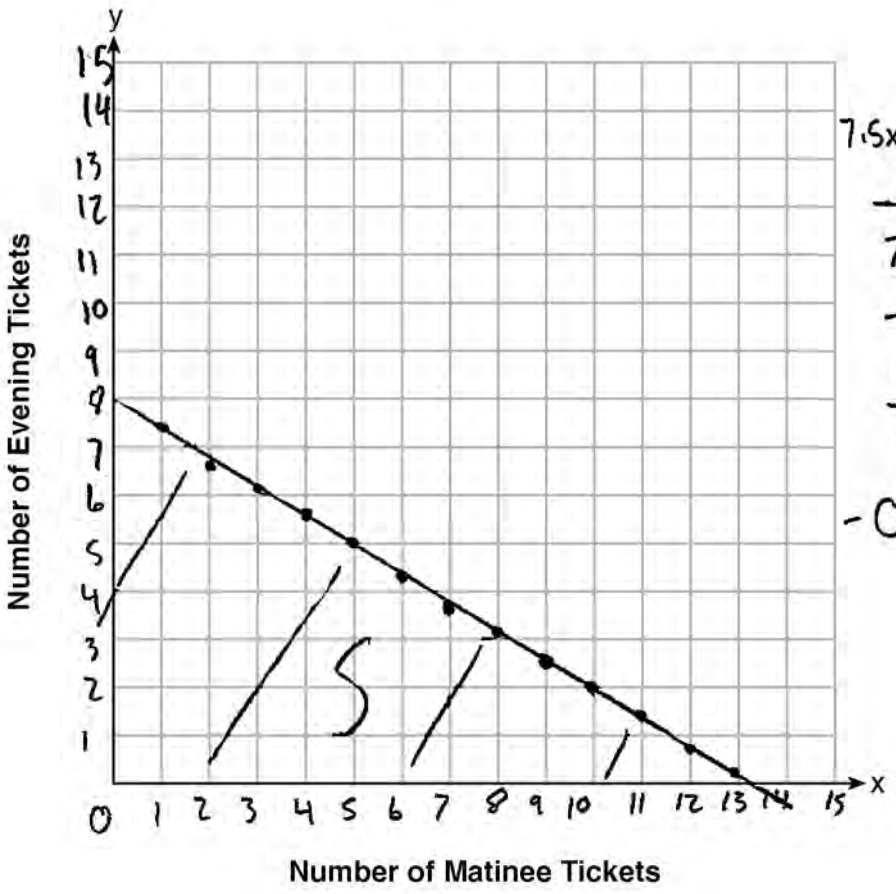
Question 35

35 Myranda received a movie gift card for \$100 to her local theater. Matinee tickets cost \$7.50 each and evening tickets cost \$12.50 each.

If x represents the number of matinee tickets she could purchase, and y represents the number of evening tickets she could purchase, write an inequality that represents all the possible ways Myranda could spend her gift card on movies at the theater.

$7.5x + 12.50y \leq 100$

On the set of axes below, graph this inequality.



$7.5x + 12.50y \leq 100$
$-12.50y$
$7.5x \leq 100 - 12.50y$
-100
$7.5x - 100 \leq -12.50y$
$-12.50 \quad -12.50$
$-0.6x + 8 \geq y$

What is the maximum number of matinee tickets Myranda could purchase with her gift card? Explain your answer.

13, if you do 100 ÷ 7.50 you get $13.\overline{3}$ and you round down to the nearest whole number you get 13

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

Question 35

35 Myranda received a movie gift card for \$100 to her local theater. Matinee tickets cost \$7.50 each and evening tickets cost \$12.50 each.

If x represents the number of matinee tickets she could purchase, and y represents the number of evening tickets she could purchase, write an inequality that represents all the possible ways Myranda could spend her gift card on movies at the theater.

$100 \geq 7.50x + 12.50y$

On the set of axes below, graph this inequality.

$100 \geq 7.50x + 12.50y$

x-intercept $y=0$

$100 \geq 7.50x + 12.50y$

$100 \geq 7.50x + 12.50(0)$

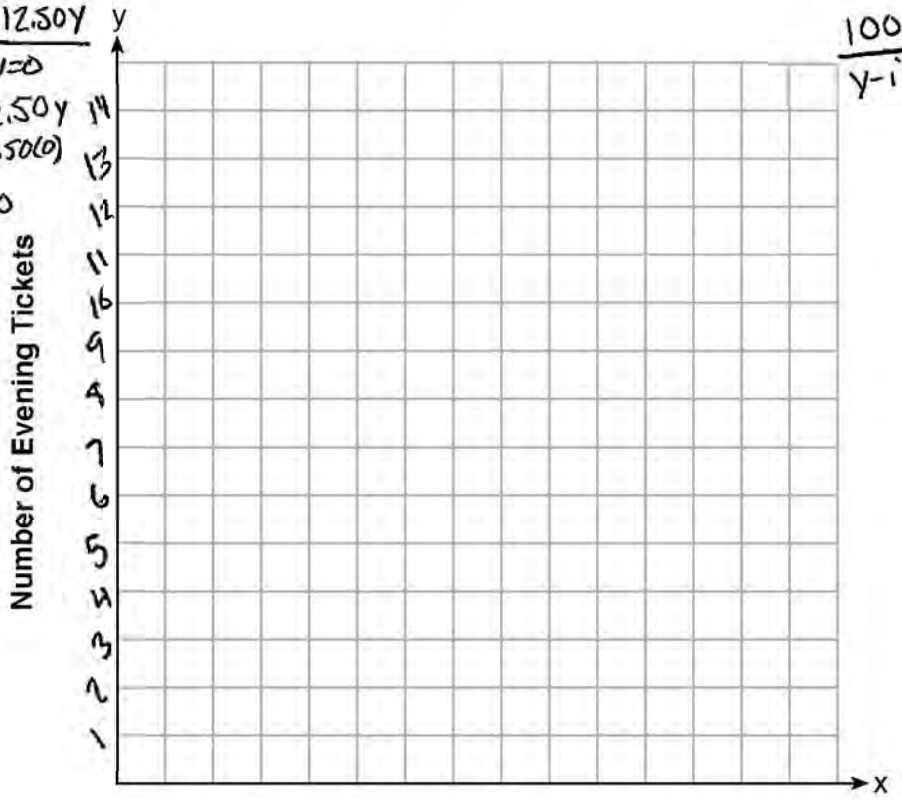
$100 \geq 7.50x + 0$

$\frac{100}{7.50} \geq \frac{7.50x}{7.50}$

$13.\overline{3} \geq x$

$100 \geq 7.50x + 12.50y$

y-int



Number of Matinee Tickets

What is the maximum number of matinee tickets Myranda could purchase with her gift card? Explain your answer.

since the x-intercept is $13.\overline{3}$, the greatest number of matinee tickets is 13.

Score 3: The student did not graph the inequality.

Question 35

35 Myranda received a movie gift card for \$100 to her local theater. Matinee tickets cost \$7.50 each and evening tickets cost \$12.50 each.

If x represents the number of matinee tickets she could purchase, and y represents the number of evening tickets she could purchase, write an inequality that represents all the possible ways Myranda could spend her gift card on movies at the theater.

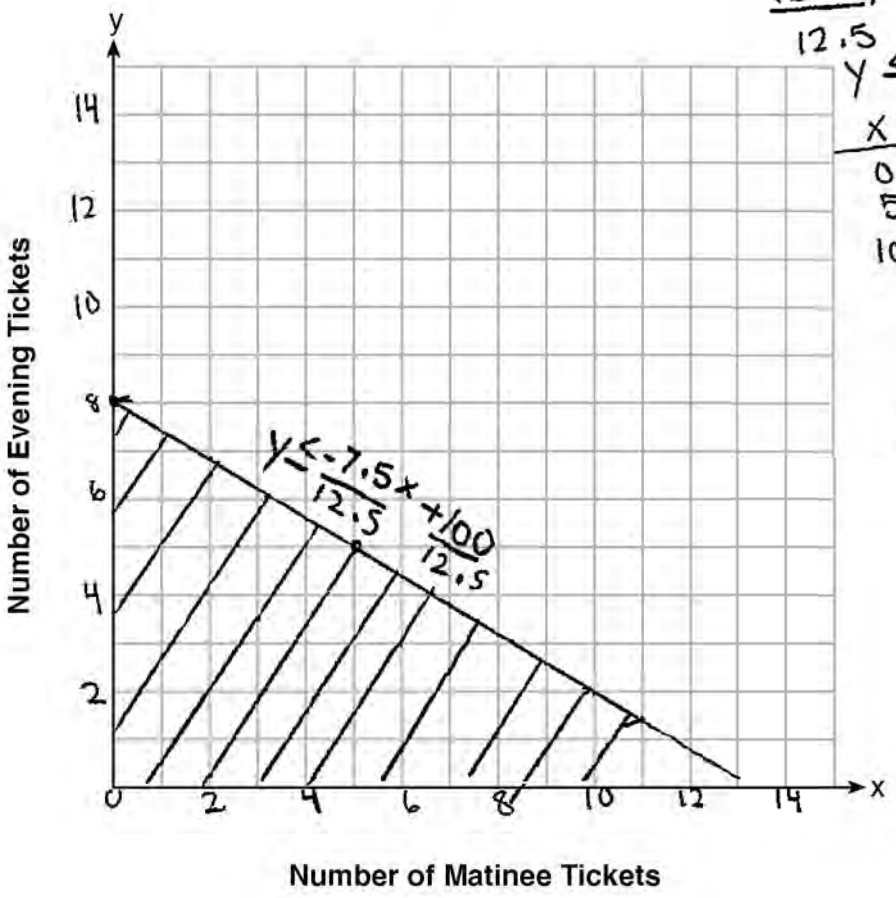
$7.50x + 12.50y \leq 100$

$\frac{12.5y}{12.5} \leq \frac{-7.50x + 100}{12.5}$ 12.5

$y \leq \frac{-7.5}{12.5}x + \frac{100}{12.5}$

x	y
0	8
5	5
10	2

On the set of axes below, graph this inequality.



What is the maximum number of matinee tickets Myranda could purchase with her gift card? Explain your answer.

maximum = 10 matinee tickets.
the graph is going from evening to matinee & is decreasing so the max she can buy is 10

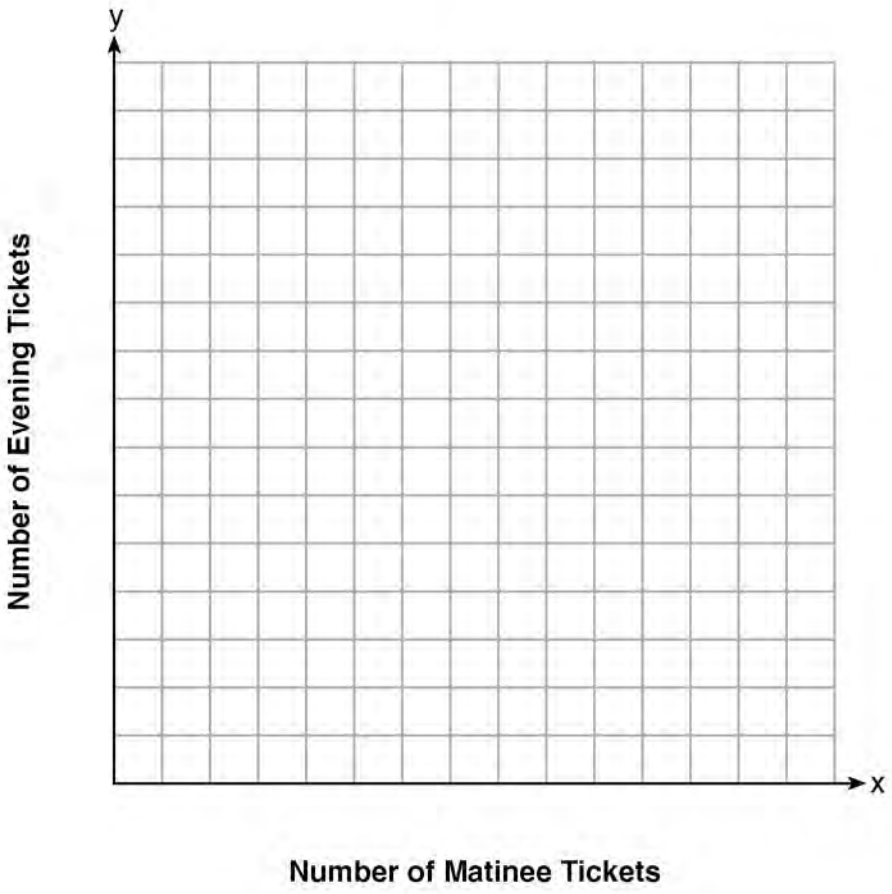
Score 2: The student wrote a correct inequality and graphed it correctly.

Question 35

35 Myranda received a movie gift card for $100 to her local theater. Matinee tickets cost $7.50 each and evening tickets cost $12.50 each.

If x represents the number of matinee tickets she could purchase, and y represents the number of evening tickets she could purchase, write an inequality that represents all the possible ways Myranda could spend her gift card on movies at the theater.

On the set of axes below, graph this inequality.



What is the maximum number of matinee tickets Myranda could purchase with her gift card? Explain your answer.

$\frac{100}{7.50} = 13.\overline{3}$ (13)

Score 1: The student wrote 13 and gave a justification, not an explanation.

Question 35

35 Myranda received a movie gift card for \$100 to her local theater. Matinee tickets cost \$7.50 each and evening tickets cost \$12.50 each.

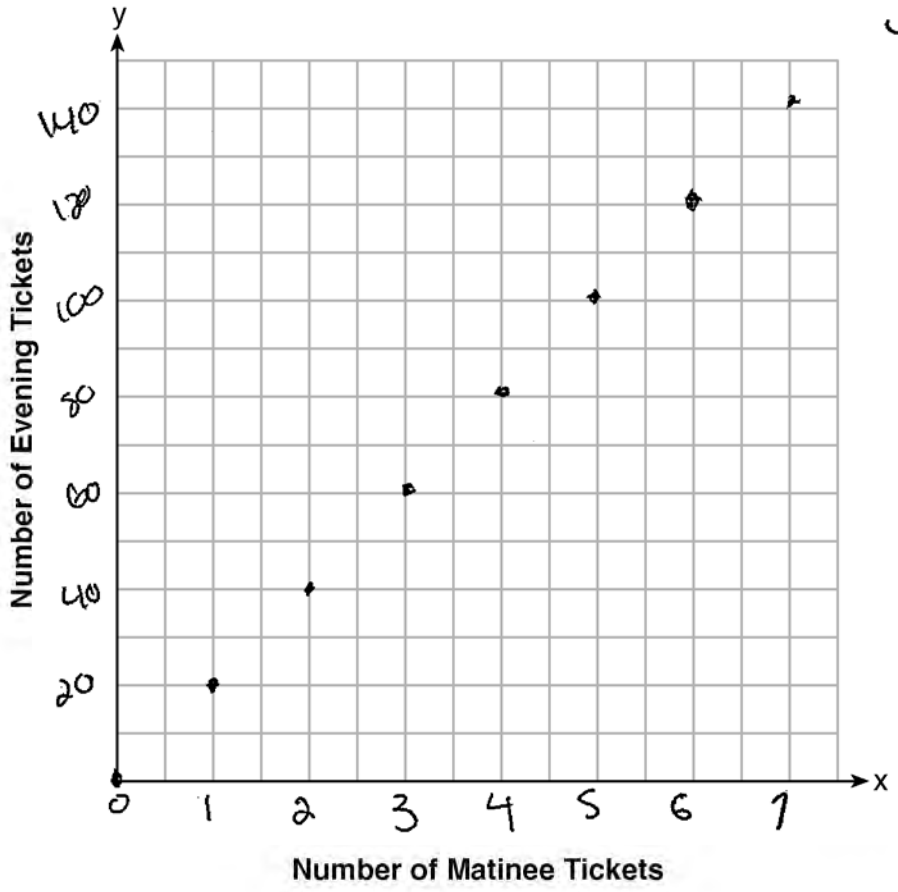
If x represents the number of matinee tickets she could purchase, and y represents the number of evening tickets she could purchase, write an inequality that represents all the possible ways Myranda could spend her gift card on movies at the theater.

$7.50x + 12.50y$

On the set of axes below, graph this inequality.

up 20

X	Y
0	0
1	20
2	40
3	60
4	80
5	100
6	120
7	140



What is the maximum number of matinee tickets Myranda could purchase with her gift card? Explain your answer.

140

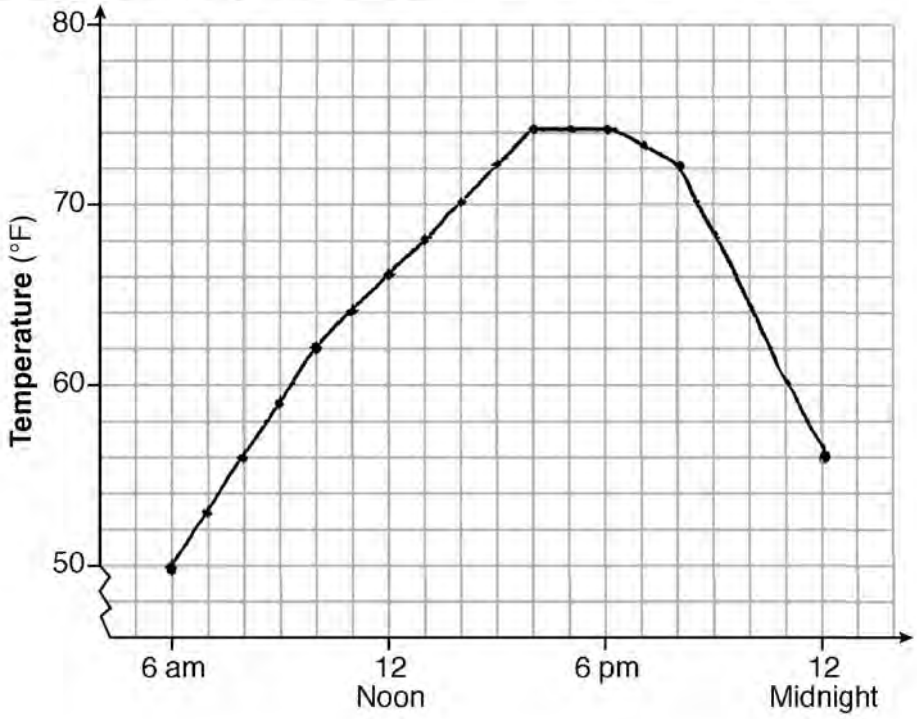
Score 0: The student did not show enough work to receive any credit.

Question 36

36 One spring day, Elroy noted the time of day and the temperature, in degrees Fahrenheit. His findings are stated below.

At 6 a.m., the temperature was 50°F. For the next 4 hours, the temperature rose 3° per hour.
The next 6 hours, it rose 2° per hour.
The temperature then stayed steady until 6 p.m.
For the next 2 hours, the temperature dropped 1° per hour.
The temperature then dropped steadily until the temperature was 56°F at midnight.

On the set of axes below, graph Elroy's data.



State the entire time interval for which the temperature was increasing.

(6 am, 4 pm)

Determine the average rate of change, in degrees per hour, from 6:00 p.m. to midnight.

$\frac{74-56}{6-12}$ $\frac{18}{-6}=-3$ $-3°/\text{hour}$

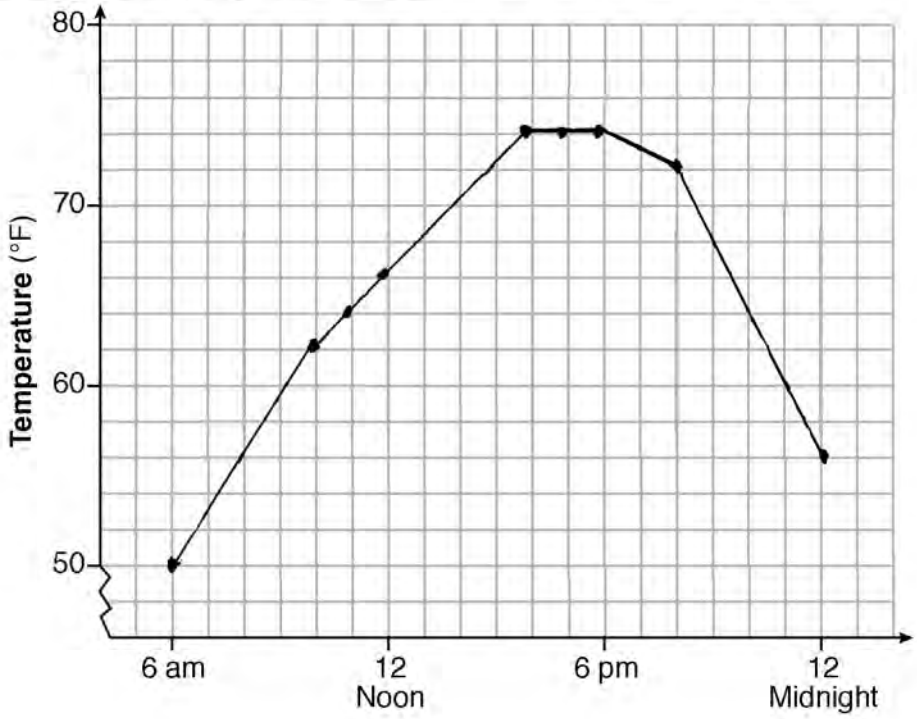
Score 4: The student gave a complete and correct response.

Question 36

36 One spring day, Elroy noted the time of day and the temperature, in degrees Fahrenheit. His findings are stated below.

At 6 a.m., the temperature was 50°F. For the next 4 hours, the temperature rose 3° per hour.
The next 6 hours, it rose 2° per hour.
The temperature then stayed steady until 6 p.m.
For the next 2 hours, the temperature dropped 1° per hour.
The temperature then dropped steadily until the temperature was 56°F at midnight.

On the set of axes below, graph Elroy's data.



State the entire time interval for which the temperature was increasing.

The temperature was increasing from 6:00 am – 6:00 pm

Determine the average rate of change, in degrees per hour, from 6:00 p.m. to midnight.

$\frac{74-56}{6-12} = \frac{18}{-6} = -3$ The average rate of change for this period was −3°/hour.

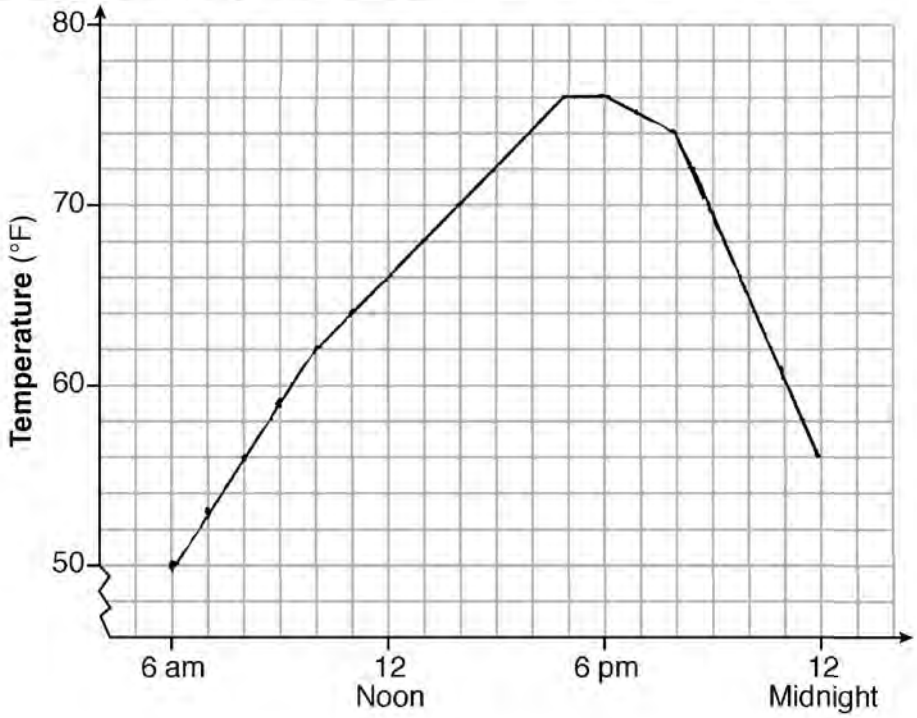
Score 3: The student stated an incorrect time interval.

Question 36

36 One spring day, Elroy noted the time of day and the temperature, in degrees Fahrenheit. His findings are stated below.

At 6 a.m., the temperature was 50°F. For the next 4 hours, the temperature rose 3° per hour.
The next 6 hours, it rose 2° per hour.
The temperature then stayed steady until 6 p.m.
For the next 2 hours, the temperature dropped 1° per hour.
The temperature then dropped steadily until the temperature was 56°F at midnight.

On the set of axes below, graph Elroy's data.



State the entire time interval for which the temperature was increasing.

6am ≤ X ≤ 4pm

Determine the average rate of change, in degrees per hour, from 6:00 p.m. to midnight.

4°F

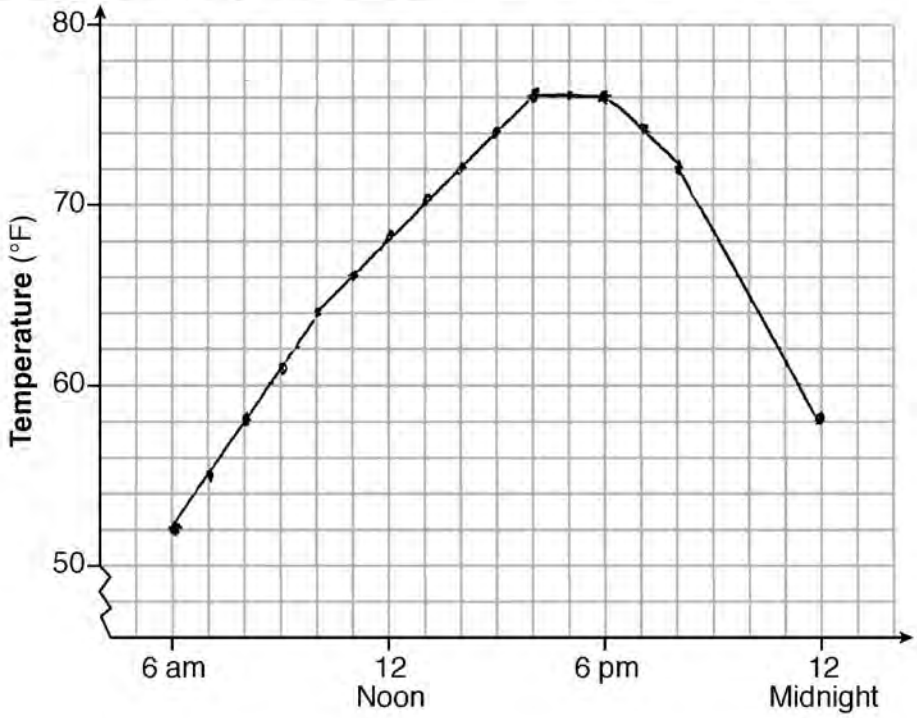
Score 2: The student graphed a rate of change of 2° per hour for 7 hours instead of 6, but stated a correct interval based on the information given in the problem.

Question 36

36 One spring day, Elroy noted the time of day and the temperature, in degrees Fahrenheit. His findings are stated below.

At 6 a.m., the temperature was 50°F. For the next 4 hours, the temperature rose 3° per hour.
The next 6 hours, it rose 2° per hour.
The temperature then stayed steady until 6 p.m.
For the next 2 hours, the temperature dropped 1° per hour.
The temperature then dropped steadily until the temperature was 56°F at midnight.

On the set of axes below, graph Elroy's data.



State the entire time interval for which the temperature was increasing.

6 am to 3pm

Determine the average rate of change, in degrees per hour, from 6:00 p.m. to midnight.

76 − 58 = 18
18 ÷ 6 = 3

average rate of change = −3

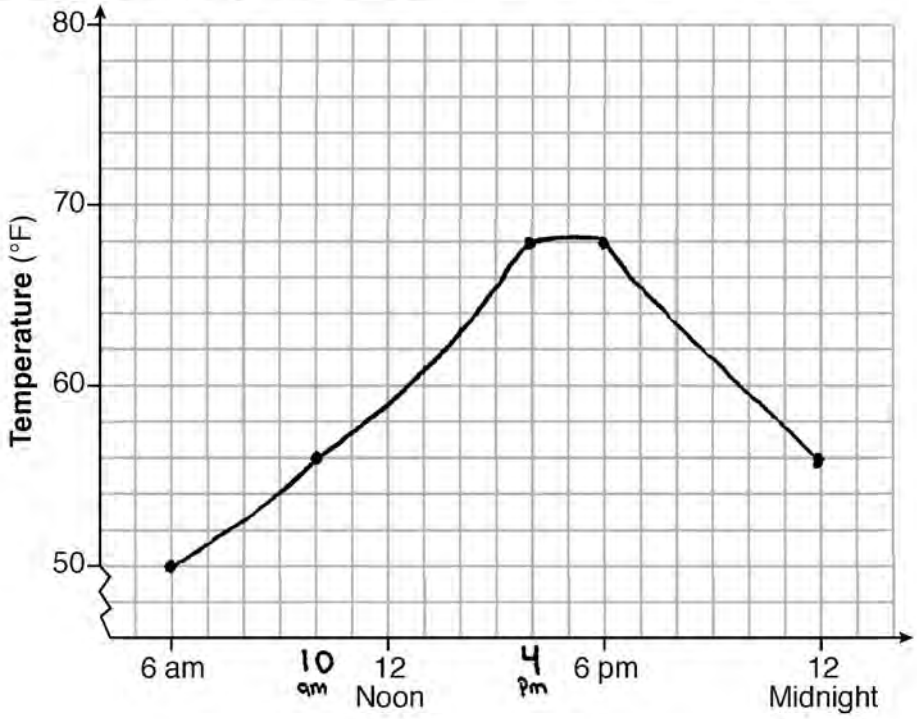
Score 1: The student made two graphing errors, but determined an appropriate rate of change.

Question 36

36 One spring day, Elroy noted the time of day and the temperature, in degrees Fahrenheit. His findings are stated below.

At 6 a.m., the temperature was 50°F. For the next 4 hours, the temperature rose 3° per hour.
The next 6 hours, it rose 2° per hour.
The temperature then stayed steady until 6 p.m.
For the next 2 hours, the temperature dropped 1° per hour.
The temperature then dropped steadily until the temperature was 56°F at midnight.

On the set of axes below, graph Elroy's data.



State the entire time interval for which the temperature was increasing.

Determine the average rate of change, in degrees per hour, from 6:00 p.m. to midnight.

It started to decrease from 6pm by 1° per hour until midnight

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

Question 37

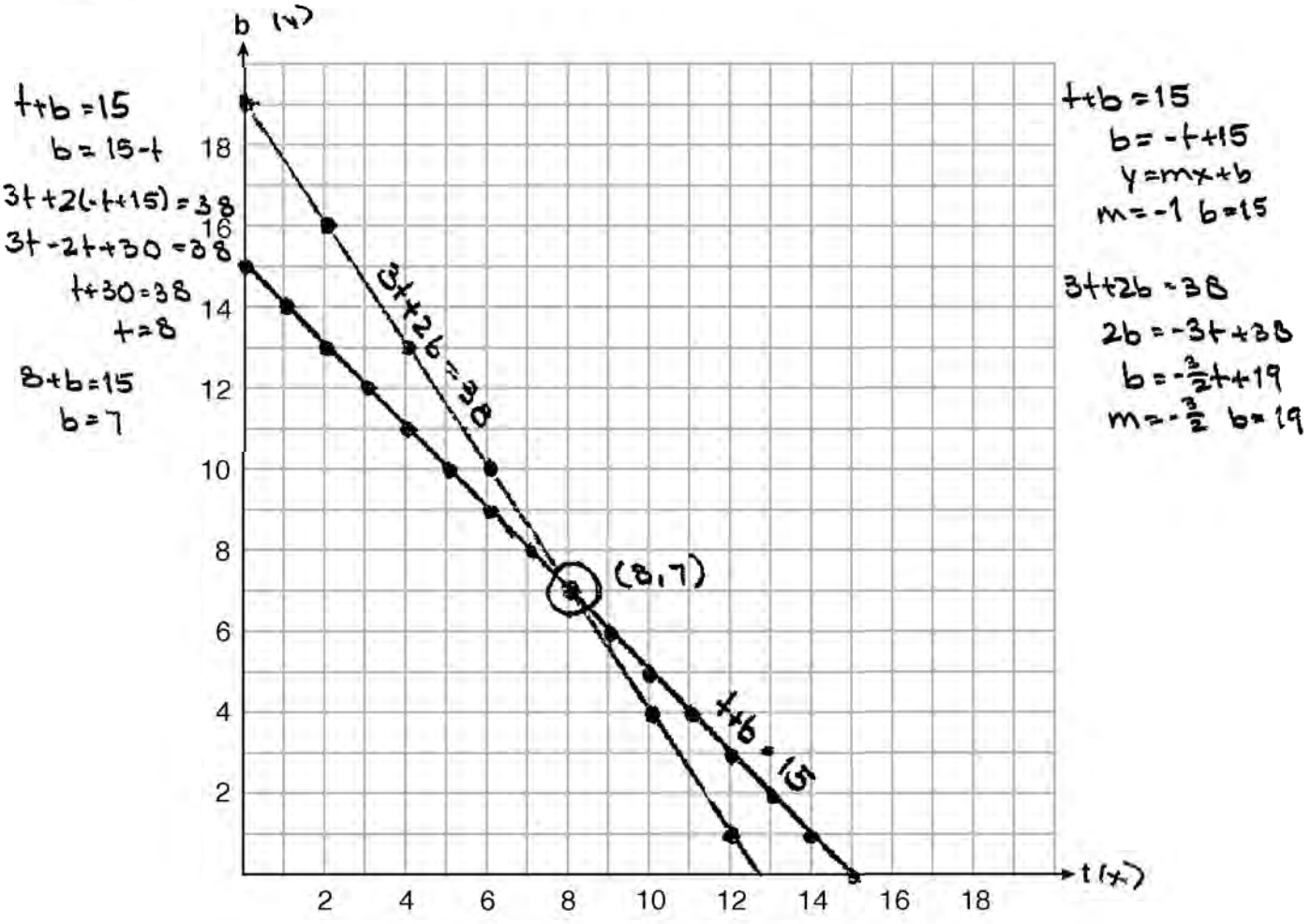
37 A recreation center ordered a total of 15 tricycles and bicycles from a sporting goods store. The number of wheels for all the tricycles and bicycles totaled 38.

Write a linear system of equations that models this scenario, where t represents the number of tricycles and b represents the number of bicycles ordered.

let: t = # of tricycles
b = # of bicycles

$t+b=15$
$3t+2b=38$

On the set of axes below, graph this system of equations.



Question 37 is continued on the next page.

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

Question 37 continued

Based on your graph of this scenario, could the recreation center have ordered 10 tricycles? Explain your reasoning.

No; the graphs do not intersect where t=10.

Question 37

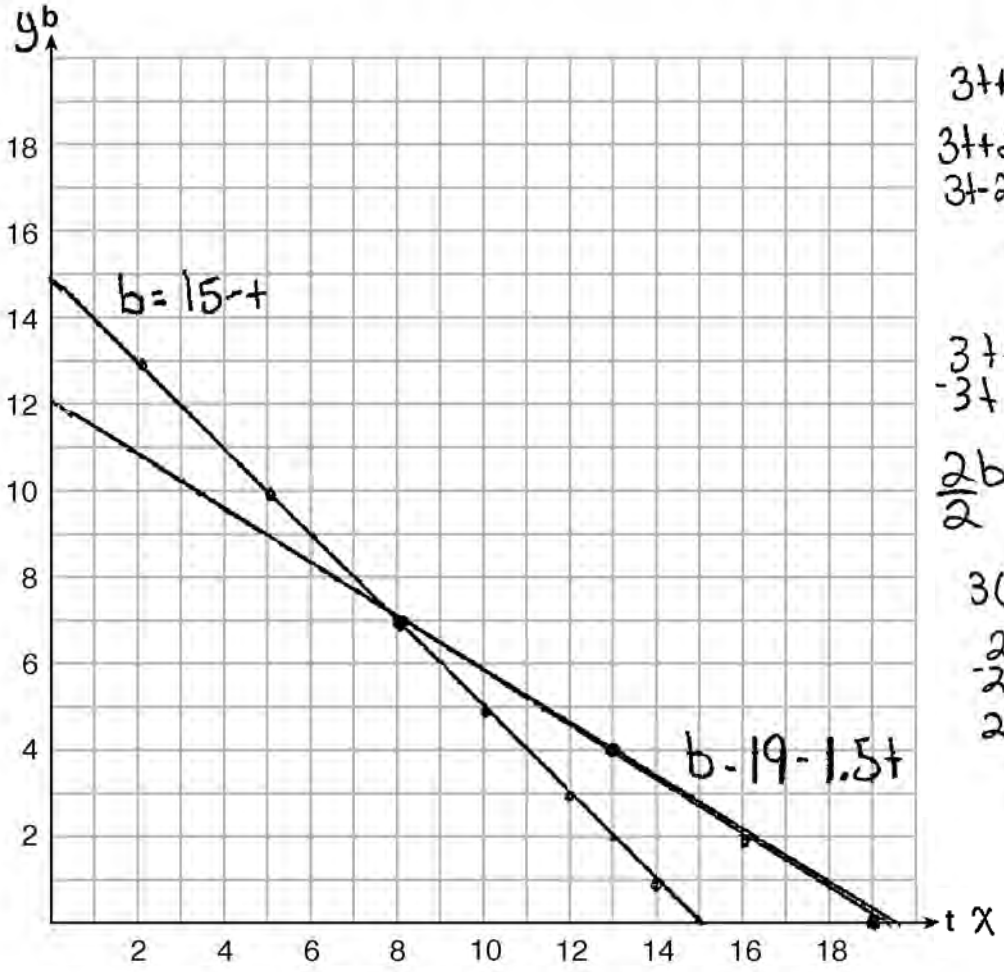
37 A recreation center ordered a total of 15 tricycles and bicycles from a sporting goods store. The number of wheels for all the tricycles and bicycles totaled 38.

Write a linear system of equations that models this scenario, where t represents the number of tricycles and b represents the number of bicycles ordered.

$t+b=15$

$3t+2b=38$

On the set of axes below, graph this system of equations.



$3t+2b=38$

$3t+2(t+15)=38$

$3t-2t+30=38$

$-30 \quad -30$

$t=8$

$3t+2b=38$

$-3t \quad -3t$

$\frac{2b}{2}=\frac{38-3t}{2}$

$3(8)+2b=38$

$24+2b=38$

$-24 \quad -24$

$2b=14$

$b=7$

Question 37 is continued on the next page.

Score 5: The student graphed $3t + 2b = 38$ incorrectly.

Question 37 continued

Based on your graph of this scenario, could the recreation center have ordered 10 tricycles? Explain your reasoning.

No, because the lines don't intersect at (10,5)

Question 37

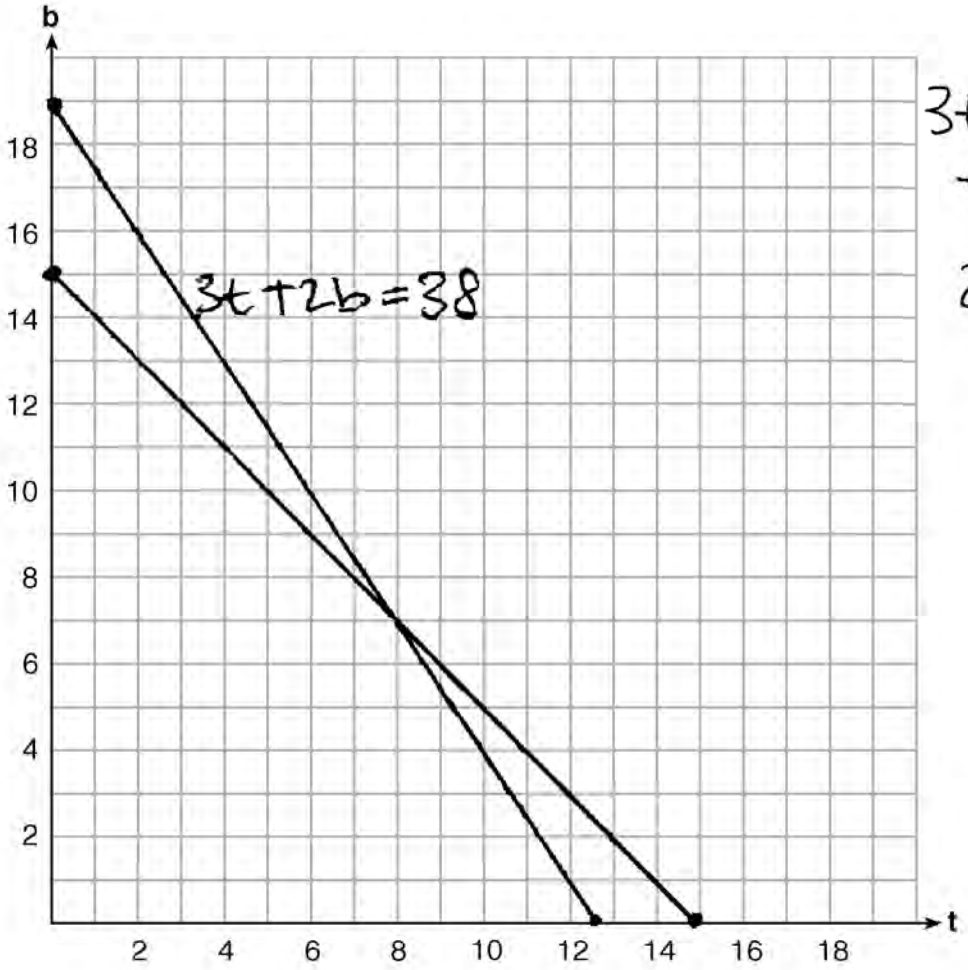
37 A recreation center ordered a total of 15 tricycles and bicycles from a sporting goods store. The number of wheels for all the tricycles and bicycles totaled 38.

Write a linear system of equations that models this scenario, where t represents the number of tricycles and b represents the number of bicycles ordered.

$t + b = 15$

$3t + 2b = 38$

On the set of axes below, graph this system of equations.



$3t = 38$

$t = 12.7$

$2b = 38$

$b = 19$

Question 37 is continued on the next page.

Score 4: The student wrote a correct system and graphed it correctly.

Question 37 continued

Based on your graph of this scenario, could the recreation center have ordered 10 tricycles? Explain your reasoning.

Question 37

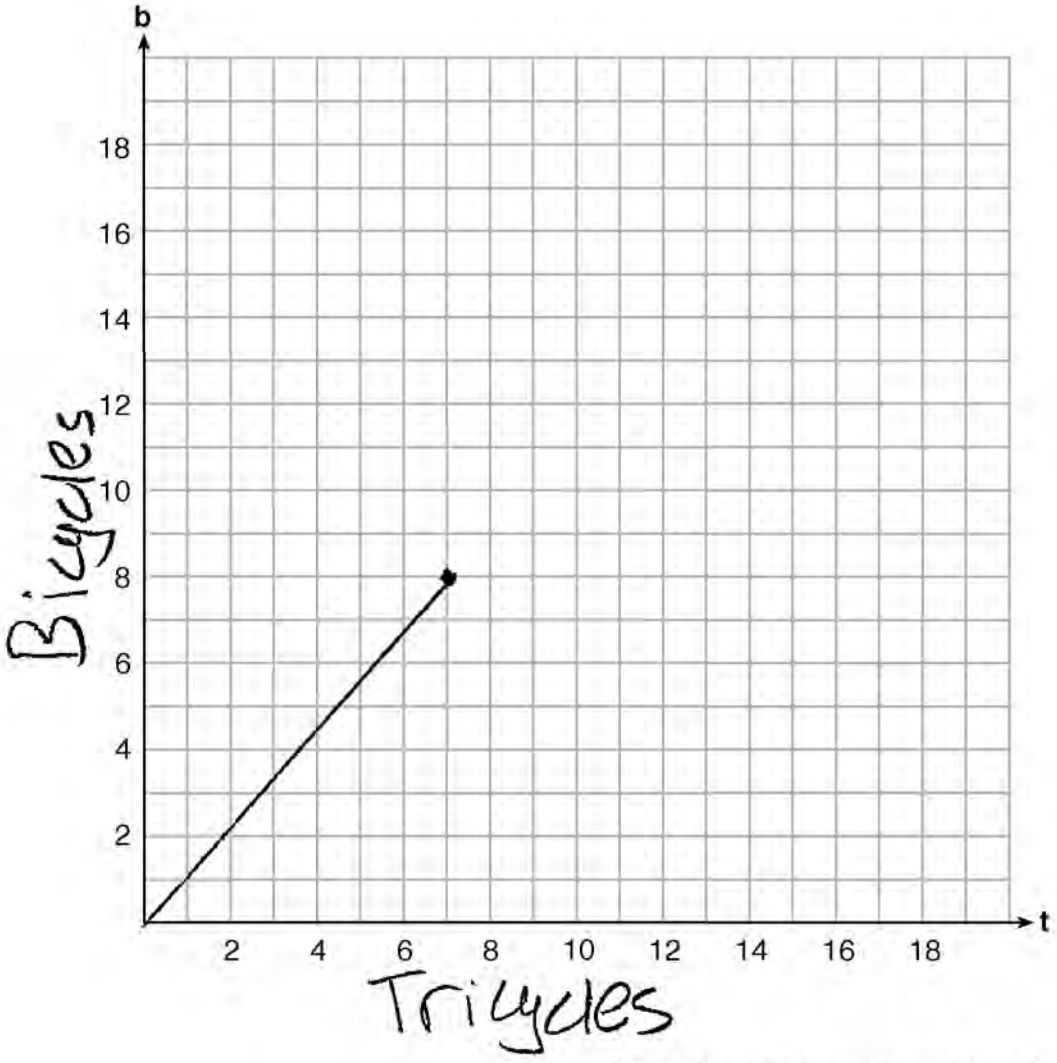
37 A recreation center ordered a total of 15 tricycles and bicycles from a sporting goods store. The number of wheels for all the tricycles and bicycles totaled 38.

Write a linear system of equations that models this scenario, where t represents the number of tricycles and b represents the number of bicycles ordered.

$3t+2b=38$
$t+b=15$
$-2t-2b=-30$

$t=8$
$b=7$

On the set of axes below, graph this system of equations.



Question 37 is continued on the next page.

Score 3: The student wrote a correct system of equations and an explanation not based on the graph.

Question 37 continued

Based on your graph of this scenario, could the recreation center have ordered 10 tricycles? Explain your reasoning.

If they ordered 10 tricycles then they would have ordered 5 bicycles. 10 tricycles would have 30 wheels and 5 bicycles would have 10 wheels. There would be a total of 40 wheels. Therefore they cannot order 10 tricycles.

Question 37

37 A recreation center ordered a total of 15 tricycles and bicycles from a sporting goods store. The number of wheels for all the tricycles and bicycles totaled 38.

Write a linear system of equations that models this scenario, where t represents the number of tricycles and b represents the number of bicycles ordered.

$3t + 2b = 38$

$t + b = 15$

$b = 15 - t$

$3t + 2(15 - t)$

$2t + 15 = 38$

bicycles & tricycles

$38 = 2t + 15$

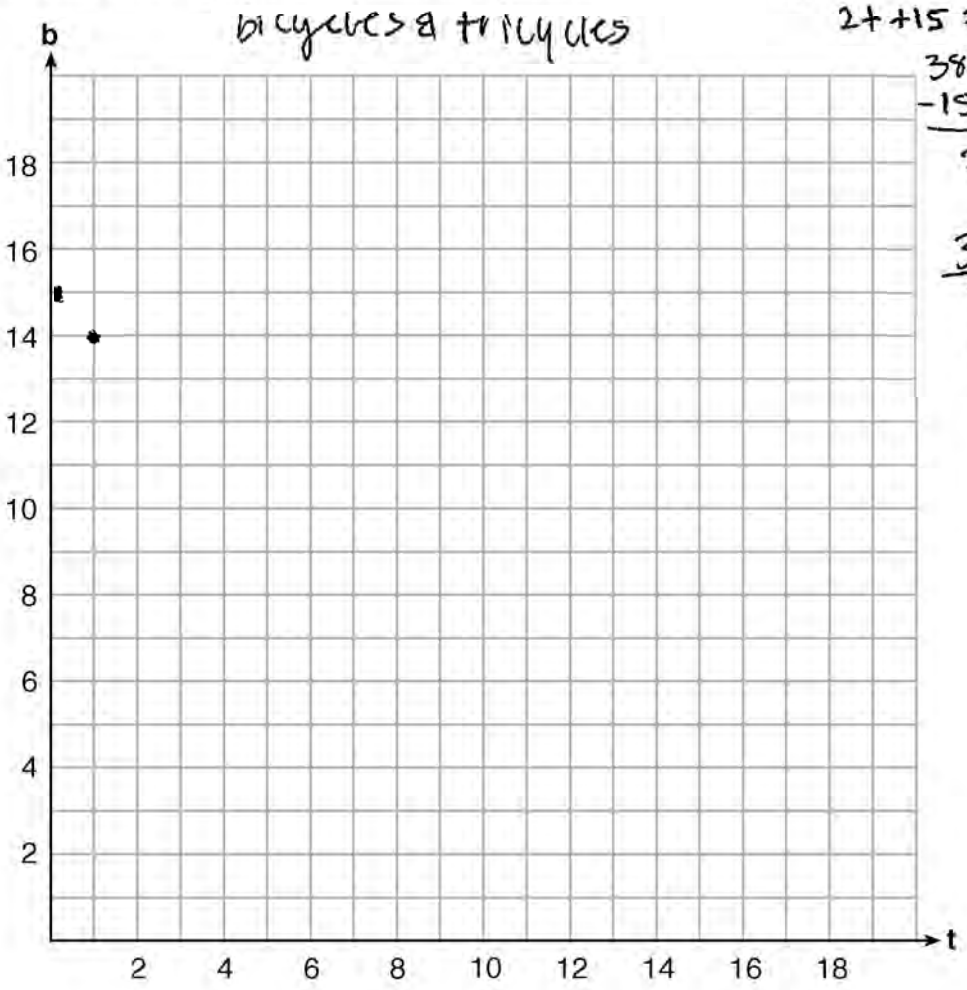
$-15 \quad -15$

$23 = 2t$

$\frac{3t}{3} = \frac{38 - 2b}{3}$

$t =$

On the set of axes below, graph this system of equations.



Question 37 is continued on the next page.

Score 2: The student wrote a correct system of equations.

Question 37

Question 37 continued

Based on your graph of this scenario, could the recreation center have ordered 10 tricycles? Explain your reasoning.

30 + 10

No,

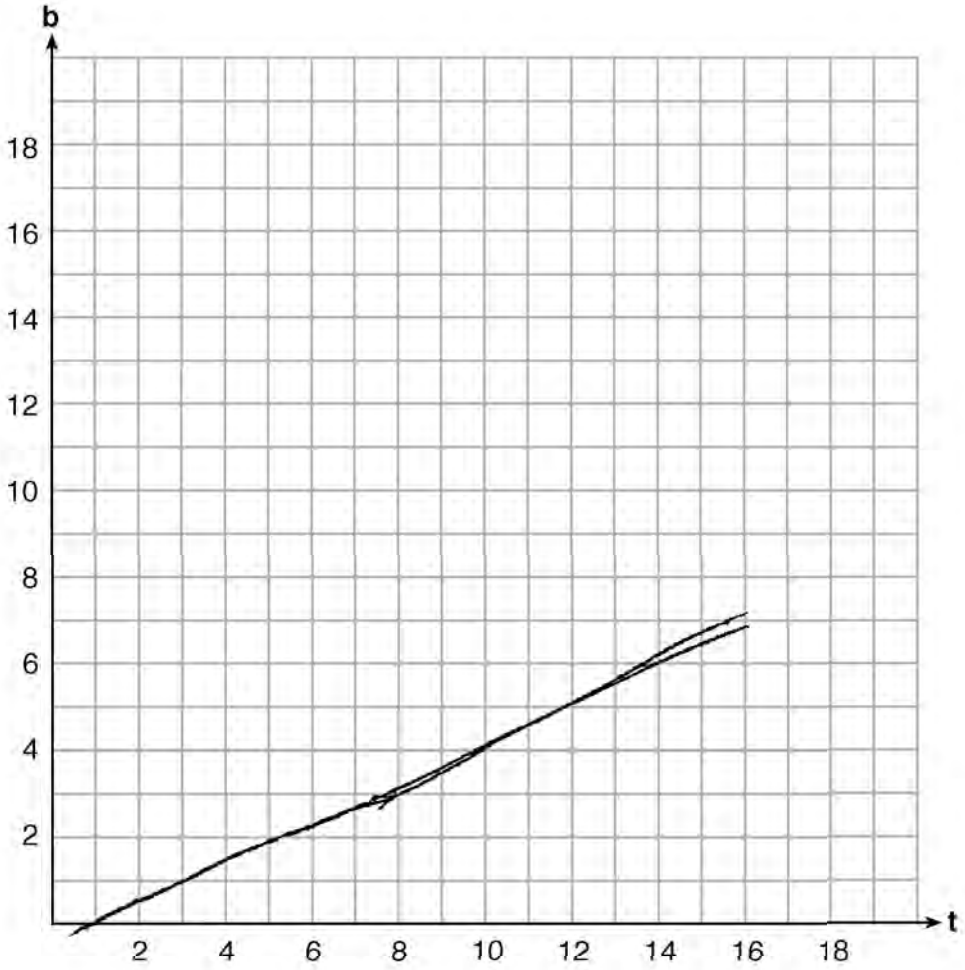
Question 37

37 A recreation center ordered a total of 15 tricycles and bicycles from a sporting goods store. The number of wheels for all the tricycles and bicycles totaled 38.

Write a linear system of equations that models this scenario, where t represents the number of tricycles and b represents the number of bicycles ordered.

$f(x) = 15(x) = 38$

On the set of axes below, graph this system of equations.



Question 37 is continued on the next page.

Score 1: The student wrote an explanation not based on a graph.

Question 37 continued

Based on your graph of this scenario, could the recreation center have ordered 10 tricycles? Explain your reasoning.

No, because if the would've ordered 10 tricycles, they would have to buy 5 bicycles, the end result would be 40 wheels in total.

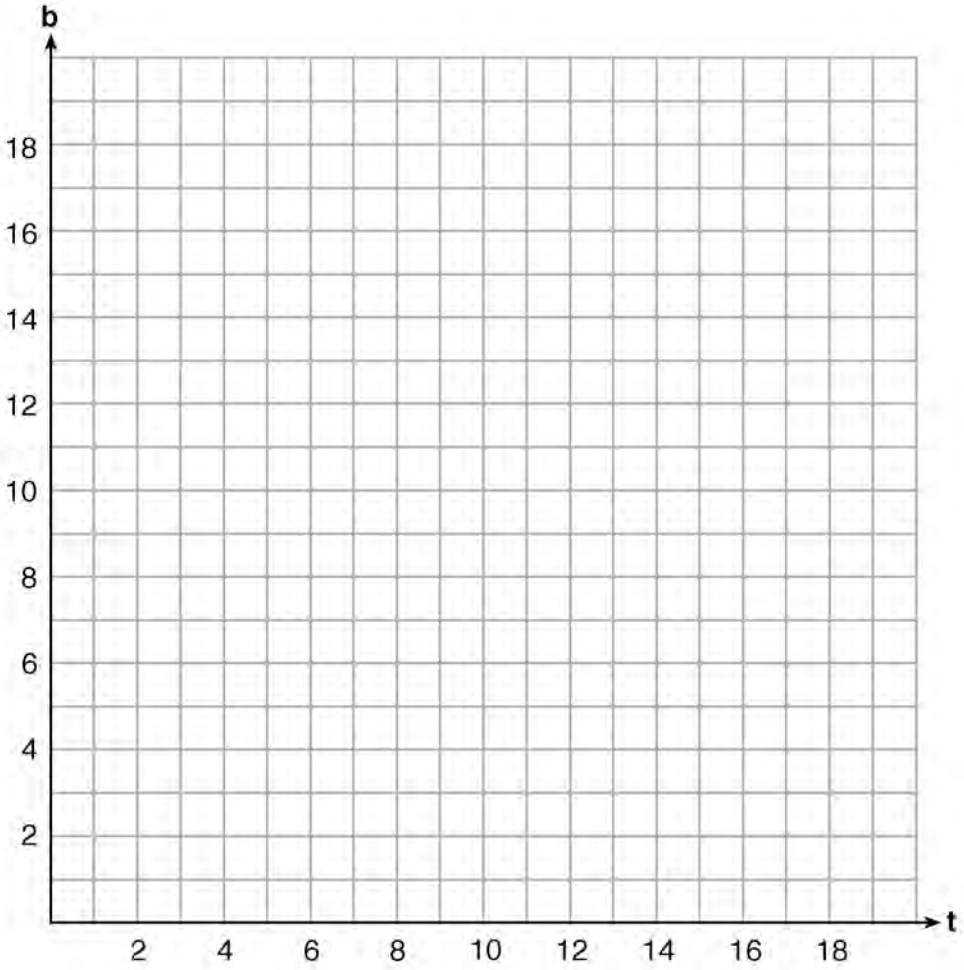
Question 37

37 A recreation center ordered a total of 15 tricycles and bicycles from a sporting goods store. The number of wheels for all the tricycles and bicycles totaled 38.

Write a linear system of equations that models this scenario, where t represents the number of tricycles and b represents the number of bicycles ordered.

$3t + 2b \leq 38$

On the set of axes below, graph this system of equations.



Question 37 is continued on the next page.

Score 0: The student showed no correct work.

Question 37 continued

Based on your graph of this scenario, could the recreation center have ordered 10 tricycles? Explain your reasoning.