The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Wednesday, August 16, 2017 — 8:30 to 11:30 a.m., only

MODEL RESPONSE SET

Table of Contents

Question 25

25 A teacher wrote the following set of numbers on the board:

$a = \sqrt{20}$ irrational $b = 2.5$ rational $c = \sqrt{225} = 15$ rational

Explain why $a + b$ is irrational, but $b + c$ is rational.

The only way you get a rational is when you add 2 rational numbers otherwise its irrational.

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

Question 25

25 A teacher wrote the following set of numbers on the board:

$a = \sqrt{20}$ I $b = 2.5$ R $c = \sqrt{225}$ R

Explain why $a + b$ is irrational, but $b + c$ is rational.

a+b is Irrational because the sum of an irrational and a rational is an irrational number

b+c is Rational because the sum of two rational numbers is rational

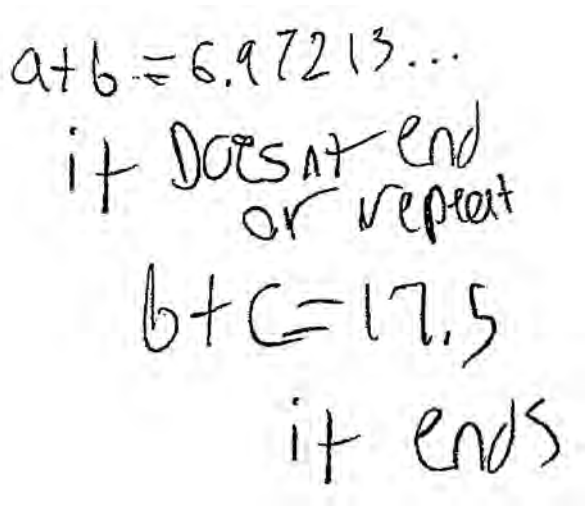
Score 2: The student gave a complete and correct response.

Question 25

25 A teacher wrote the following set of numbers on the board:

$$a = \sqrt{20} \qquad b = 2.5 \qquad c = \sqrt{225}$$

Explain why $a + b$ is irrational, but $b + c$ is rational.



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

Question 25

25 A teacher wrote the following set of numbers on the board:

$$a = \sqrt{20} \qquad b = 2.5 \qquad c = \sqrt{225}$$

Explain why $a + b$ is irrational, but $b + c$ is rational.

The reason is that "a" is a irrational number. A irrational + rational number = irrational

$\sqrt{20}$

4.472135955

Score 1: The student wrote one correct explanation.

Question 25

25 A teacher wrote the following set of numbers on the board:

$$a = \sqrt{20} \qquad b = 2.5 \qquad c = \sqrt{225}$$

Explain why $a + b$ is irrational, but $b + c$ is rational.

$\sqrt{20} + 2.5$

6.10

a+b is irrational because the square root comes first

$2.5 + \sqrt{225}$

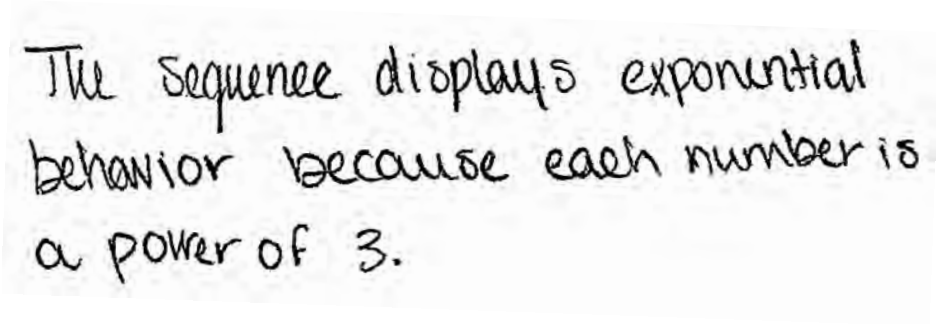
17.5

b+c irrational because the square root is last.

Score 0: The student wrote two incorrect explanations.

Question 26

26 Determine and state whether the sequence 1, 3, 9, 27,… displays exponential behavior. Explain how you arrived at your decision.



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

Question 26

26 Determine and state whether the sequence 1, 3, 9, 27,… displays exponential behavior. Explain how you arrived at your decision.

0 1 2 3

$y = a \cdot b^x$
$y = 1 \cdot 3^2$
$y = 1 \cdot 9$
$y = 9$

$y = 1 \cdot 3^1$
$y = 1 \cdot 3$
$y = 3$

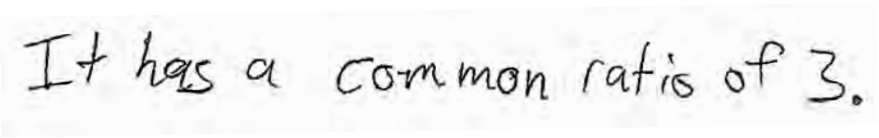
$y = 1 \cdot 3^0$
$y = 1 \cdot 1$
$y = 1$

Yes, this sequence displays exponential behavior. I explain this with my work above. As my exponent on 3^x went up from 0 to 2, I got the first three numbers in the sequence.

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

Question 26

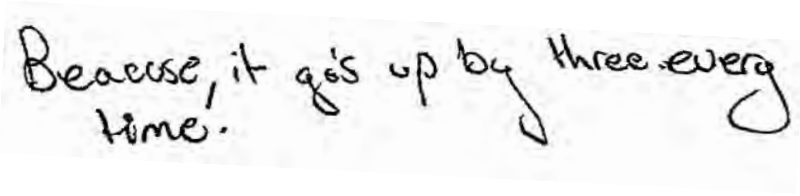
26 Determine and state whether the sequence 1, 3, 9, 27,… displays exponential behavior. Explain how you arrived at your decision.



Score 1: The student did not indicate a positive response in the explanation.

Question 26

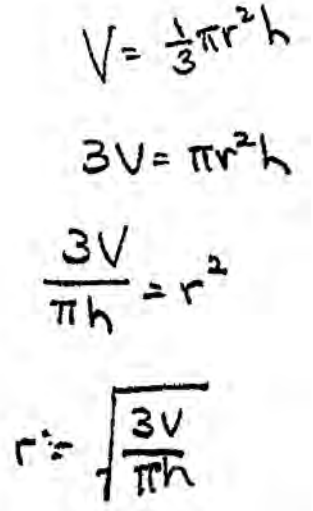
26 Determine and state whether the sequence 1, 3, 9, 27,… displays exponential behavior. Explain how you arrived at your decision.



Score 0: The student did not indicate a positive response and wrote an incorrect explanation.

Question 27

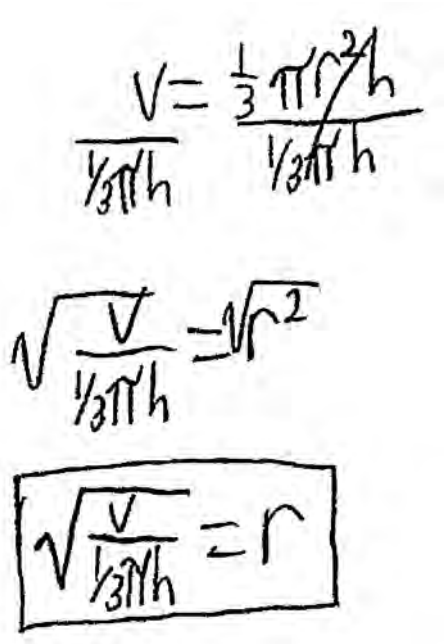
27 Using the formula for the volume of a cone, express r in terms of V, h, and π.



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

Question 27

27 Using the formula for the volume of a cone, express r in terms of V, h, and π.



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

Question 27

27 Using the formula for the volume of a cone, express r in terms of V, h, and π.

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

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

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

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

$\sqrt{\frac{V}{3\pi h}} = r$

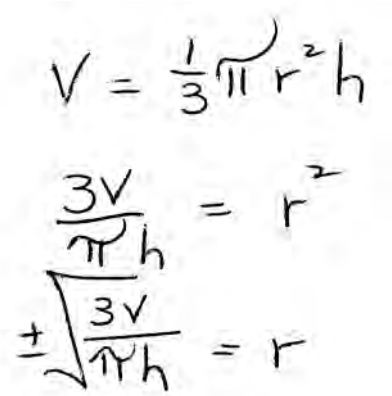
$\sqrt{\frac{V}{1.047197551\,h}} = r$

$r = \sqrt{\frac{V}{1.047197551\,h}}$

Score 1: The student did not leave the answer in terms of π.

Question 27

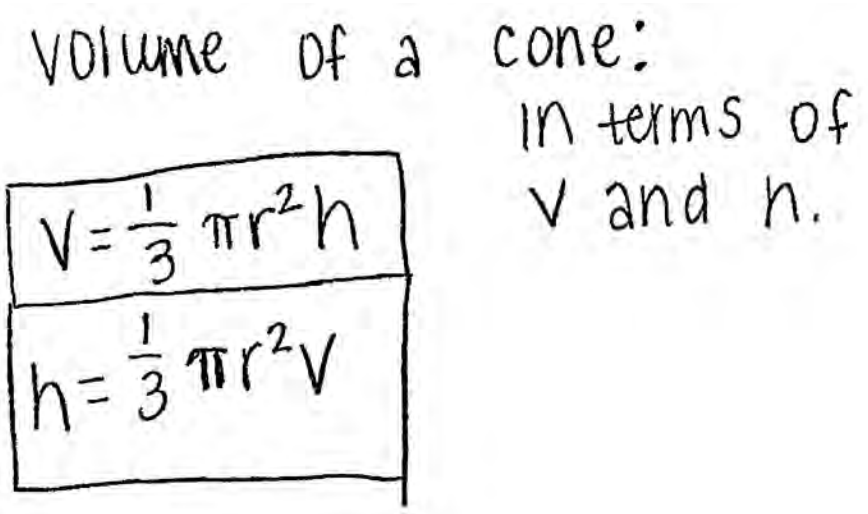
27 Using the formula for the volume of a cone, express r in terms of V, h, and π.



Score 1: The student did not understand that the length of the radius can only be a positive number.

Question 27

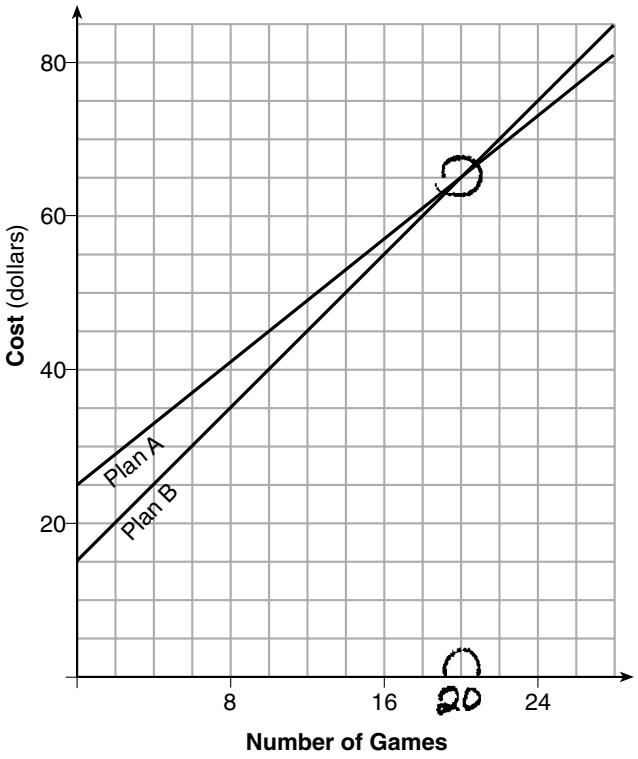
27 Using the formula for the volume of a cone, express r in terms of V, h, and π.



Score 0: The student wrote an incorrect response.

Question 28

28 The graph below models the cost of renting video games with a membership in Plan *A* and Plan *B*.



Explain why Plan *B* is the better choice for Dylan if he only has \$50 to spend on video games, including a membership fee.

He gets 2 more video games

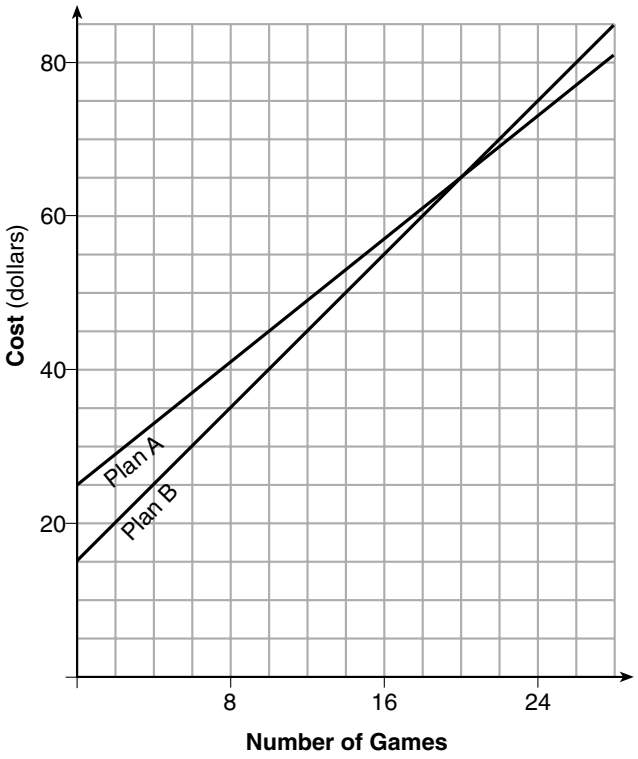
Bobby wants to spend \$65 on video games, including a membership fee. Which plan should he choose? Explain your answer.

either because both plans (A & B) have 20 games when \$65 is spent.

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

Question 28

28 The graph below models the cost of renting video games with a membership in Plan *A* and Plan *B*.



Explain why Plan *B* is the better choice for Dylan if he only has $50 to spend on video games, including a membership fee.

With Plan B, he can buy 14 games with $50.
With Plan A, he can only buy 12 games with $50.

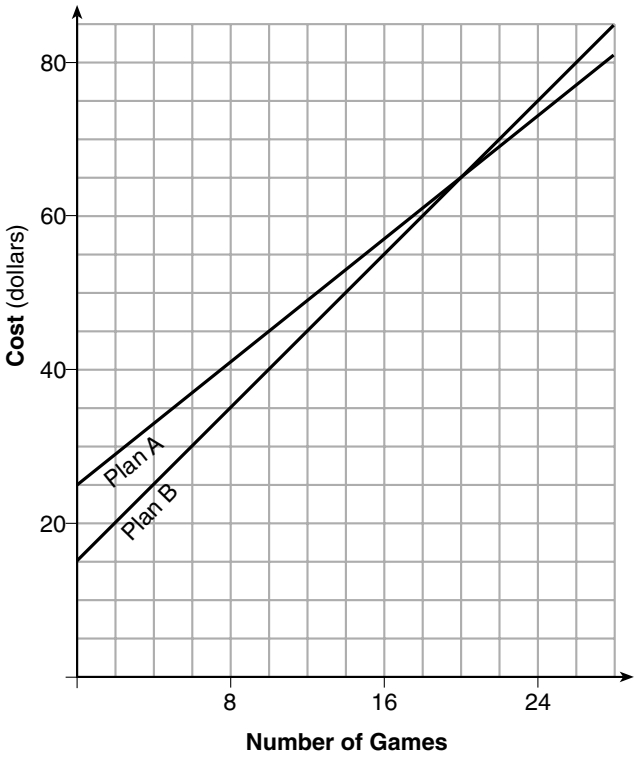
Bobby wants to spend $65 on video games, including a membership fee. Which plan should he choose? Explain your answer.

It wouldn't matter which plan he uses because they both offer 20 games for $65.

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

Question 28

28 The graph below models the cost of renting video games with a membership in Plan *A* and Plan *B*.



Explain why Plan *B* is the better choice for Dylan if he only has \$50 to spend on video games, including a membership fee.

Plan B starts less expensive and has a slower rate

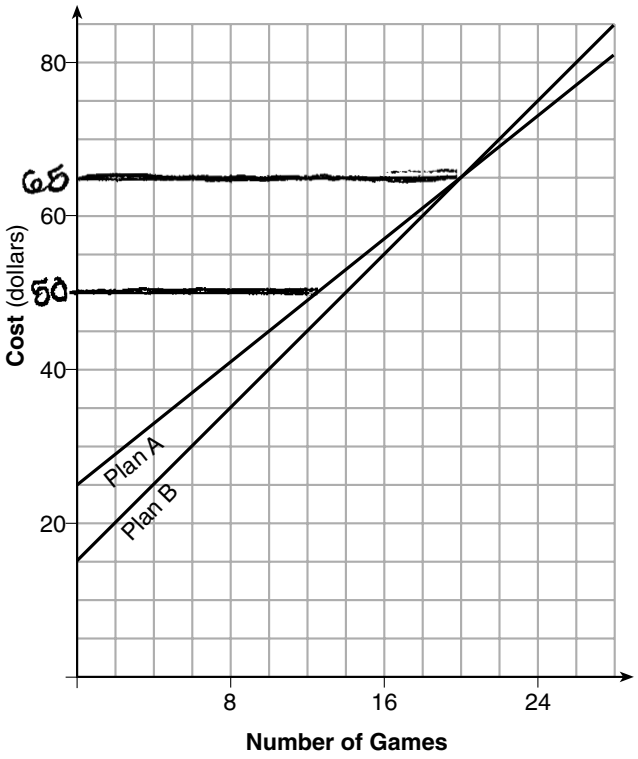
Bobby wants to spend \$65 on video games, including a membership fee. Which plan should he choose? Explain your answer.

Plan B as he would get the same amount of games (20) for each.

Score 1: The student wrote a correct explanation for Bobby.

Question 28

28 The graph below models the cost of renting video games with a membership in Plan *A* and Plan *B*.



24 games $75 (B
18 games $60 (A

Explain why Plan *B* is the better choice for Dylan if he only has $50 to spend on video games, including a membership fee.

Plan B is the better choice for Dylan because in this plan he can get more games. Plan B gets him 14 games for $50 and Plan A gets him about 13.

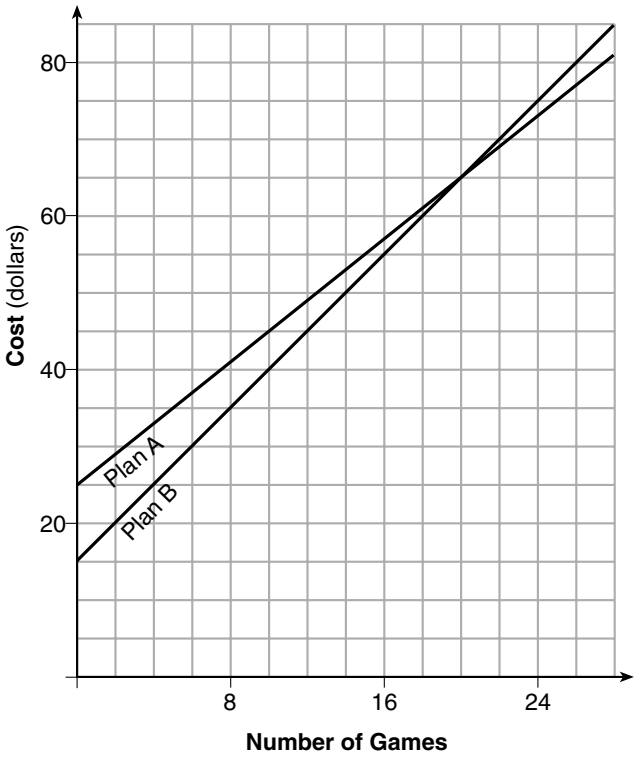
Bobby wants to spend $65 on video games, including a membership fee. Which plan should he choose? Explain your answer.

Bobby should choose Plan B because if he wanted to spend less than his $65 he will get better prices.

Score 1: The student wrote a correct explanation for Dylan.

Question 28

28 The graph below models the cost of renting video games with a membership in Plan *A* and Plan *B*.



Explain why Plan *B* is the better choice for Dylan if he only has $50 to spend on video games, including a membership fee.

He gets more games

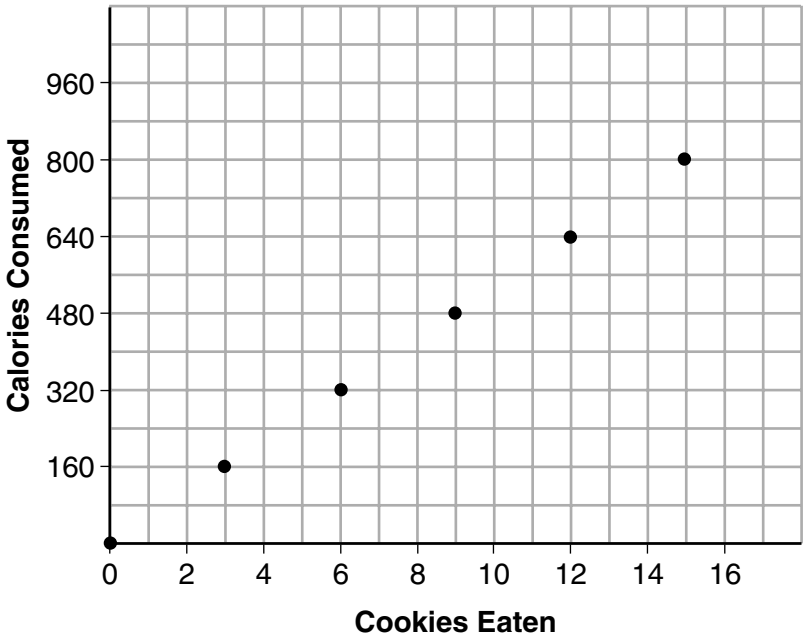
Bobby wants to spend $65 on video games, including a membership fee. Which plan should he choose? Explain your answer.

They are the same

Score 0: The student wrote two incomplete explanations.

Question 29

29 Samantha purchases a package of sugar cookies. The nutrition label states that each serving size of 3 cookies contains 160 Calories. Samantha creates the graph below showing the number of cookies eaten and the number of Calories consumed.



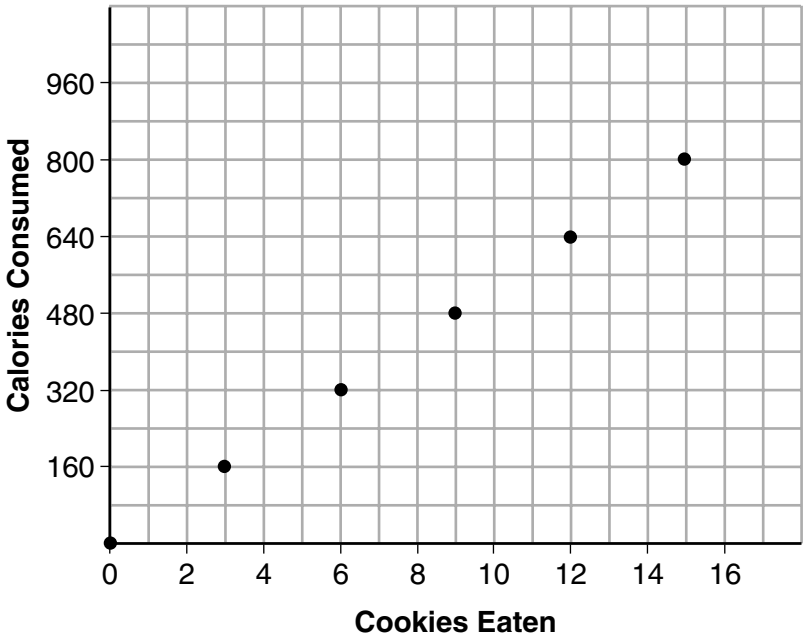
Explain why it is appropriate for Samantha to draw a line through the points on the graph.

Samantha should connect the dots because she can consume 1 cookie or 2 cookies or a part of a cookie and if she does the correct number of calories would correspond with the number of cookies she ate.

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

Question 29

29 Samantha purchases a package of sugar cookies. The nutrition label states that each serving size of 3 cookies contains 160 Calories. Samantha creates the graph below showing the number of cookies eaten and the number of Calories consumed.



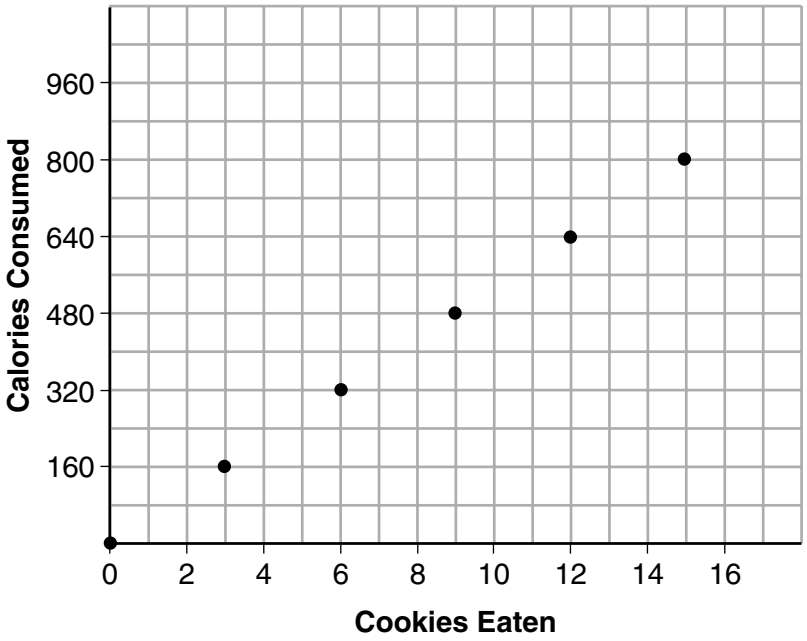
Explain why it is appropriate for Samantha to draw a line through the points on the graph.

No, because Samantha cannot eat a decimal amount of cookies, so if the were to connect the graph, this would indicate that all points on the line were included.

Score 1: The student did not understand that a part of a cookie could be consumed.

Question 29

29 Samantha purchases a package of sugar cookies. The nutrition label states that each serving size of 3 cookies contains 160 Calories. Samantha creates the graph below showing the number of cookies eaten and the number of Calories consumed.



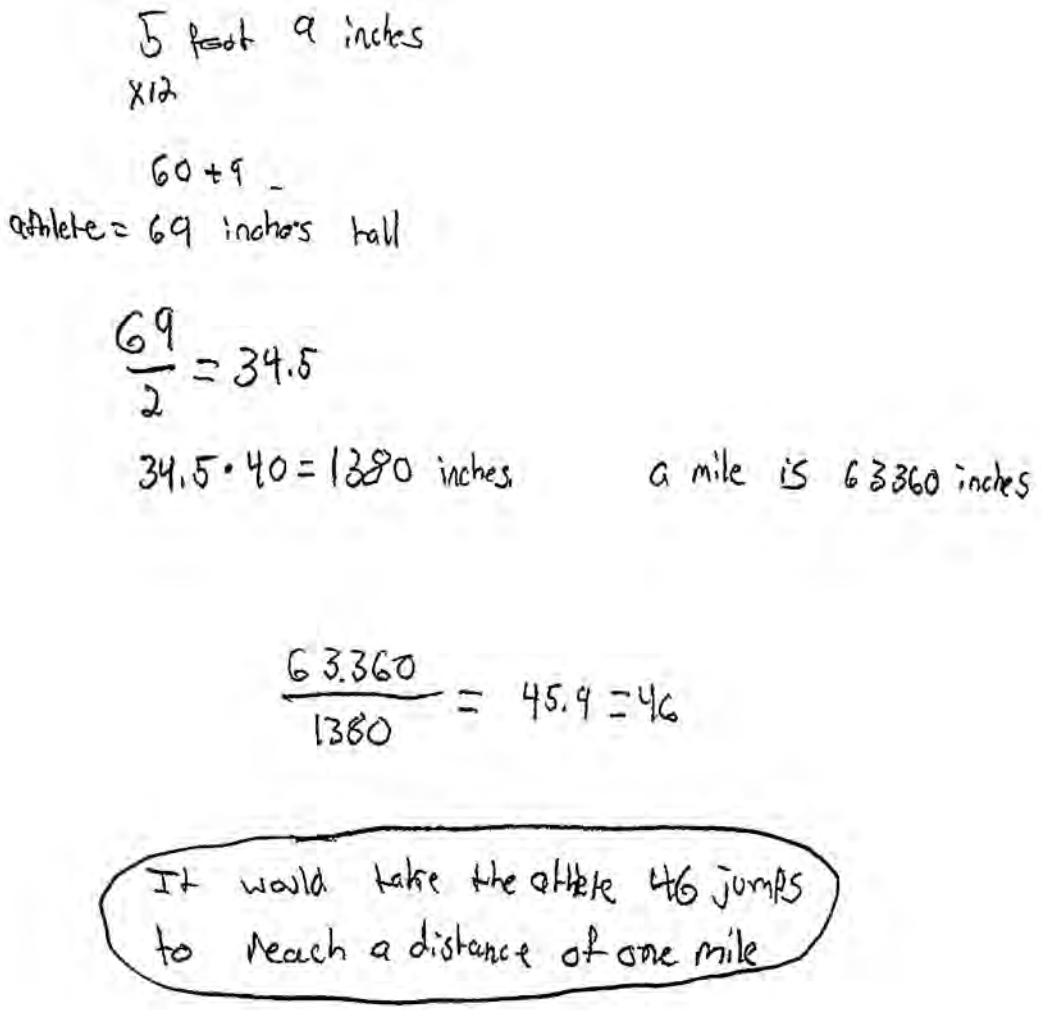
Explain why it is appropriate for Samantha to draw a line through the points on the graph.

Yes to show that
the calories increase

Score 0: The student wrote an irrelevant explanation.

Question 30

30 A two-inch-long grasshopper can jump a horizontal distance of 40 inches. An athlete, who is five feet nine, wants to cover a distance of one mile by jumping. If this person could jump at the same ratio of body-length to jump-length as the grasshopper, determine, to the *nearest jump*, how many jumps it would take this athlete to jump one mile.



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

Question 30

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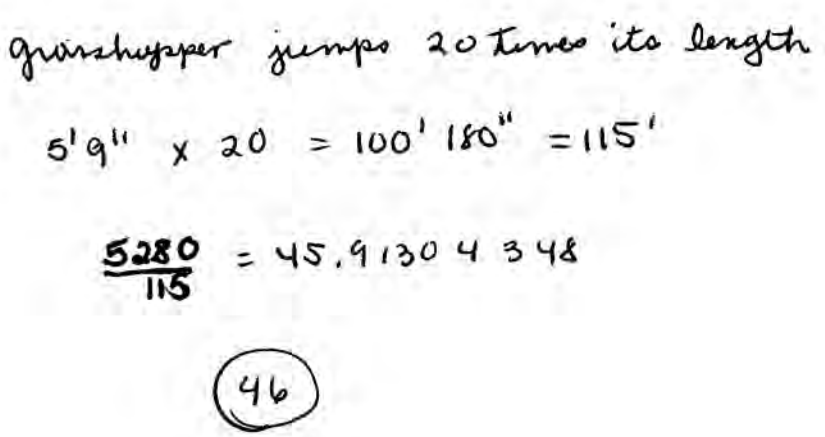

Score 2: The student gave a complete and correct response.

Question 30

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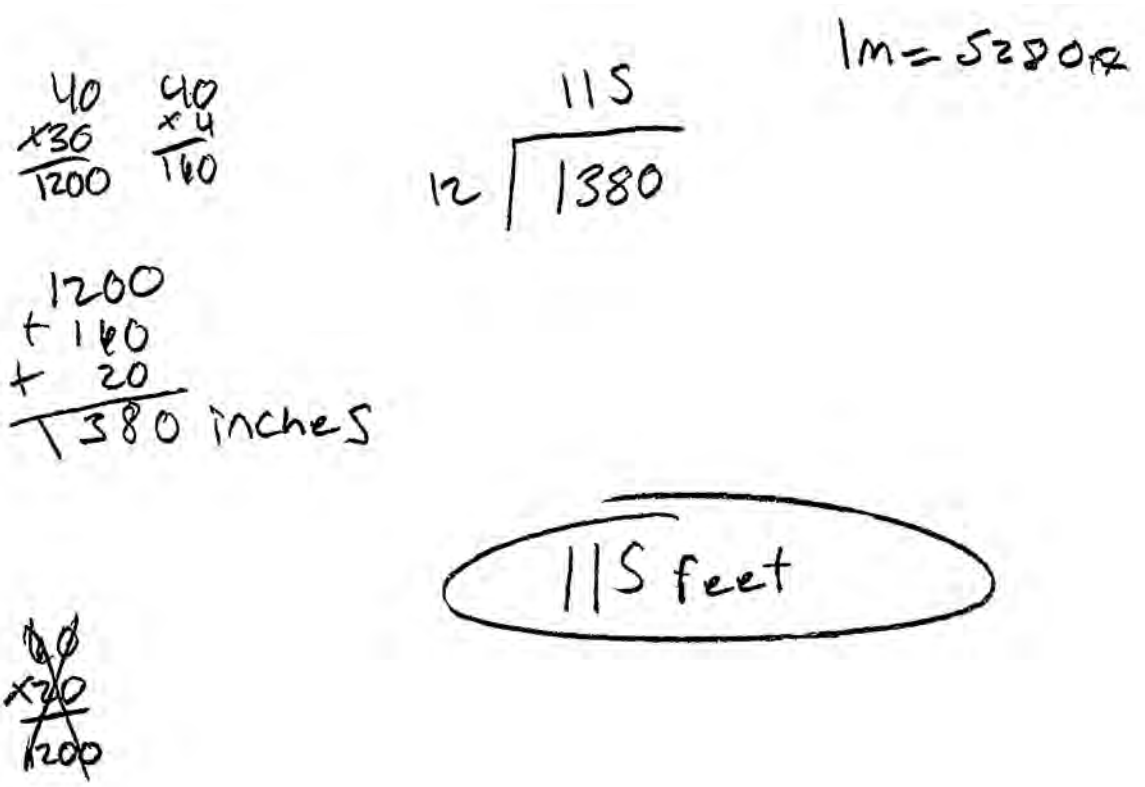
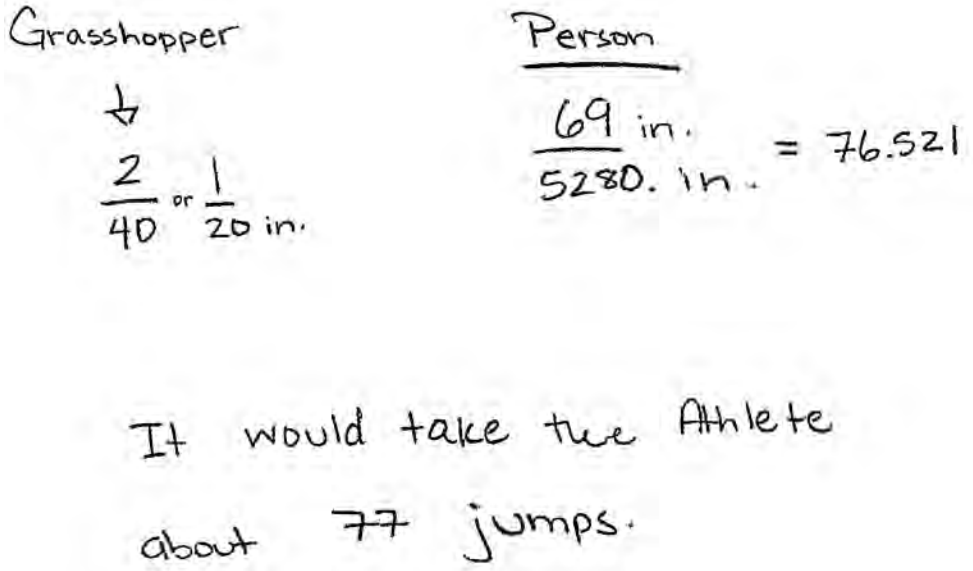


Score 1: The student found the distance the athlete could cover in one jump.

Question 30

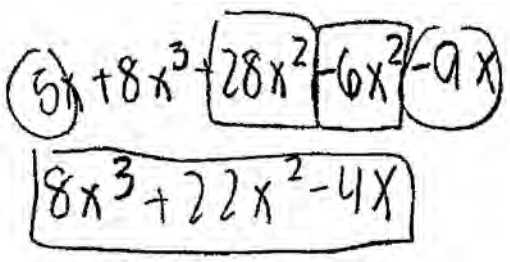
30 A two-inch-long grasshopper can jump a horizontal distance of 40 inches. An athlete, who is five feet nine, wants to cover a distance of one mile by jumping. If this person could jump at the same ratio of body-length to jump-length as the grasshopper, determine, to the *nearest jump*, how many jumps it would take this athlete to jump one mile.



Score 0: The student wrote a completely incorrect response.

Question 31

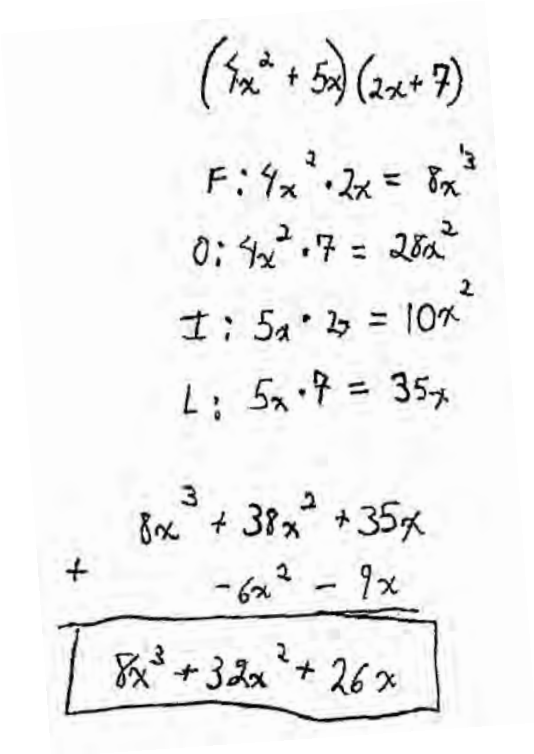
31 Write the expression $5x + 4x^2(2x + 7) - 6x^2 - 9x$ as a polynomial in standard form.



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

Question 31

31 Write the expression $5x + 4x^2(2x + 7) - 6x^2 - 9x$ as a polynomial in standard form.



Score 1: The student made an error by writing $5x + 4x^2$ as $(4x^2 + 5x)$, but simplified the expression appropriately.

Question 31

31 Write the expression $5x + 4x^2(2x + 7) - 6x^2 - 9x$ as a polynomial in standard form.

$5x + 4x^2(2x+7) - 6x^2 - 9$

$5x + 8x^3 + 28x^2 - 6x^2 - 9$

$5x + 8x^3 + 22x^2 - 9$

$8x^3 + 22x^2 + 5x - 9$

Score 1: The student made a transcription error by writing $9x$ as 9, but simplified the expression appropriately.

Question 31

31 Write the expression $5x + 4x^2(2x + 7) - 6x^2 - 9x$ as a polynomial in standard form.

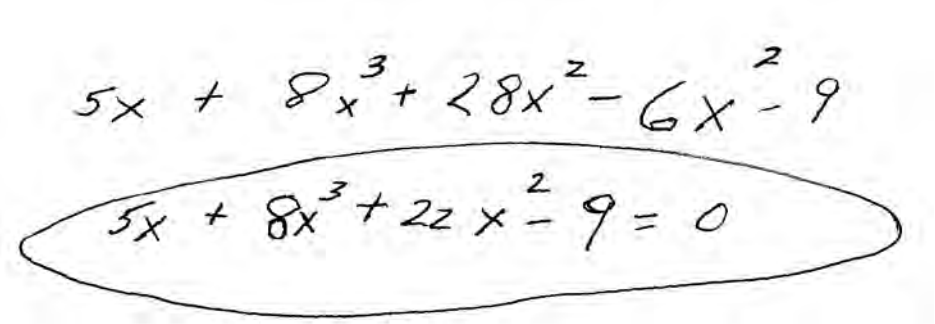
$5x + 8x^3 + 28x^2 - 6x^2 - 9x$

$8x^3 + 22x^2 - 4x = 0$

Score 1: The student wrote a correct trinomial, but set it equal to zero.

Question 31

31 Write the expression $5x + 4x^2(2x + 7) - 6x^2 - 9x$ as a polynomial in standard form.



Score 0: The student made a transcription error by writing $9x$ as 9, did not write the expression in standard form, and set the expression equal to zero.

Question 32

32 Solve the equation $x^2 - 6x = 15$ by completing the square.

$x^2 - 6x = 15$

$\left(\frac{-6}{2}\right)^2 = (-3)^2 = 9$

$x^2 - 6x + 9 = 15 + 9$

$\sqrt{(x-3)^2} = \sqrt{24}$

$x - 3 = \pm\sqrt{24}$

$+3 \quad +3$

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

$\{3 + 2\sqrt{6}, 3 - 2\sqrt{6}\}$

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

Question 32

32 Solve the equation $x^2 - 6x = 15$ by completing the square.

$-15 \quad -15$

$x^2 - 6x - 15 = 0$

$(x^2 - 6x + 9) - 15 - 9 = 0$

$(x-3)^2 - 24 = 0$

$+24 \quad +24$

$\sqrt{(x-3)^2} = \sqrt{24}$

$x - 3 = \pm\sqrt{24}$

$+3 \quad +3$

$x = \pm\sqrt{24} + 3$

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

Question 32

32 Solve the equation $x^2 - 6x = 15$ by completing the square.

$x^2 - 6x = 15$

$x^2 - 6x + 9 = 15 + 9$

$\left(\frac{-6}{2}\right)^2 = (-3)^2 = 9$

$(x-3)^2 = 24$

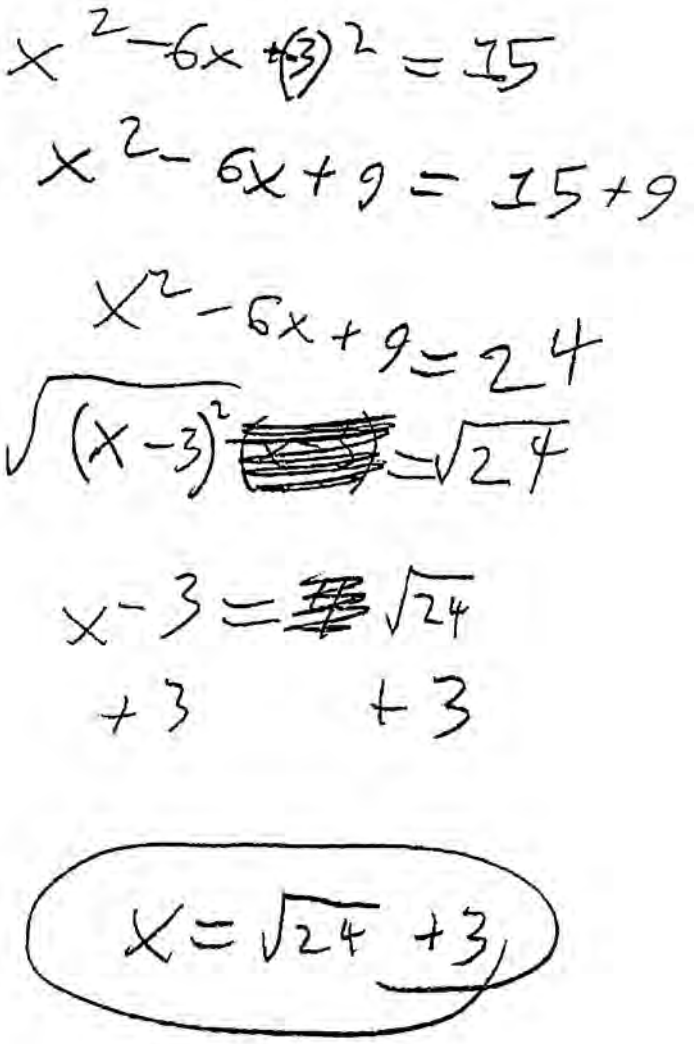
$-24 \quad -24$

$y = (x-3)^2 - 24$

Score 1: The student completed the square correctly, but did not solve for x.

Question 32

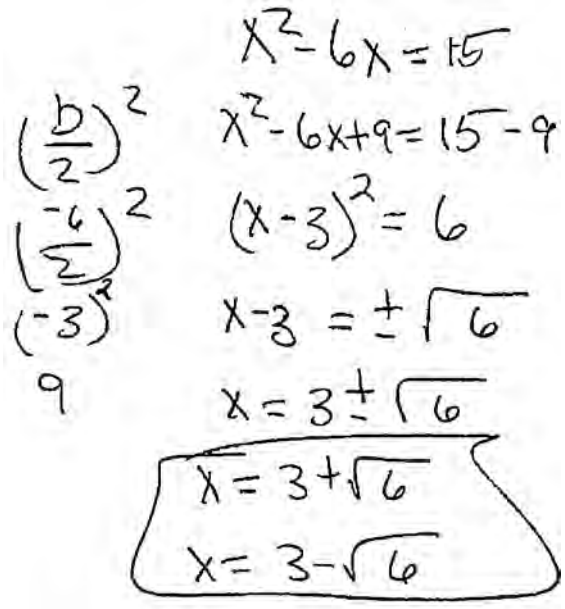
32 Solve the equation $x^2 - 6x = 15$ by completing the square.



Score 1: The student made an error by not writing $\pm\sqrt{24}$.

Question 32

32 Solve the equation $x^2 - 6x = 15$ by completing the square.



Score 1: The student did not add 9 to the right side of the equation.

Question 32

32 Solve the equation $x^2 - 6x = 15$ by completing the square.

$x^2 - 6x = 15$

$\frac{-6}{2}$

$(-3)^2$

$(x-3)^2 = 15$

$(x-3) = \sqrt{15}$

$x = 3 + \sqrt{15}$

Score 0: The student did not add 9 to the right side of the equation and did not write $\pm\sqrt{15}$.

Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.

55 (4) = 220
610 - 220 = 390
390 ÷ 65 = 6
6 + 4 = 10
It will take a total of 10 hours to reach the destination.

After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.

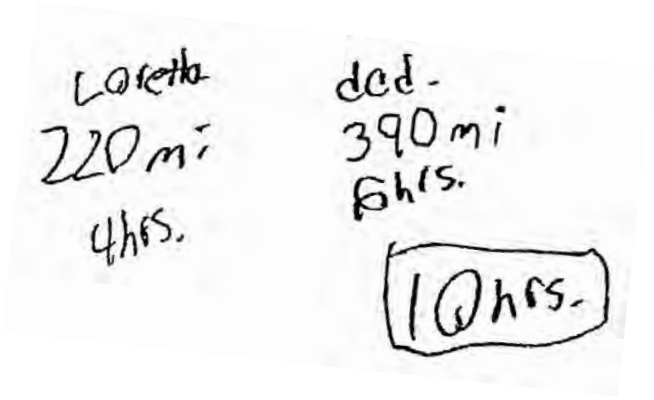
55 (2) = 110
610 - 110 = 500
500 ÷ 65 = 7.7
2 + 7.7 = 9.7
10 - 9.7 = 0.3
The family will save 0.3 hours if Loretta's dad drives the remainder of the trip.

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

Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.



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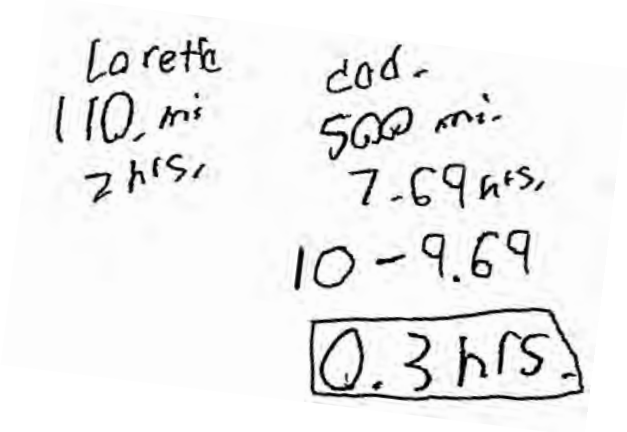
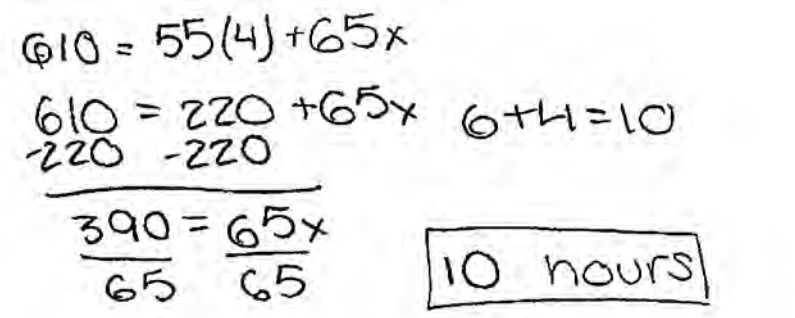


Score 4: The student gave a complete and correct response.

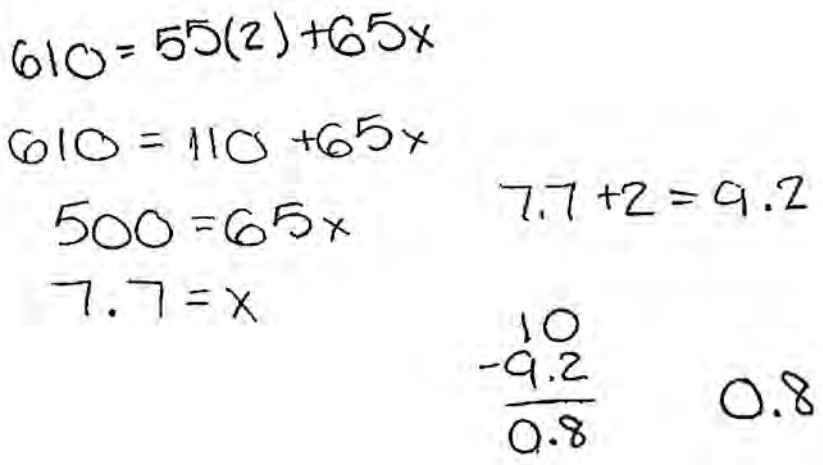
Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.



After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.

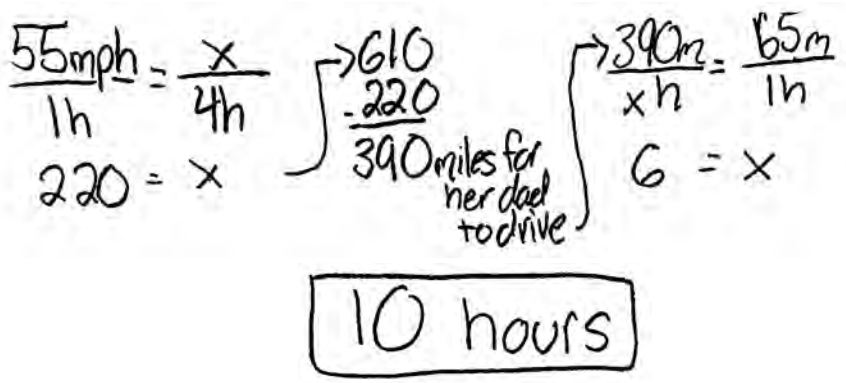


Score 3: The student made an error when adding 7.7 and 2.

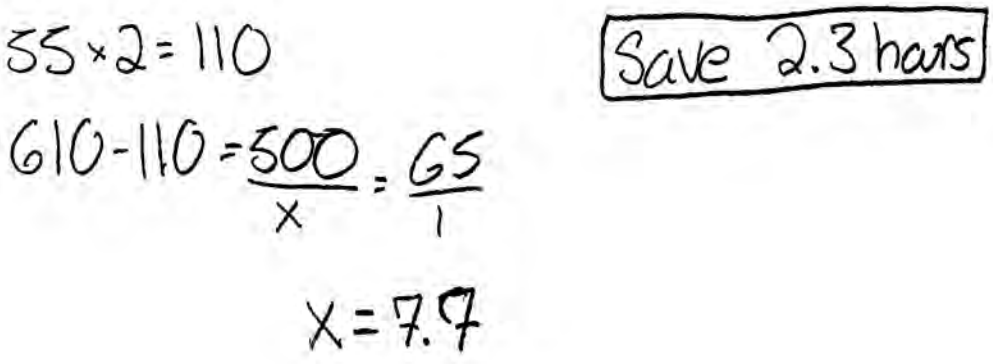
Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.



After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.



Score 3: The student did not consider Loretta's driving time when computing the time for the actual trip.

Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.

h = total time
x = dads driving time
l = loretta's driving time

$4(55) + 65x = 610$

$220 + 65x = 610$

$-220 \quad -220$

$\frac{65x}{65} = \frac{390}{65}$

$x = 6$

$l + x = h$

$4 + 6 =$ 10 hours

After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.

$2(55) + 8(65) = 610$

$110 + 520 = 610$

$630 = 610$ 20 hours

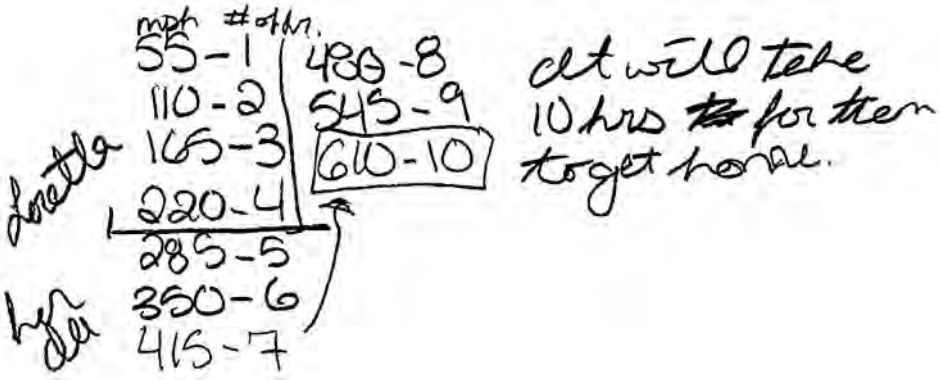
$630 - 610$

Score 2: The student showed correct work to find 10.

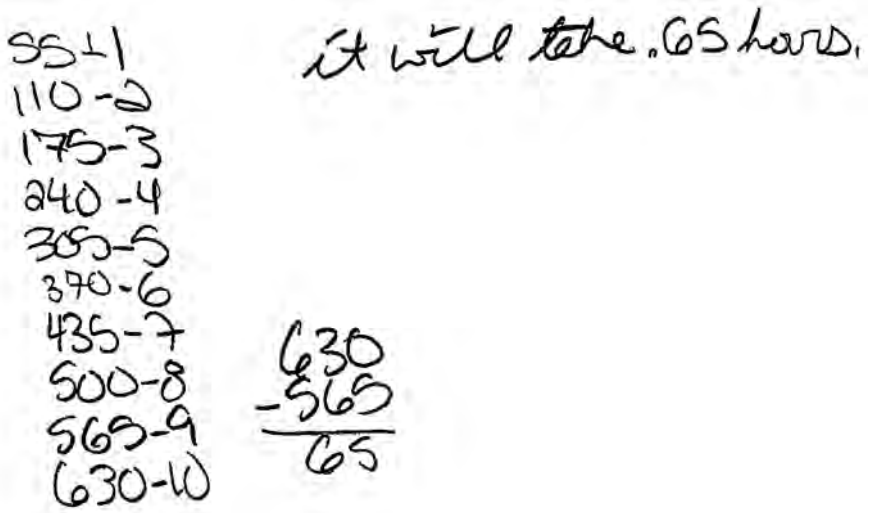
Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.



After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.



Score 2: The student showed correct work to find 10.

Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.

$$55(4) + 65t = 610$$
$$220 + 65t = 610$$
$$65t = 390$$
$$t = 6$$

After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.

$$55(2) + 65t = 610$$
$$110 + 65t = 610$$
$$65t = 500$$
$$t = 7.7$$

Score 1: The student showed correct work to find 6, but did not show enough additional work to receive further credit.

Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.

After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.

$2(55) + 65x = 610$

$110 + 65x = 610$

$65x = 500$

$x = 7.692307692$

$x = 7.7$

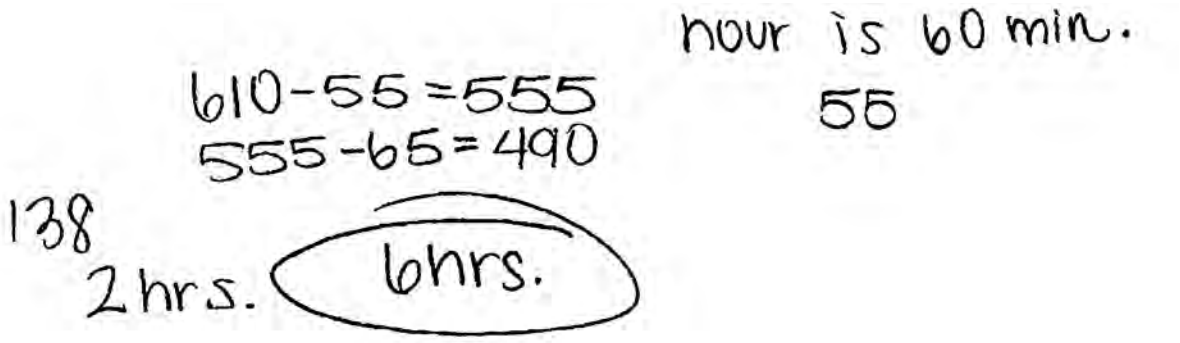
$x + 2 = 9.7$

Score 1: The student found the total time of the actual trip.

Question 33

33 Loretta and her family are going on vacation. Their destination is 610 miles from their home. Loretta is going to share some of the driving with her dad. Her average speed while driving is 55 mph and her dad's average speed while driving is 65 mph.

The plan is for Loretta to drive for the first 4 hours of the trip and her dad to drive for the remainder of the trip. Determine the number of hours it will take her family to reach their destination.



After Loretta has been driving for 2 hours, she gets tired and asks her dad to take over. Determine, to the *nearest tenth of an hour*, how much time the family will save by having Loretta's dad drive for the remainder of the trip.

Score 0: The student did not show appropriate work to find 6.

Question 34

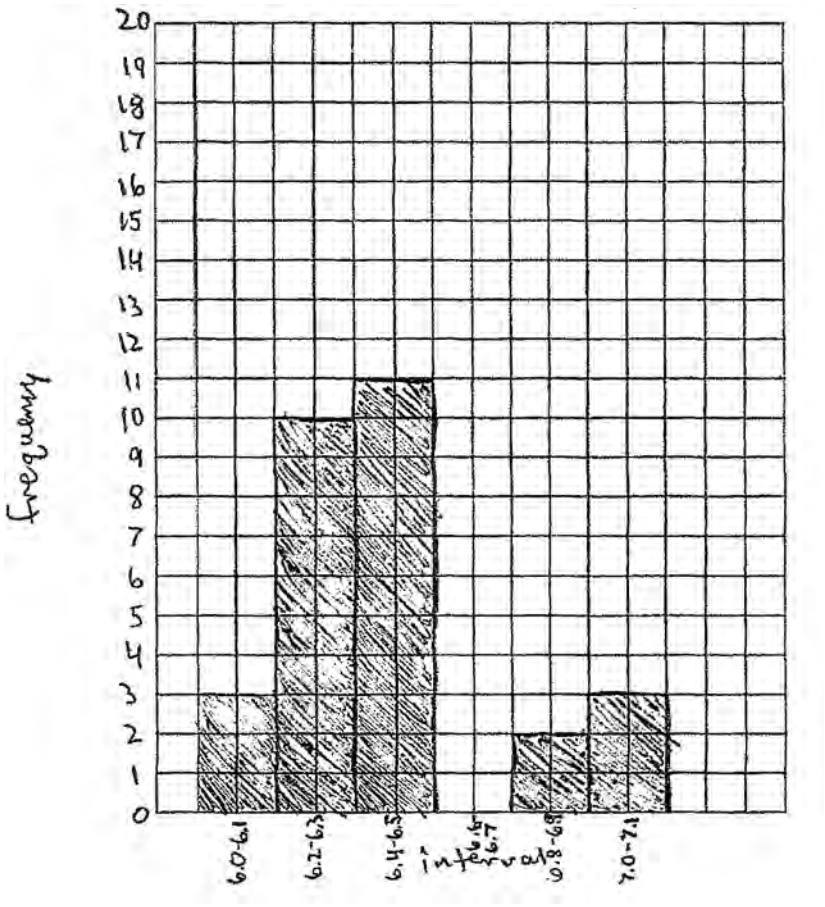
34 The heights, in feet, of former New York Knicks basketball players are listed below.

6.4	6.9	6.3	6.2	6.3	6.0	6.1	6.3	6.8	6.2
6.5	7.1	6.4	6.3	6.5	6.5	6.4	7.0	6.4	6.3
6.2	6.3	7.0	6.4	6.5	6.5	6.5	6.0	6.2	

Using the heights given, complete the frequency table below.

Interval	Frequency	
6.0 – 6.1	III	3
6.2 – 6.3	𝍸	10
6.4 – 6.5	𝍸 I	11
6.6 – 6.7		0
6.8 – 6.9	II	2
7.0 – 7.1	III	3

Based on the frequency table created, draw and label a frequency histogram on the grid below.



Determine and state which interval contains the upper quartile. Justify your response.

The interval 6.4-6.5 contains the upper quartile, because there are 29 heights listed, and 29 divided by 4 (into quarters) is 7.25. If you count back 7.25 heights from the tallest height you get 6.5 which is in that interval.

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

Question 34

34 The heights, in feet, of former New York Knicks basketball players are listed below.

6.4	6.9	6.3	6.2	6.3	6.0	6.1	6.3	6.8	6.2
6.5	7.1	6.4	6.3	6.5	6.5	6.4	7.0	6.4	6.8
6.2	6.3	7.0	6.4	6.5	6.5	6.5	6.0	6.2	

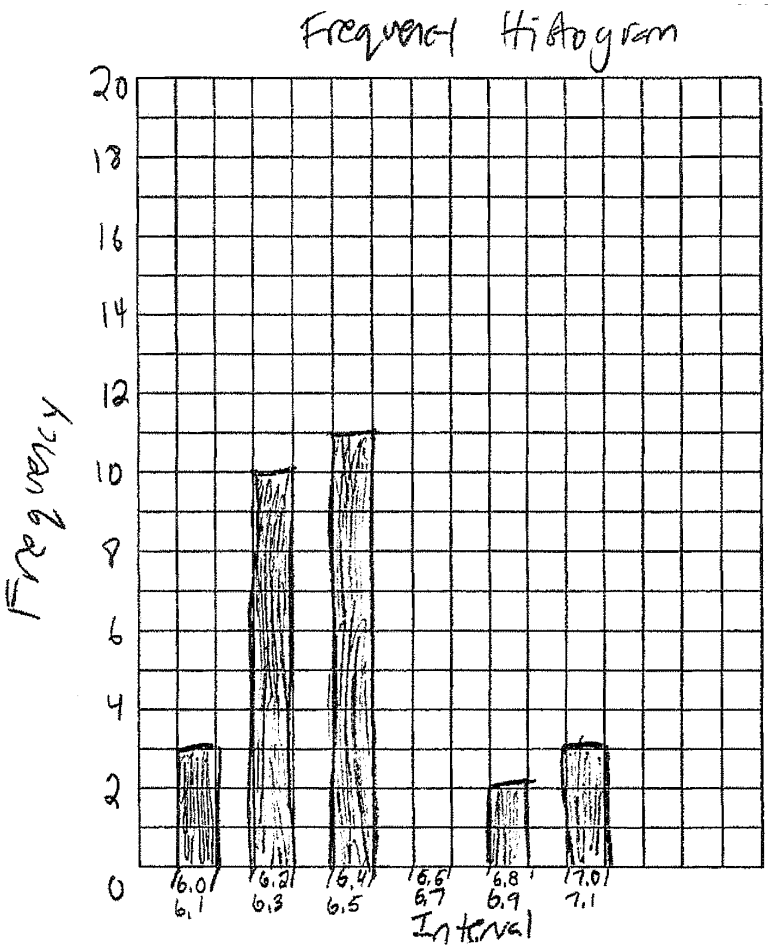
Using the heights given, complete the frequency table below.

Interval	Frequency
6.0 – 6.1	III
6.2 – 6.3	𝍸 𝍸
6.4 – 6.5	𝍸 𝍸 I
6.6 – 6.7	
6.8 – 6.9	II
7.0 – 7.1	III

6.0
6.0
6.1
6.2
6.2
6.2
6.2 — 6.25
6.3
6.3
6.3
6.3
6.3
6.3
6.4
6.4 — median
6.4
6.4
6.4
6.5
6.5
6.5
6.5 — 6.5
6.5
6.5
6.8
6.9
7.0
7.0
7.1

Question 34 continued.

Based on the frequency table created, draw and label a frequency histogram on the grid below.



Determine and state which interval contains the upper quartile. Justify your response.

The 6.4-6.5 interval contains the upper quartile because the upper quartile is 6.5 which fits into that interval

Score 3: The student drew a bar graph instead of a histogram.

Question 34

34 The heights, in feet, of former New York Knicks basketball players are listed below.

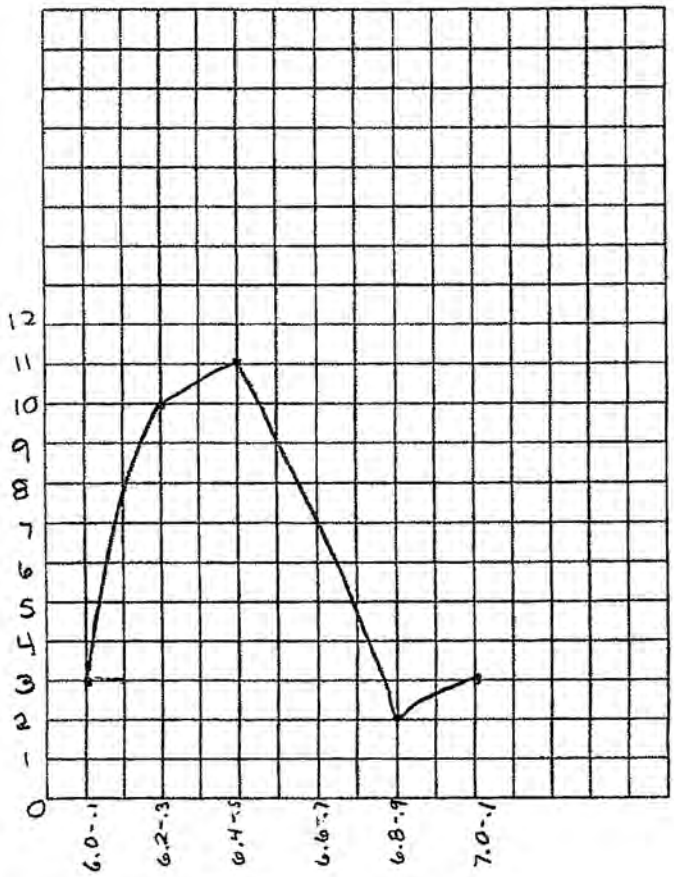
6.4	6.9	6.3	6.2	6.3	6.0	6.1	6.3	6.8	6.2
6.5	7.1	6.4	6.3	6.5	6.5	6.4	7.0	6.4	6.3
6.2	6.3	7.0	6.4	6.5	6.5	6.5	6.0	6.2	

Using the heights given, complete the frequency table below.

Interval	Frequency
6.0 – 6.1	3
6.2 – 6.3	10
6.4 – 6.5	11
6.6 – 6.7	0
6.8 – 6.9	2
7.0 – 7.1	3

Question 34 continued.

Based on the frequency table created, draw and label a frequency histogram on the grid below.



Determine and state which interval contains the upper quartile. Justify your response.

The interval that contains the upper quartile is the group which stands between 6.4 - 6.5 feet.

Score 2: The student drew a line graph instead of a histogram and did not give a justification.

Question 34

34 The heights, in feet, of former New York Knicks basketball players are listed below.

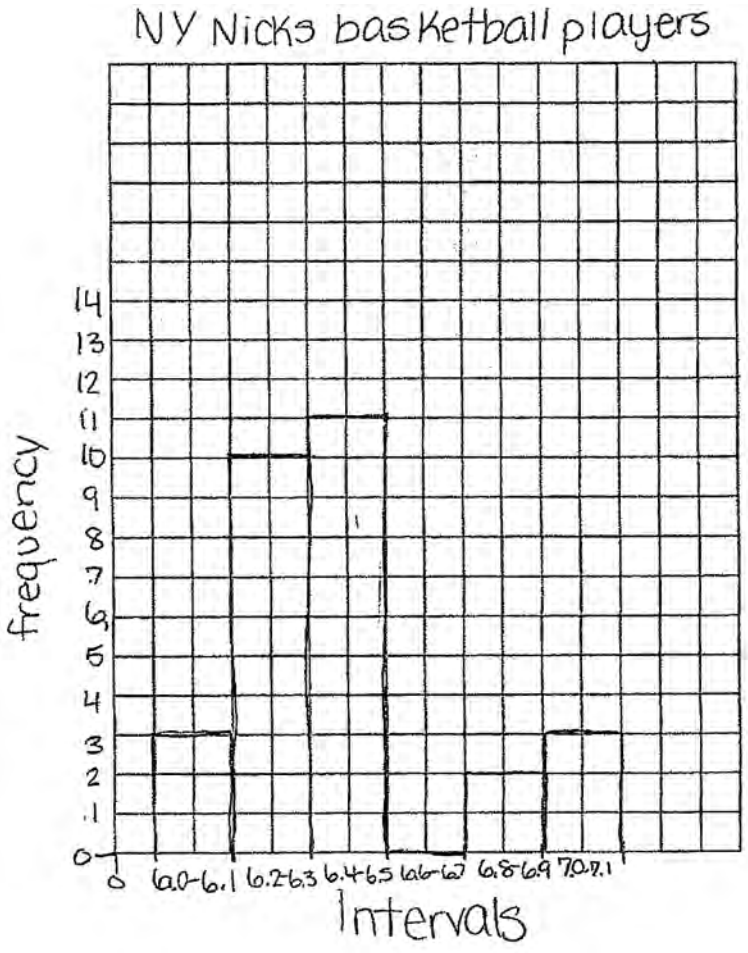
6.4	6.9	6.3	6.2	6.3	6.0	6.1	6.3	6.8	6.2
6.5	7.1	6.4	6.3	6.5	6.5	6.4	7.0	6.4	6.3
6.2	6.3	7.0	6.4	6.5	6.5	6.5	6.0	6.2	

Using the heights given, complete the frequency table below.

Interval	Frequency
6.0 – 6.1	𝍸 |
6.2 – 6.3	𝍸 𝍸 |
6.4 – 6.5	𝍸 𝍸 |
6.6 – 6.7	
6.8 – 6.9	||
7.0 – 7.1	|||

Question 34 continued.

Based on the frequency table created, draw and label a frequency histogram on the grid below.



Determine and state which interval contains the upper quartile. Justify your response.

It would be in the 6.0-6.1 interval because the upper quartile is 6.85.

Score 2: The student completed the frequency table correctly and drew a correct histogram.

Question 34

34 The heights, in feet, of former New York Knicks basketball players are listed below.

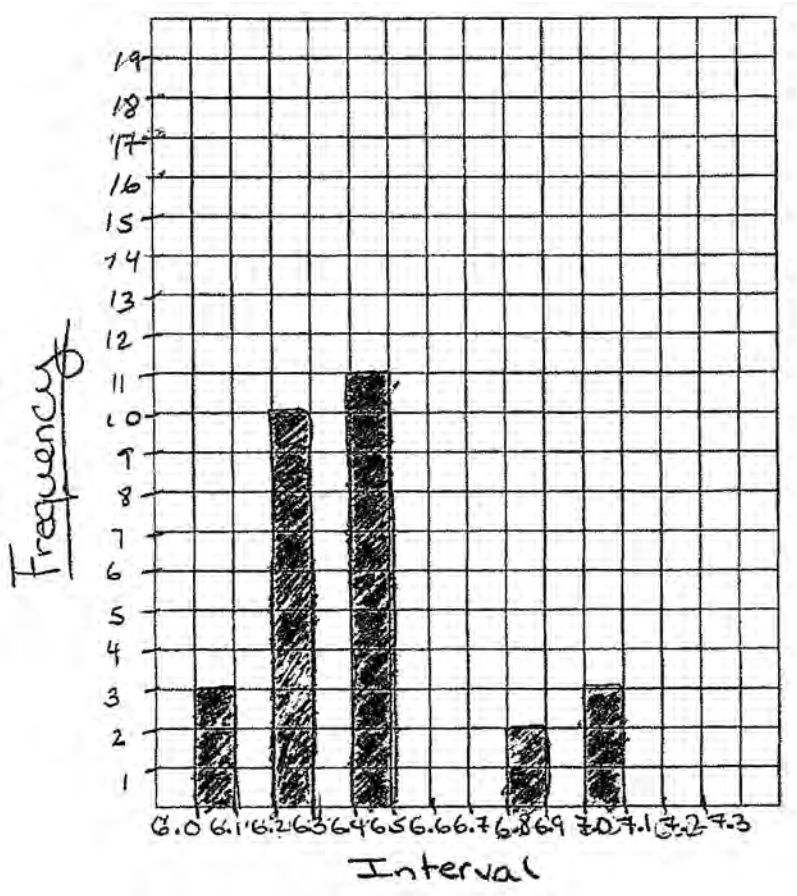
6.4	6.9	6.3	6.2	6.3	6.0	6.1	6.3	6.8	6.2
6.5	7.1	6.4	6.3	6.5	6.5	6.4	7.0	6.4	6.3
6.2	6.3	7.0	6.4	6.5	6.5	6.5	6.0	6.2	

Using the heights given, complete the frequency table below.

Interval	Frequency
6.0 – 6.1	𝍸
6.2 – 6.3	𝍸 𝍸
6.4 – 6.5	𝍸 𝍸 |
6.6 – 6.7	
6.8 – 6.9	||
7.0 – 7.1	𝍸

Question 34 continued.

Based on the frequency table created, draw and label a frequency histogram on the grid below.



Determine and state which interval contains the upper quartile. Justify your response.

Score 1: The student completed the frequency table correctly, but drew a bar graph instead of a histogram.

Question 34

34 The heights, in feet, of former New York Knicks basketball players are listed below.

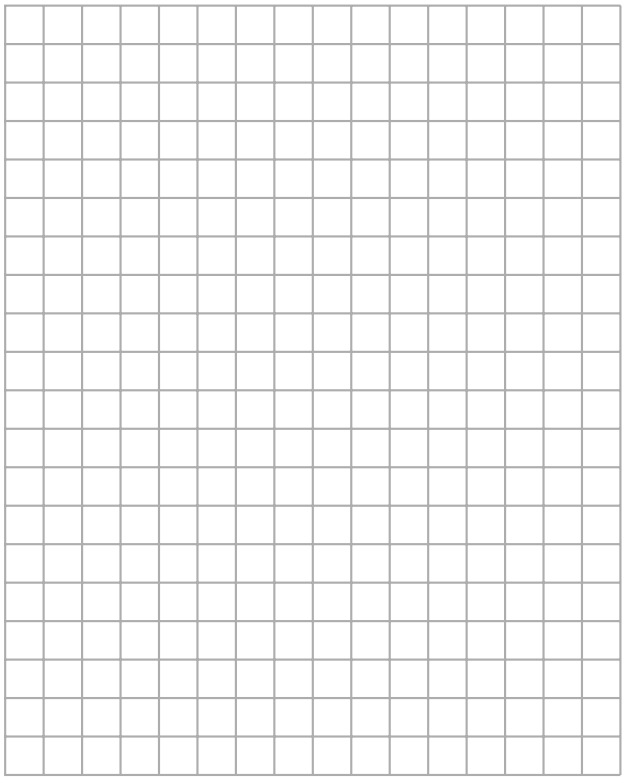
6.4	6.9	6.3	6.2	6.3	6.0	6.1	6.3	6.8	6.2
6.5	7.1	6.4	6.3	6.5	6.5	6.4	7.0	6.4	6.3
6.2	6.3	7.0	6.4	6.5	6.5	6.5	6.0	6.2	

Using the heights given, complete the frequency table below.

Interval	Frequency
6.0 – 6.1	3%
6.2 – 6.3	10%
6.4 – 6.5	11%
6.6 – 6.7	0%
6.8 – 6.9	2%
7.0 – 7.1	3%

Question 34 continued.

Based on the frequency table created, draw and label a frequency histogram on the grid below.



Determine and state which interval contains the upper quartile. Justify your response.

Score 0: The student expressed each frequency as a percent.

Question 34

34 The heights, in feet, of former New York Knicks basketball players are listed below.

6.4	6.9	6.3	6.2	6.3	6.0	6.1	6.3	6.8	6.2
6.5	7.1	6.4	6.3	6.5	6.5	6.4	7.0	6.4	6.3
6.2	6.3	7.0	6.4	6.5	6.5	6.5	6.0	6.2	

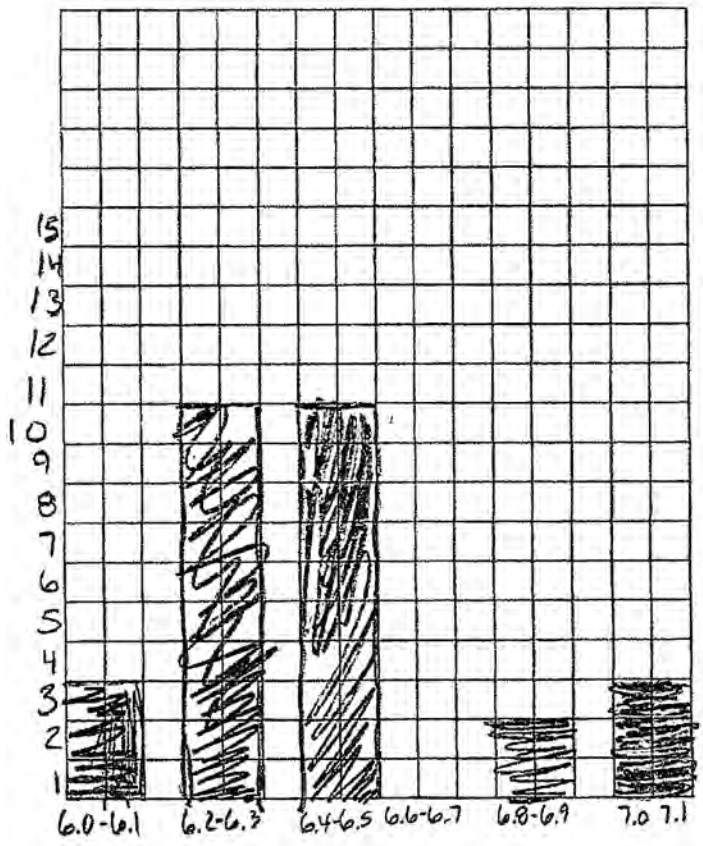
Using the heights given, complete the frequency table below.

Interval	Frequency
6.0 – 6.1	3
6.2 – 6.3	10
6.4 – 6.5	10
6.6 – 6.7	0
6.8 – 6.9	2
7.0 – 7.1	3

6.0, 6.1, 6.2, 6.3, 6.4 | 6.5, 6.8, 6.9, 7.0, 7.1

Question 34 continued.

Based on the frequency table created, draw and label a frequency histogram on the grid below.



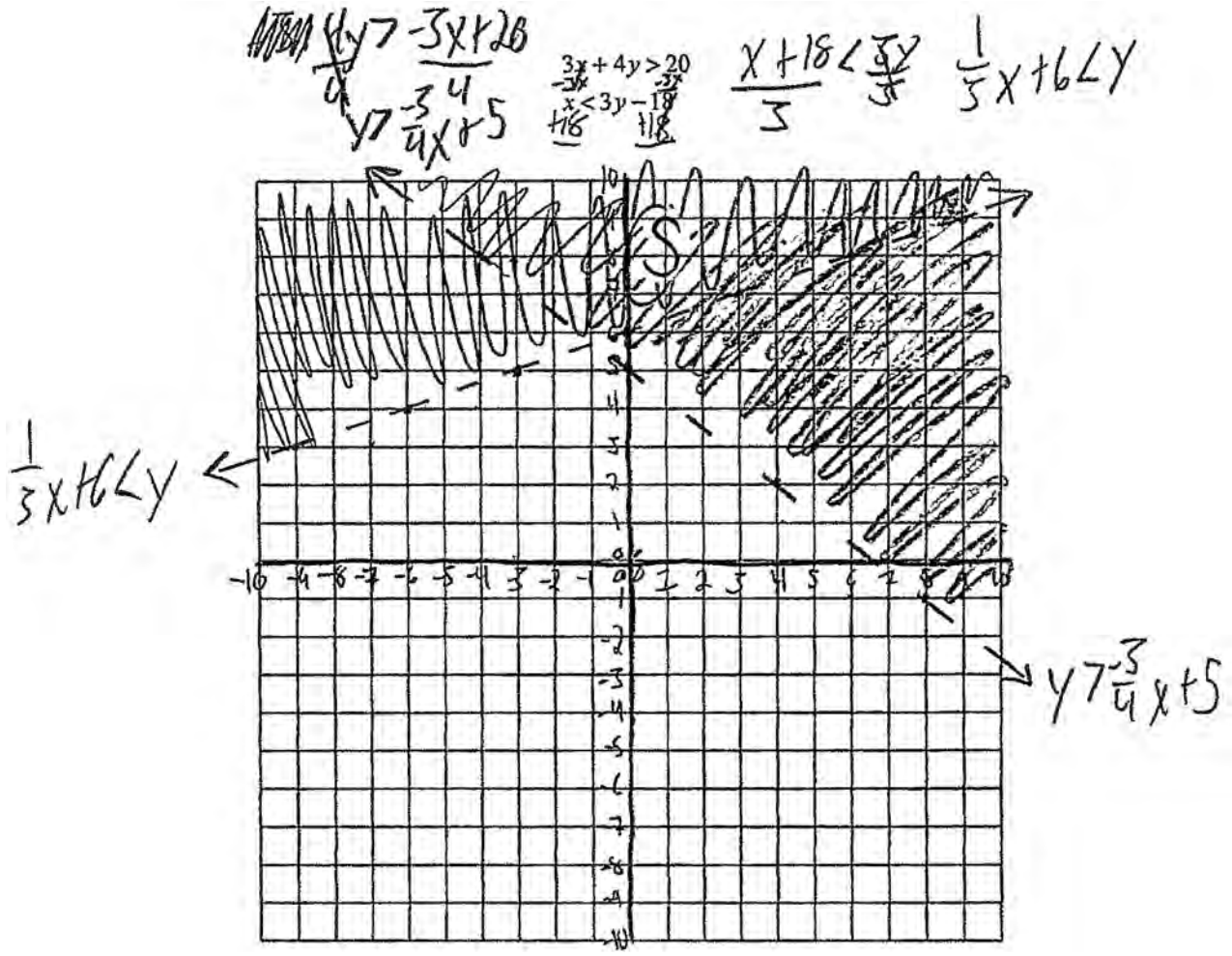
Determine and state which interval contains the upper quartile. Justify your response.

6.2-6.3
&
6.4-6.5

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

Question 35

35 Solve the following system of inequalities graphically on the grid below and label the solution *S*.



Is the point (3,7) in the solution set? Explain your answer.

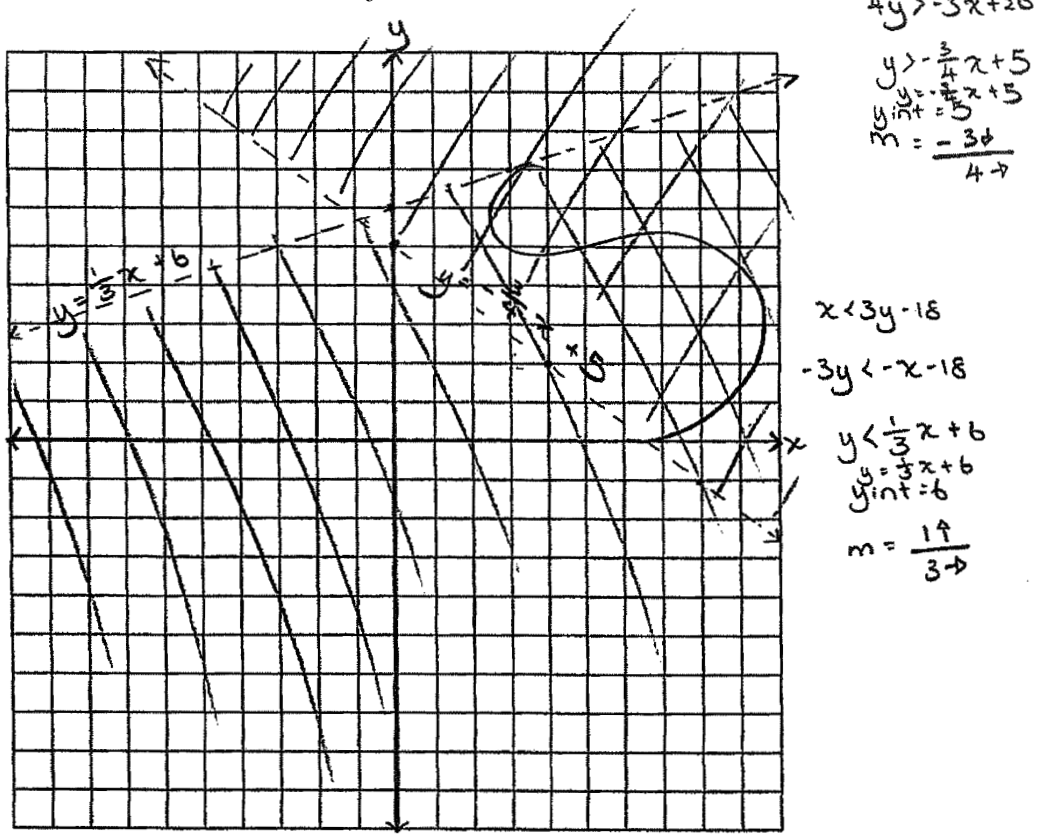
No, because it's on the line and it's only a more than not a more than or equal to, so it's not included.

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

Question 35

35 Solve the following system of inequalities graphically on the grid below and label the solution *S*.

$$3x + 4y > 20$$
$$x < 3y - 18$$



Is the point (3,7) in the solution set? Explain your answer.

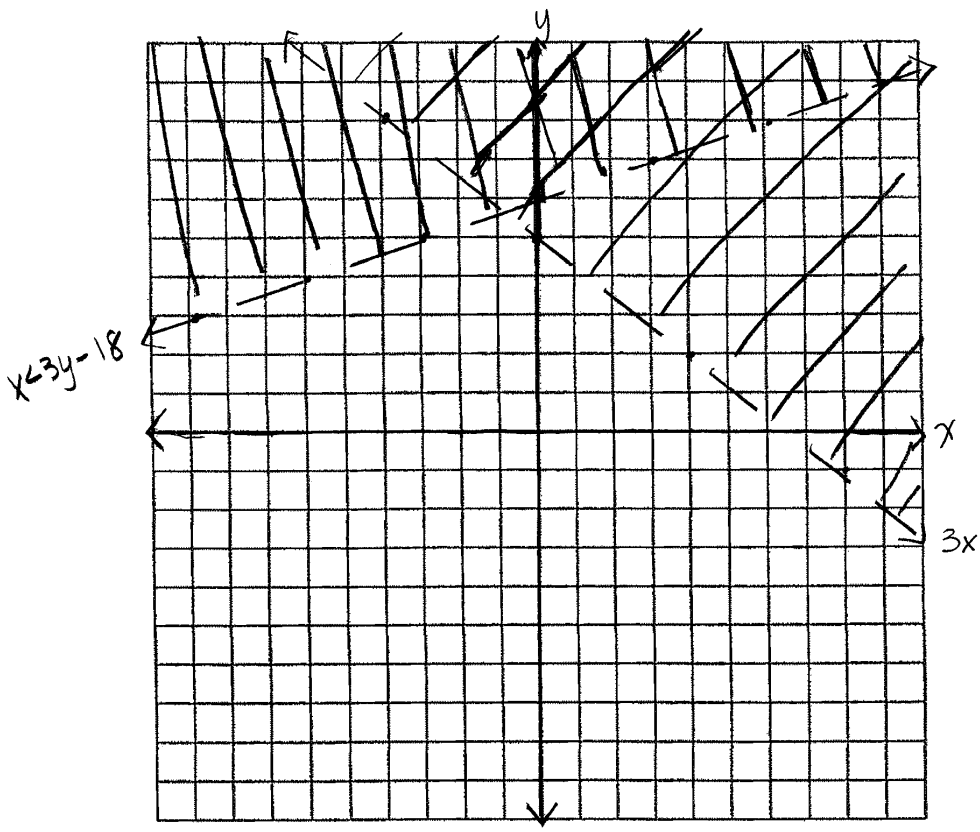
No, because point (3,7) is on the line of $y=\frac{1}{3}x+6$, but the original equation is $y<\frac{1}{3}x+6$ which solutions are not including the points on it's line.

Score 3: The student did not reverse the inequality symbol when dividing by a negative.

Question 35

35 Solve the following system of inequalities graphically on the grid below and label the solution S.

$$3x + 4y > 20$$
$$x < 3y - 18$$



$3x+4y>20$
$4y>-3x+20$
$y>\frac{-3}{4}x+5$

$x<3y-18$
$3y-18>x$
$3y>x+18$
$y>\frac{1}{3}x+6$

Is the point (3,7) in the solution set? Explain your answer.

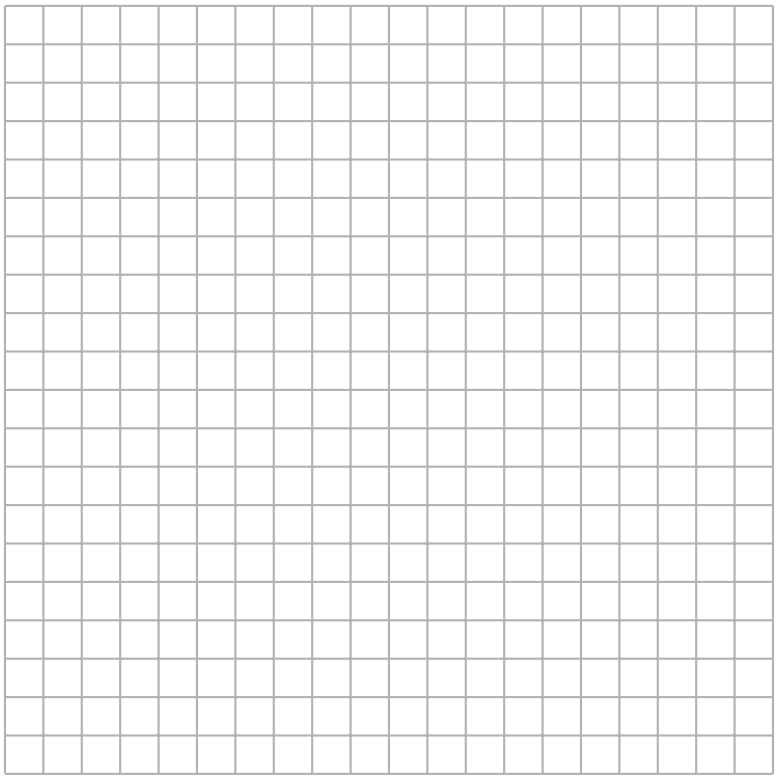
yes because the point is on the line

Score 2: Appropriate work is shown, but the solution is not labeled and an incorrect explanation is written.

Question 35

35 Solve the following system of inequalities graphically on the grid below and label the solution *S*.

$$3x + 4y > 20$$
$$x < 3y - 18$$



Is the point (3,7) in the solution set? Explain your answer.

$3(3)+4(7)>20$
$9+28>20$
$27>20$ ✓

$3<3(7)-16$
$3<21-18$
$3<3$
X

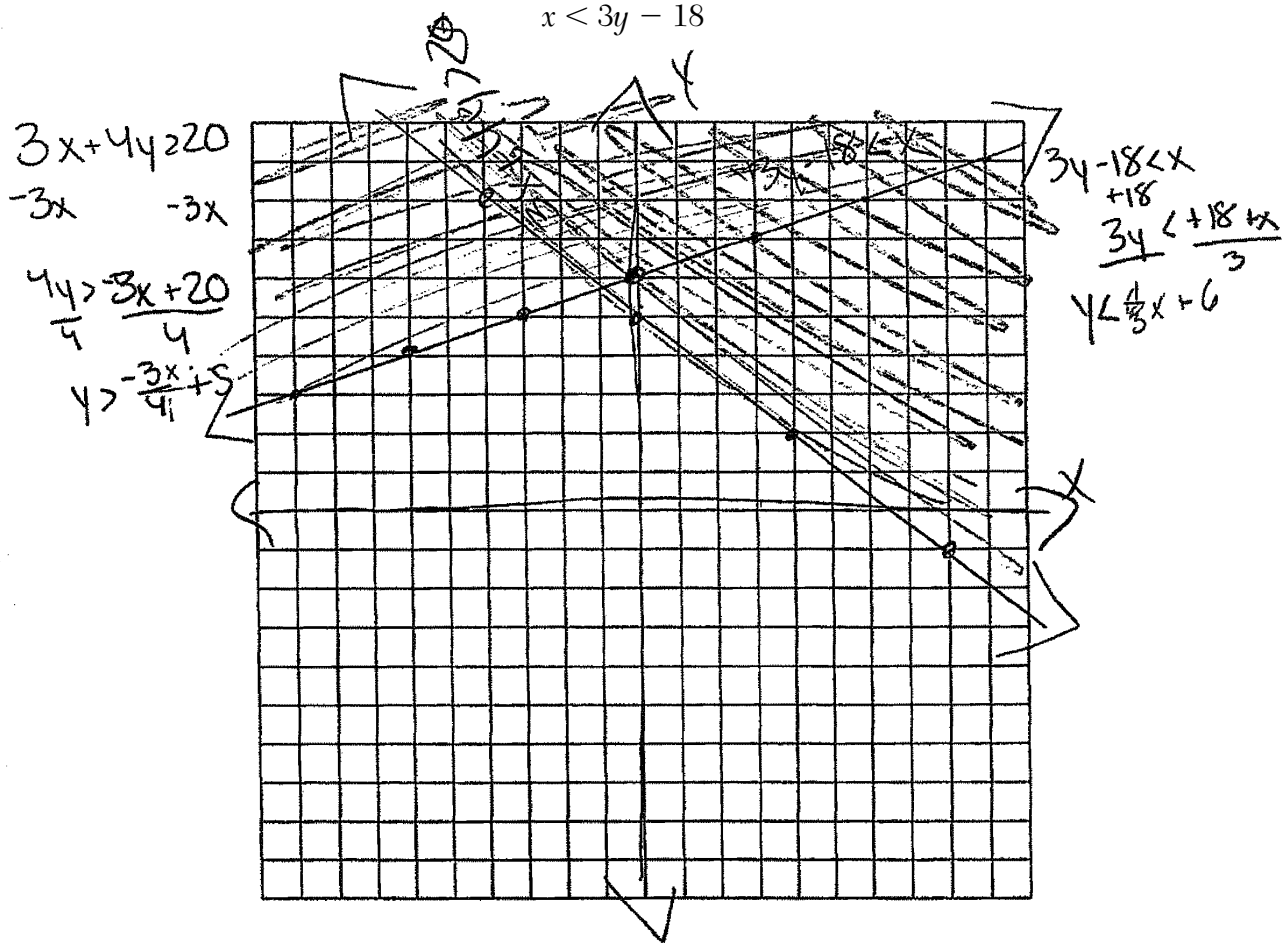
No, because it doesn't support the inequality

Score 1: The student wrote a correct explanation based on an algebraic justification.

Question 35

35 Solve the following system of inequalities graphically on the grid below and label the solution *S*.

$$3x + 4y > 20$$
$$x < 3y - 18$$



Is the point (3,7) in the solution set? Explain your answer.

No, because points on each line are not included in the answer.

Score 1: The student graphed both inequalities using solid lines and did not label the solution set. The explanation is incorrect based on their graph.

Question 35

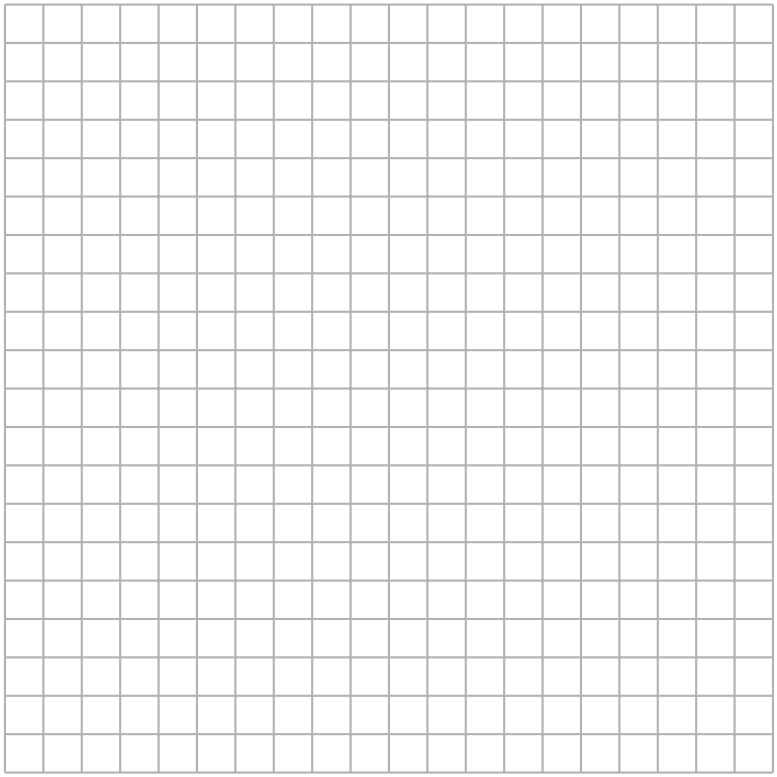
35 Solve the following system of inequalities graphically on the grid below and label the solution S.

$3x + 4y > 20$

$x < 3y - 18$

$3x+4y>20$
$-3x+4 \quad -3x+4$
$y>-3x+24$

$x<3y-18$
$+18 \quad +18$
$3x+18<3y \cdot 3$
$3x+18<y$



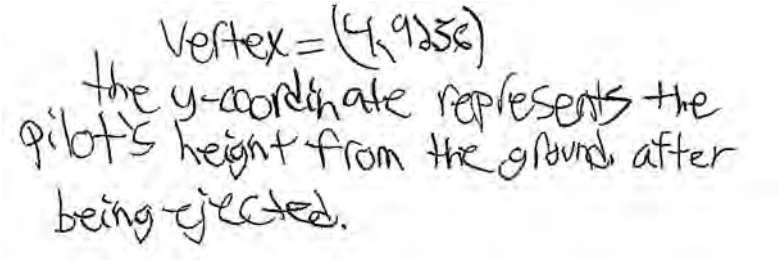
Is the point (3,7) in the solution set? Explain your answer.

Score 0: The student did not show any correct work.

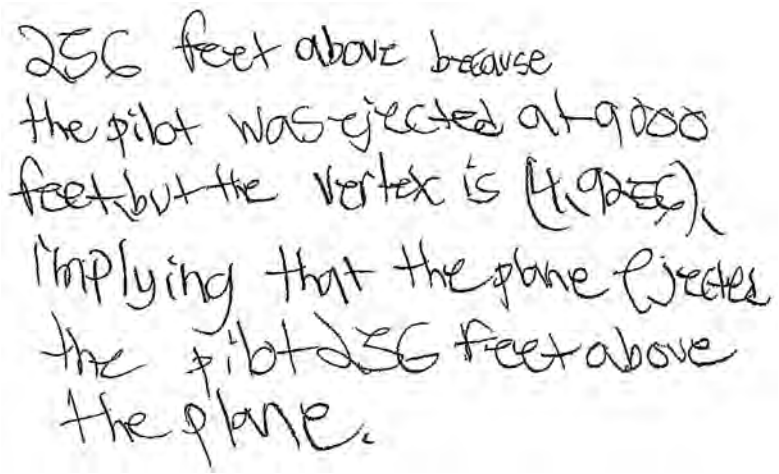
Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.



After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.



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

Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.

(4, 9,256)

The peak of the pilot's height above the ground after ejection from the plane.

After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.

256 Ft.

9256
−9,000
256

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

Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.

$-16t^2+128t+9000=h(t)$

$\frac{-b}{2a}=\frac{-(128)}{2(-16)}=\frac{-128}{-32}=4$

$-16(4)^2+128(4)+9000=h(t)$

$9256=h(t)$

$(4, 9256)$

y-coordinate represents highest point where the aircraft will be in ft.

After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.

256 because $9256-9000=256$

Score 3: The student wrote an incorrect explanation.

Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.

(4, 9256). Y-coordinate is how high she is off the ground

After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.

9256, it is the vertex

Score 2: The student stated a correct vertex and wrote a correct explanation.

Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.

$h(t) = -16t^2 + 128t + 9000$

$V = \frac{-b}{2a}$

$h(4) = -16(4)^2 + 128(4) + 9000$

$h(4) = -256 + 512 + 9000$

$V = \frac{-128}{2(-16)} = \frac{128}{32} = 4$

(9256, 4)

After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.

9256
-9000
256 feet

Score 2: The student stated the vertex incorrectly and wrote no explanation.

Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.

(4, 9256) THE y-COORDINATE IS THE HEIGHT

After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.

$-16(4)^2 + 128(4) + 9000$

$-16(16) + 512 + 9000$

$-256 + 9512$

9256

Score 1: The student stated the vertex correctly, but did not write an explanation in the context of the problem.

Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.

(9256, 4)

After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.

256

Score 1: The student stated 256, but did not show a justification.

Question 36

36 An Air Force pilot is flying at a cruising altitude of 9000 feet and is forced to eject from her aircraft. The function $h(t) = -16t^2 + 128t + 9000$ models the height, in feet, of the pilot above the ground, where t is the time, in seconds, after she is ejected from the aircraft.

Determine and state the vertex of $h(t)$. Explain what the second coordinate of the vertex represents in the context of the problem.

$-16x^2+128x+900$

Vertex: 4

The y coordinate represents the height ejected from.

After the pilot was ejected, what is the maximum number of feet she was above the aircraft's cruising altitude? Justify your answer.

9000 feet.

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

Question 37

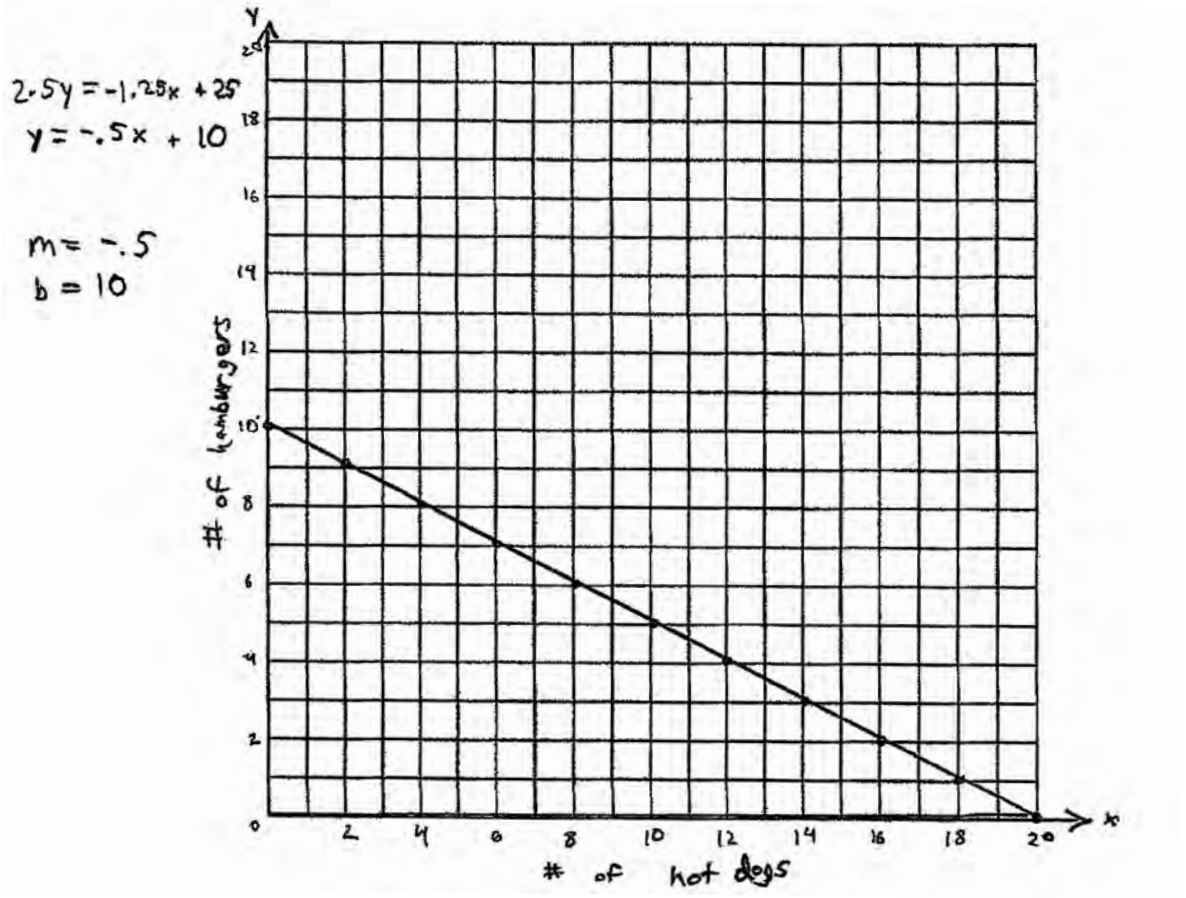
37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy.

$28.5 - 3.5 = 25$

$25 = 1.25x + 2.5y$

Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

There are 11 different combinations because each dot on the above graph represents one combination

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

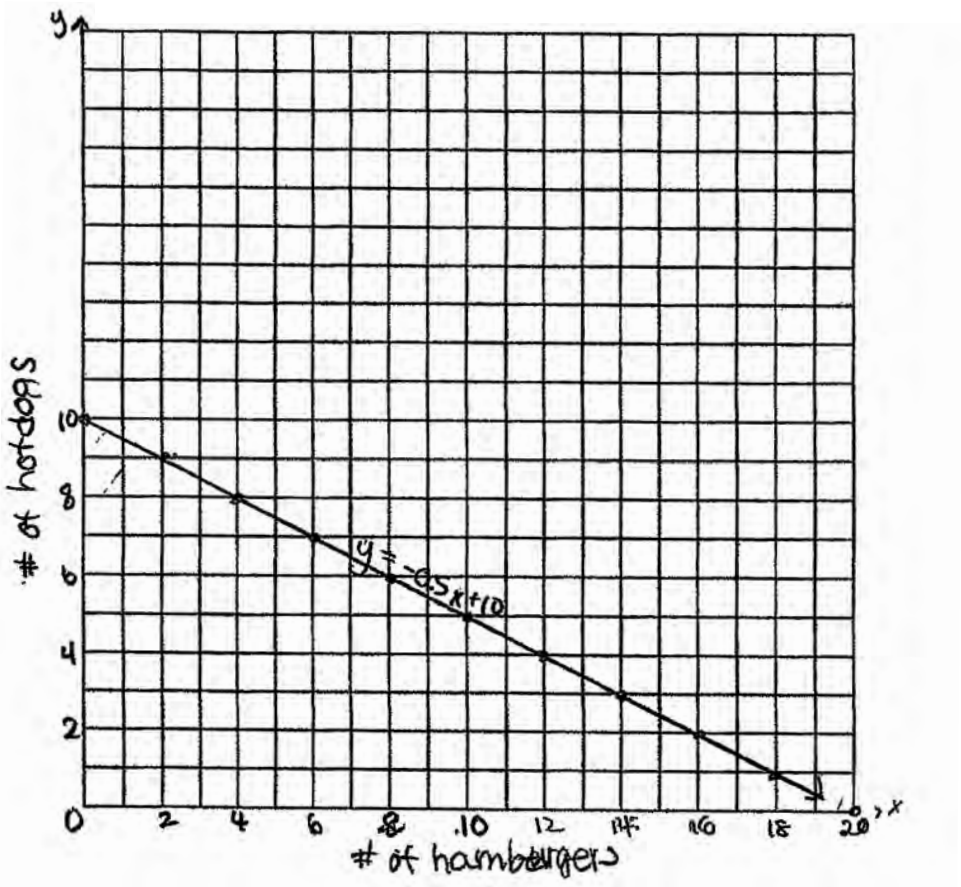
Question 37

37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy. $1.25x + 2.5y = 28.5 - 7(.50)$

$\hookrightarrow 1.25x + 2.5y = 25 \rightarrow y = -0.5x + 10$

Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

There are 11 different combinations because there are 11 different whole number points drawn in the graph.

Score 5: The student labeled the axes incorrectly.

Question 37

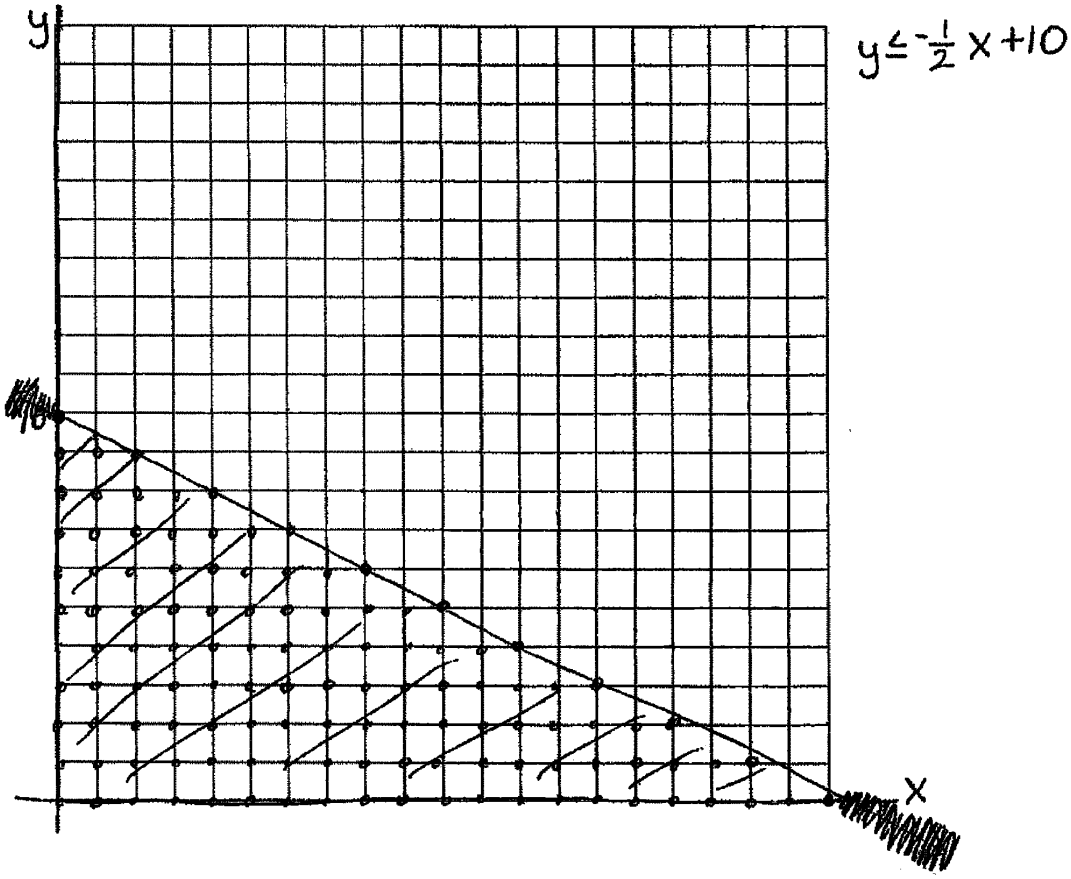
37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy.

$1.25x + 2.50y + 3.50 \leq 28.50$

$1.25x + 2.50y \leq 25$

Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

121 combinations because any integer solution in my solution set will work

Score 5: The student made an error by using an inequality to model the scenario.

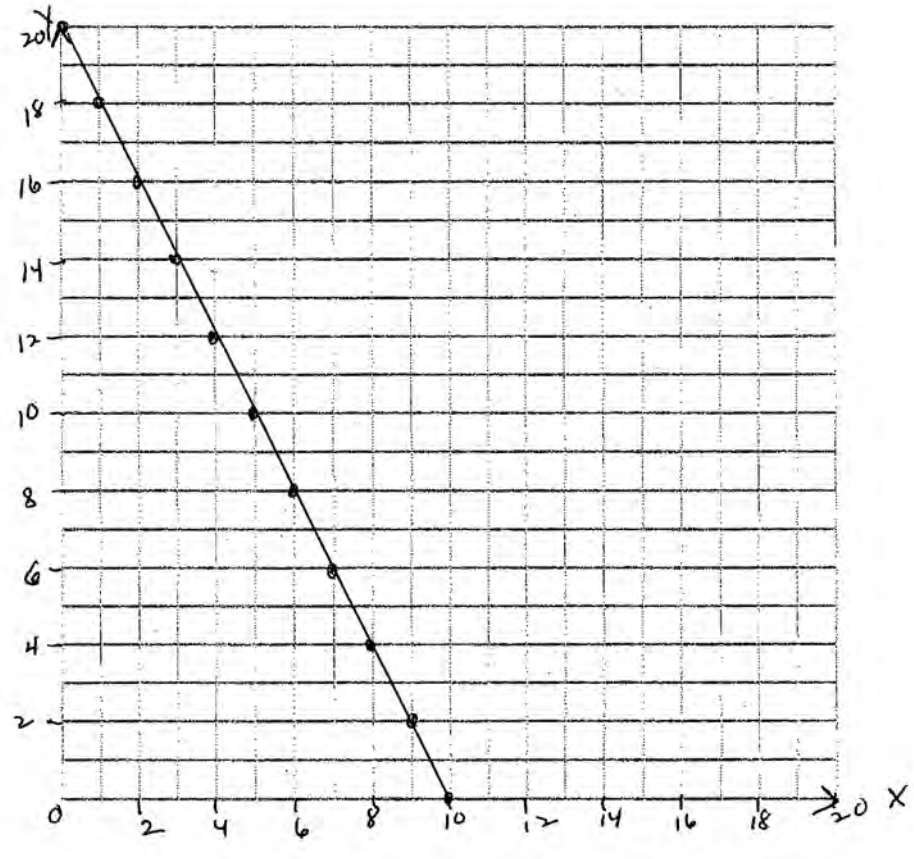
Question 37

37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy.

$2.5x + 1.25y = 25$

Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

If each dot on the line is a combination that works

Score 5: The student made a transcription error by reversing the x and y when writing the equation. All other work was appropriate.

Question 37

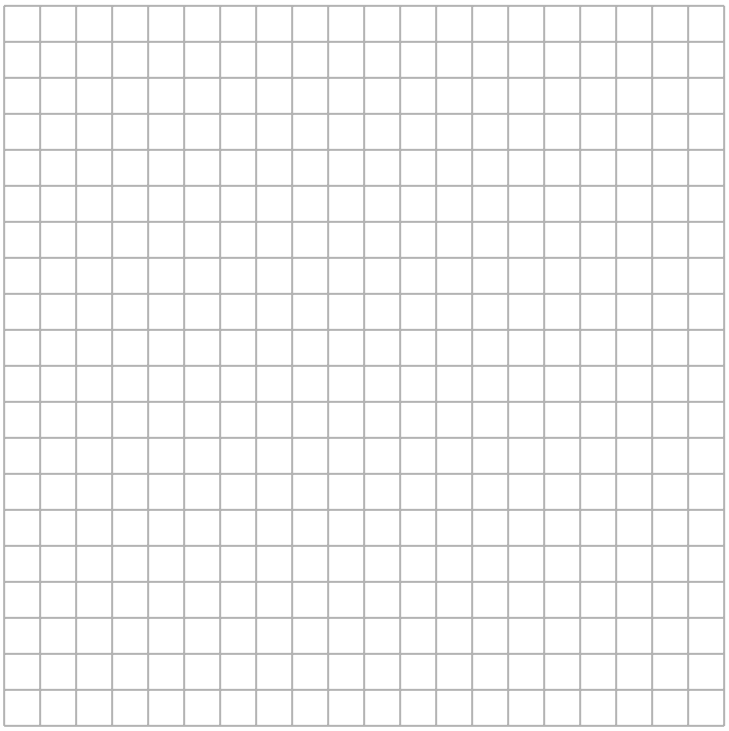
37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy.

$1.25x + 2.50y + 3.50 = 28.50$

$1.25x + 2.50y = 25.00$

Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

dogs burgers

$1.25x + 2.50y = 25$

$1.25(20) + 2.50(0) = 25$

$1.25(18) + 2.50(1) = 25$

$1.25(16) + 2.50(2) = 25$

$1.25(14) + 2.50(3) = 25$

$1.25(12) + 2.50(4) = 25$

$1.25(10) + 2.50(5) = 25$

$1.25(8) + 2.50(6) = 25$

$1.25(6) + 2.50(7) = 25$

$1.25(4) + 2.50(8) = 25$

$1.25(2) + 2.50(9) = 25$

$1.25(0) + 2.50(10) = 25$

All these combinations worked. There are 11

Burgers cost twice as much as a hot dog so it takes 2 hot dogs to make up for the cost of a burger. I tried 20 hot dogs and no burgers and it worked. I went down by 2 hot dogs and up 1 burger each time. See my work.

Score 4: The student wrote a correct equation and used it to determine the number of combinations. The student wrote an explanation.

Question 37

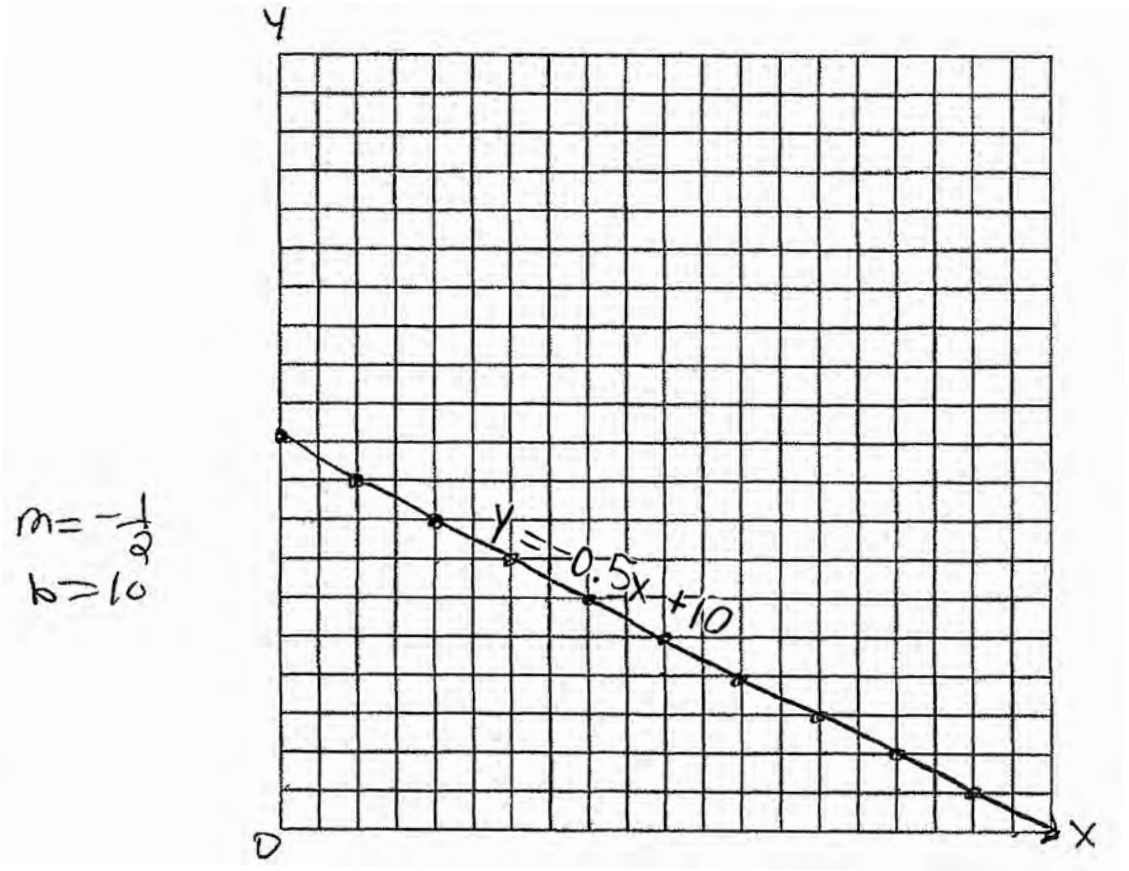
7 people

37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy. $28.50 \geq 0.50(7) + 1.25x + 2.50y$

$25 \geq 1.25x + 2.50y$

Graph your equation on the grid below.



$m = -\frac{1}{2}$

$b = 10$

Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

7·22

28 different combinations. these are 7 friends and two options for two items.

Score 3: The student made an error by using an inequality to model the scenario. The student graphed the correct equation.

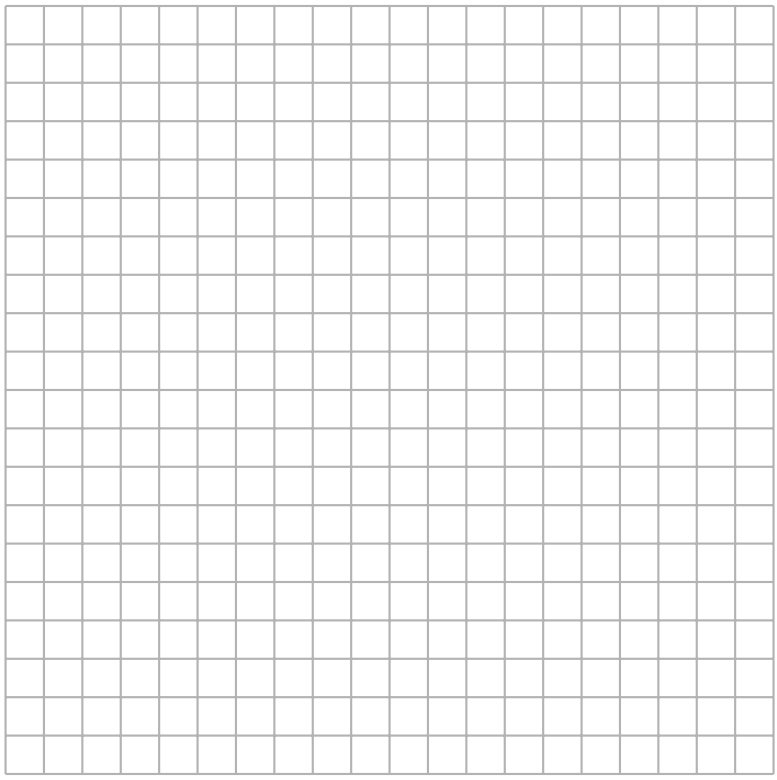
Question 37

37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy.

$1.25x + 2.5y = 25$

Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

Score 2: The student wrote a correct equation.

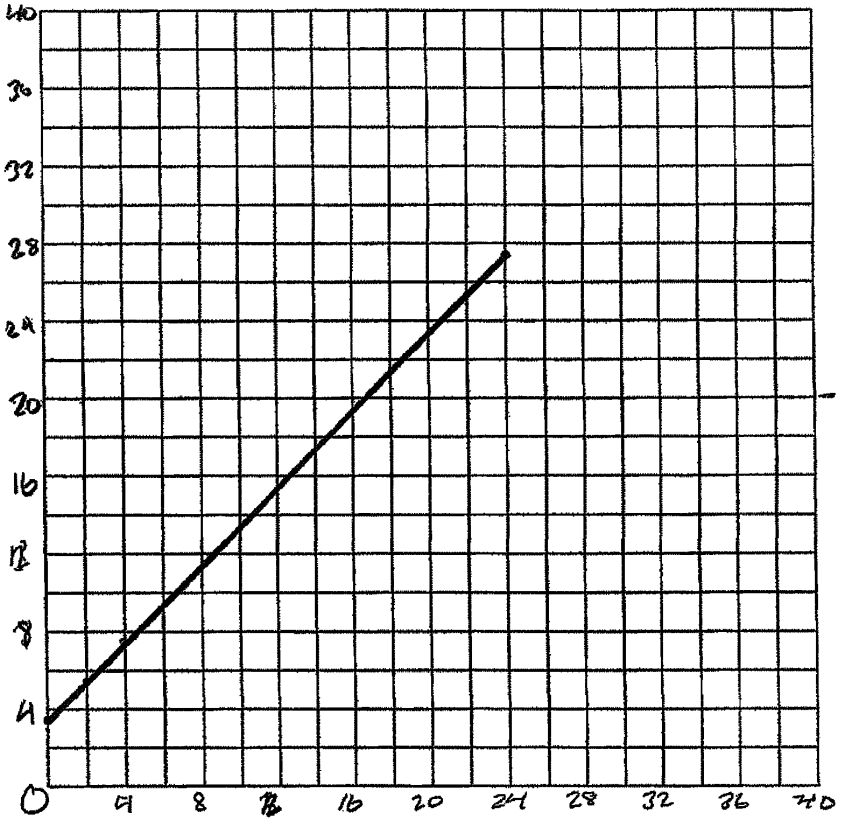
Question 37

37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy.

$y = x + 3.5$

Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

28.5
- 3.5
25

2.5
11.25

2 hotdogs = 1 burger

11 combinations.

20 hotdogs : 0 burgers
18 hotdogs : 1 burger
16 hotdogs : 2 burgers
14 hotdogs : 3 burgers
12 hotdogs : 4 burgers
10 hotdogs : 5 burgers

8 : 6
6 : 7
4 : 8
2 : 9
0 : 10

Score 1: The student wrote a justification for 11, not an explanation.

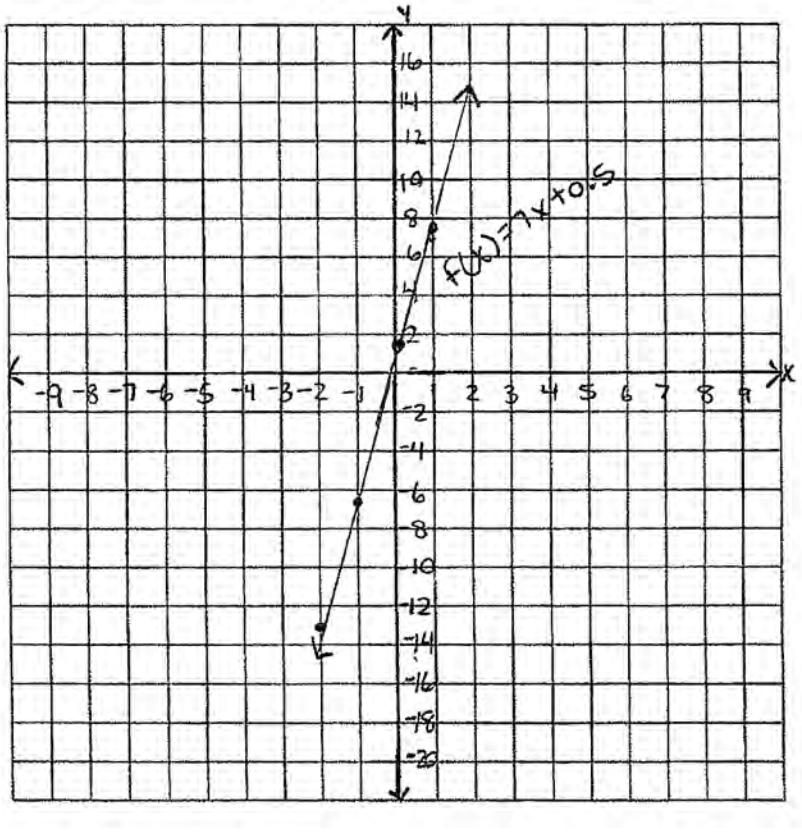
Question 37

37 Zeke and six of his friends are going to a baseball game. Their combined money totals $28.50. At the game, hot dogs cost $1.25 each, hamburgers cost $2.50 each, and sodas cost $0.50 each. Each person buys one soda. They spend all $28.50 on food and soda.

Write an equation that can determine the number of hot dogs, x, and hamburgers, y, Zeke and his friends can buy.

$F(x)=7x+0.50$

Graph your equation on the grid below.



x	y
-2	-13.5
-1	-6.5
0	0.5
1	7.5
2	14.5

Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spendng all $28.50. Explain your answer.

$1.25(7)+2.50(7)=26.25$

Each person can buy one hotdog and one hamburger to come up with a total of $26.25.

Score 0: The student did not show any correct work.