The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Tuesday, June 12, 2018 — 1:15 to 4:15 p.m.

MODEL RESPONSE SET

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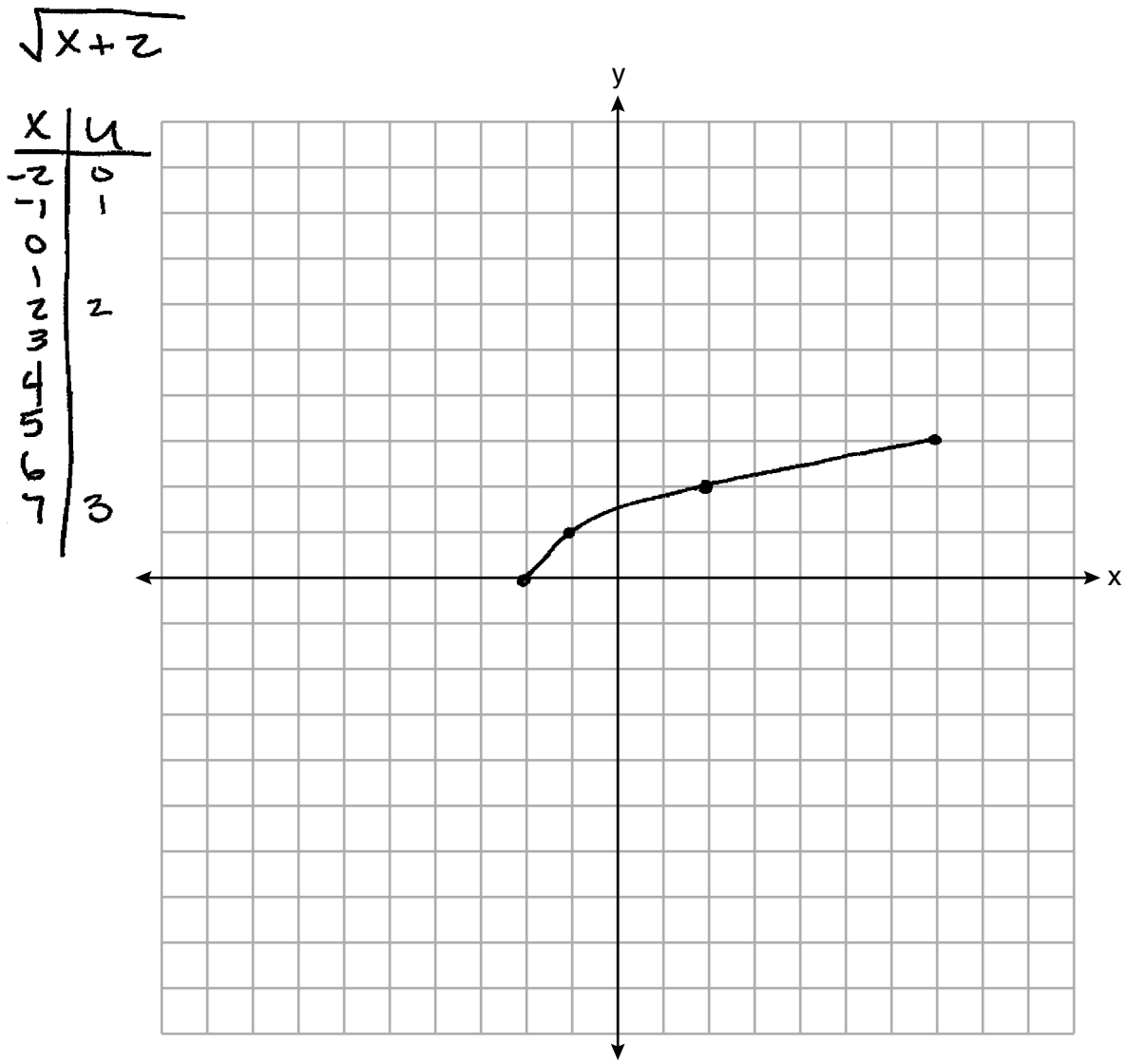
Question 25

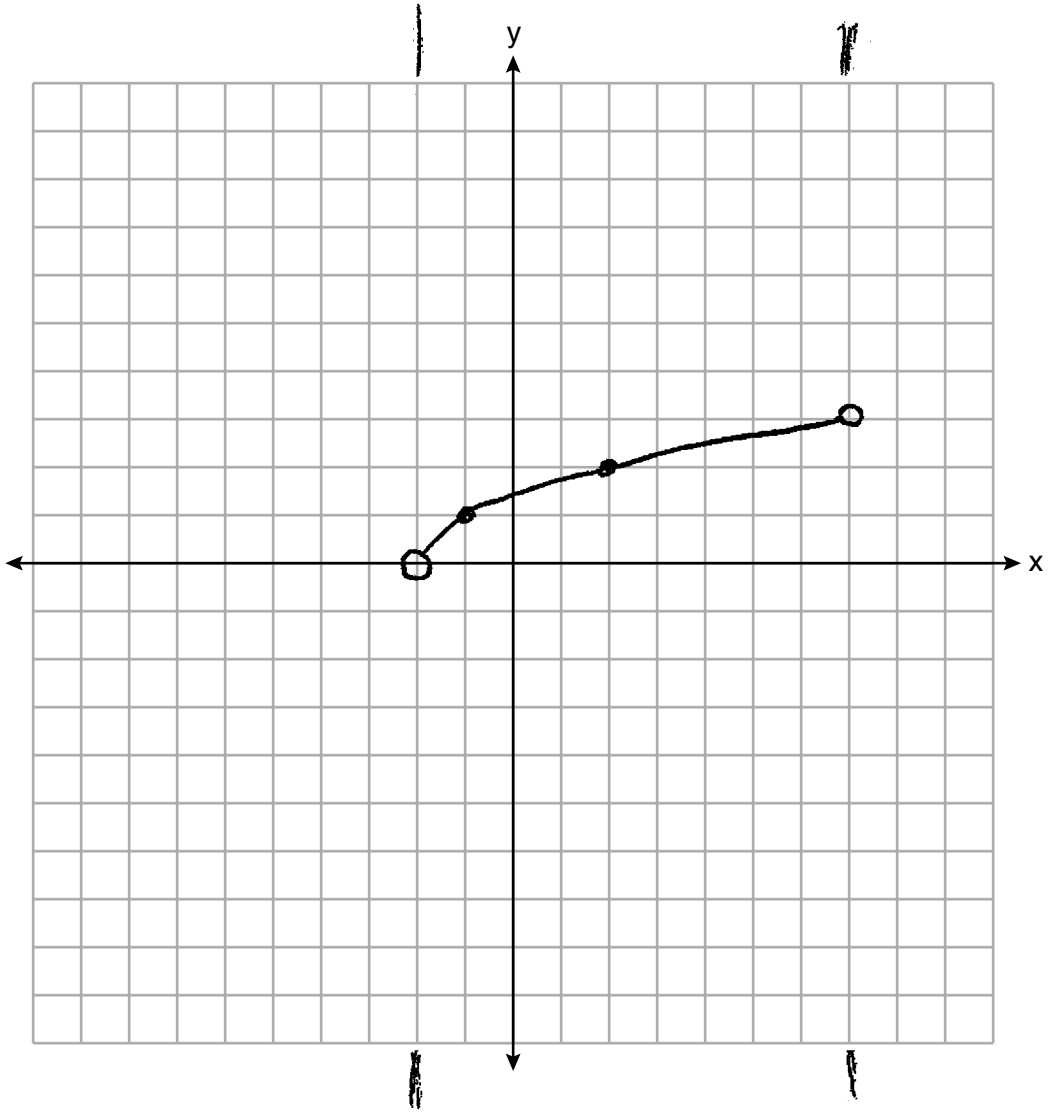
25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.



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

Question 25

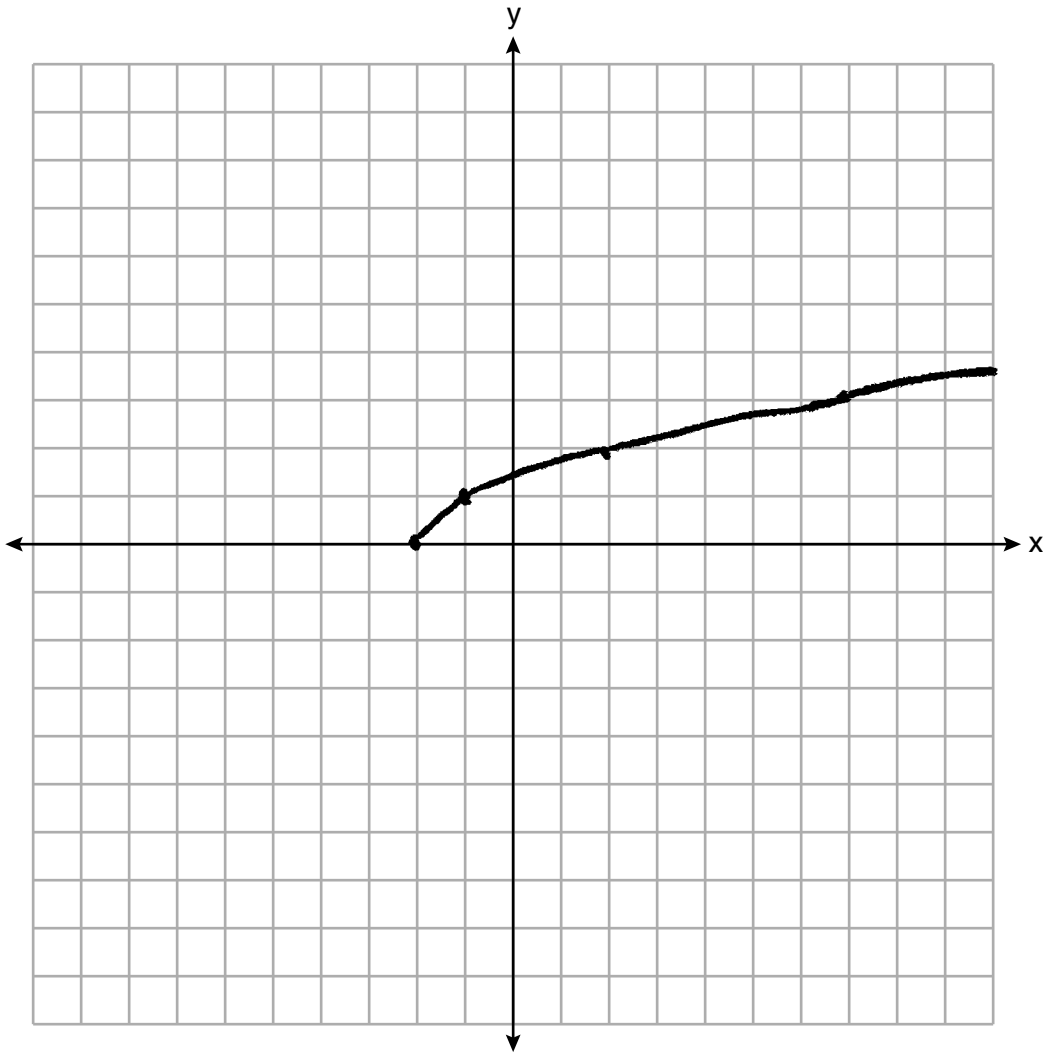
25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.



Score 1: The student graphed $-2 < x < 7$.

Question 25

25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.

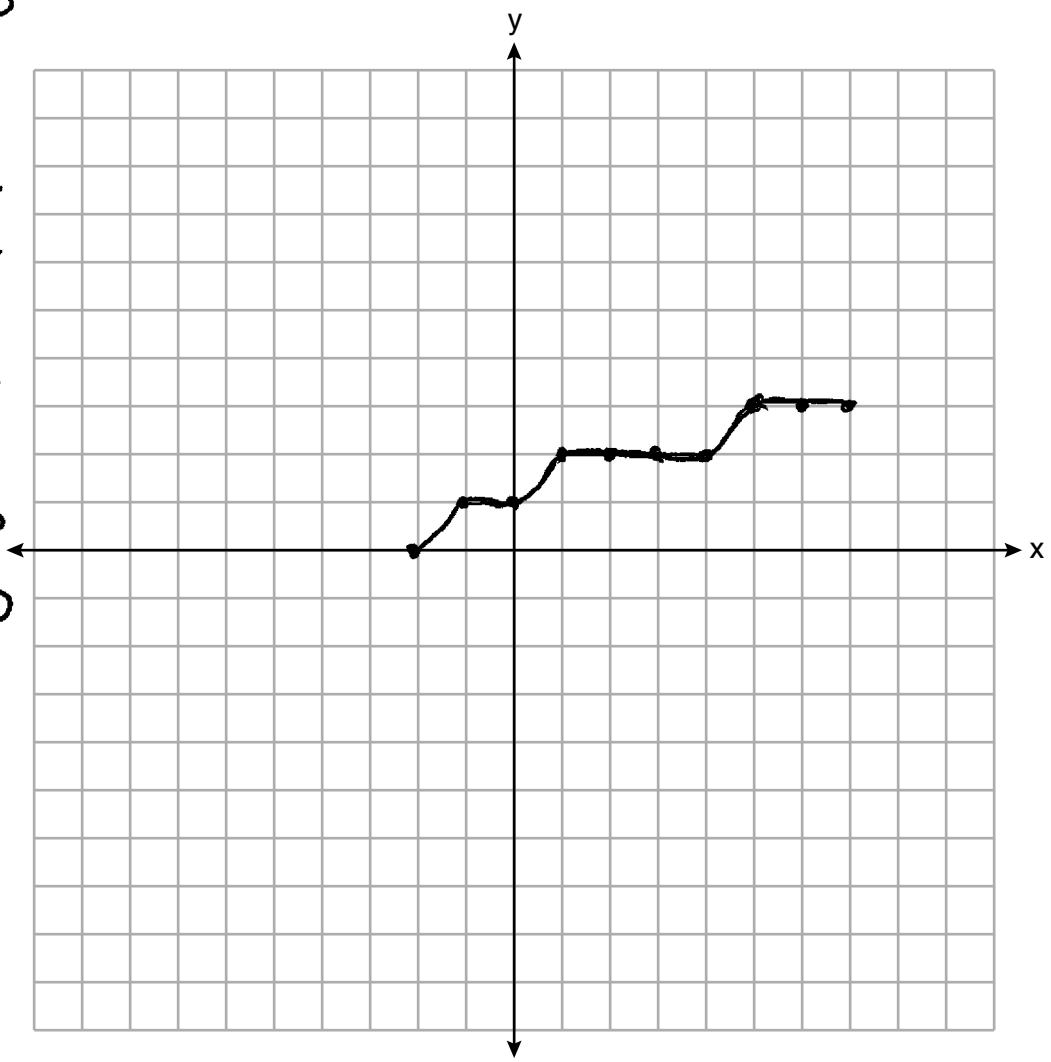


Score 1: The student graphed beyond $x = 7$.

Question 25

25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.

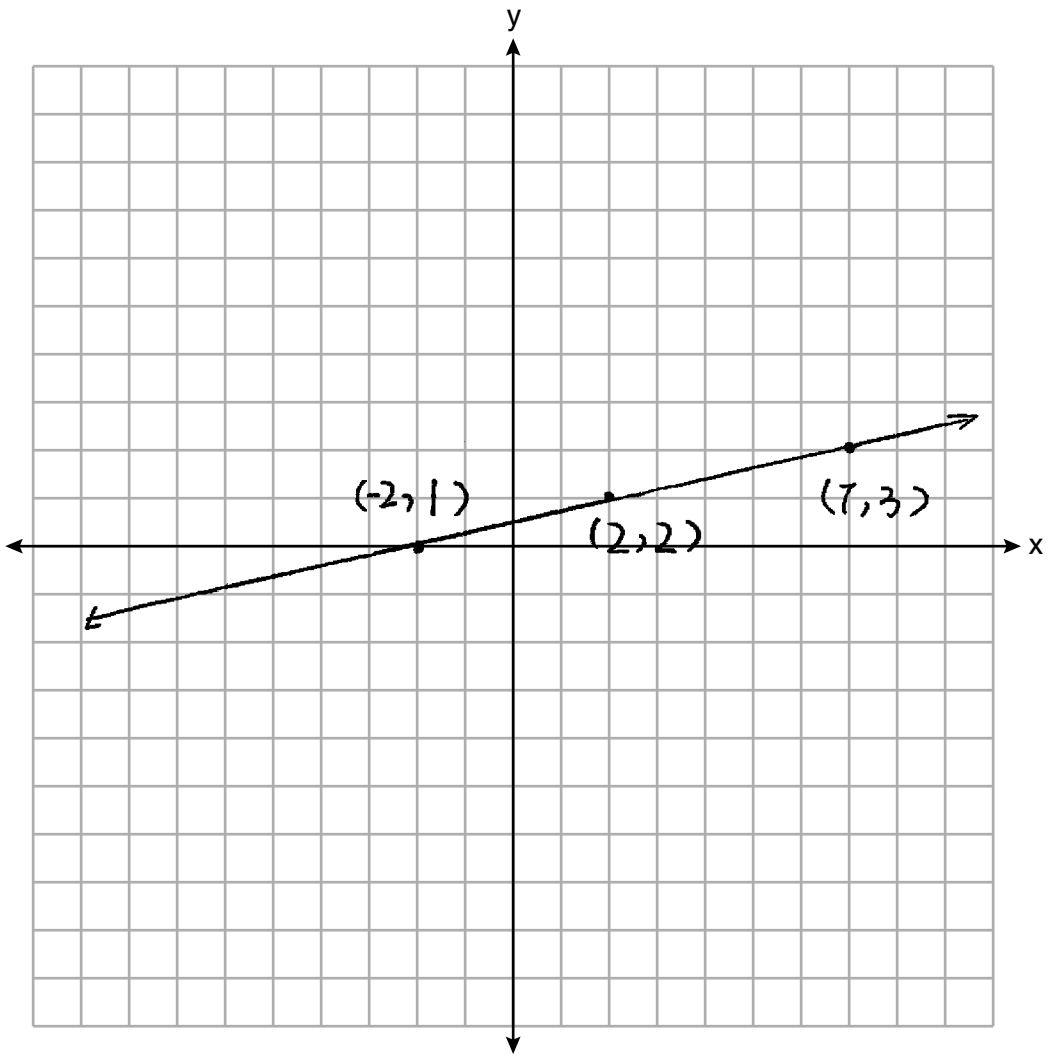
X	Y
-2	0
-1	1
0	1
1	2
2	2
3	2
4	2
5	3
6	3
7	3



Score 1: The student rounded values when completing their chart, but drew an appropriate graph.

Question 25

25 Graph $f(x) = \sqrt{x+2}$ over the domain $-2 \leq x \leq 7$.



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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)	
0	2 x2	+2
1	4 x2	+6
2	8 x2	+8
3	16	

State if Caleb is correct. Explain your reasoning.

Caleb is correct. According to the data table, f(x) was increasing by multiplying by two.

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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

+2
+4
+8

State if Caleb is correct. Explain your reasoning.

Caleb is correct because there is not a constant rate of change.

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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.

Caleb is correct because the equation for this table is $f(x) = 2^{x+1}$, which is not a line

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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.

$y = 2(2)^x$ yes caleb is correct

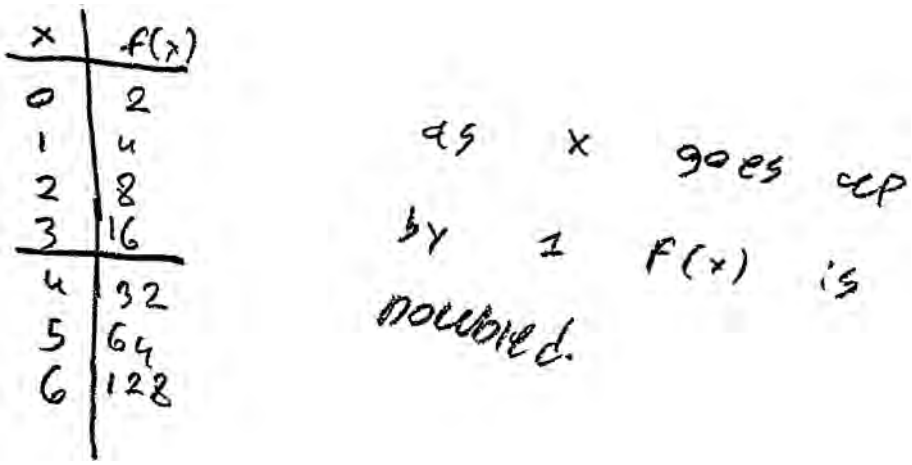
Score 1: The student gave a correct justification, but did not write an explanation.

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.



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

Question 26

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

Determination.

x	f(x)
0	2
1	4
2	8
3	16

+1 +1 +1

+2 +4 +8

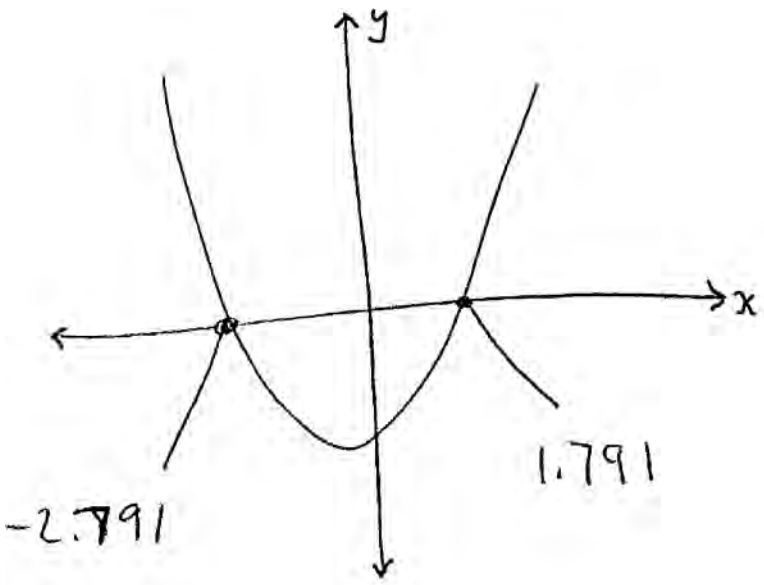
State if Caleb is correct. Explain your reasoning.

Caleb is not correct because there is no constant slope nor is there a relationship between x and f(x)

Score 0: The student contradicted their negative response in the first part of their explanation. The remainder of the explanation is incorrect.

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.



$X = -2.8 \quad X = 1.8$

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

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.

$a = 1$

$b = 1$

$c = -5$

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(1)(-5)}}{2}$$

$$x = \frac{-1 \pm \sqrt{1 + 20}}{2}$$

$$x = \frac{-1 \pm \sqrt{21}}{2}$$

$x = 1.8$

$x = -2.8$

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

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.

$x^2 + x = 5$

$a = 1$
$b = 1$
$c = -5$

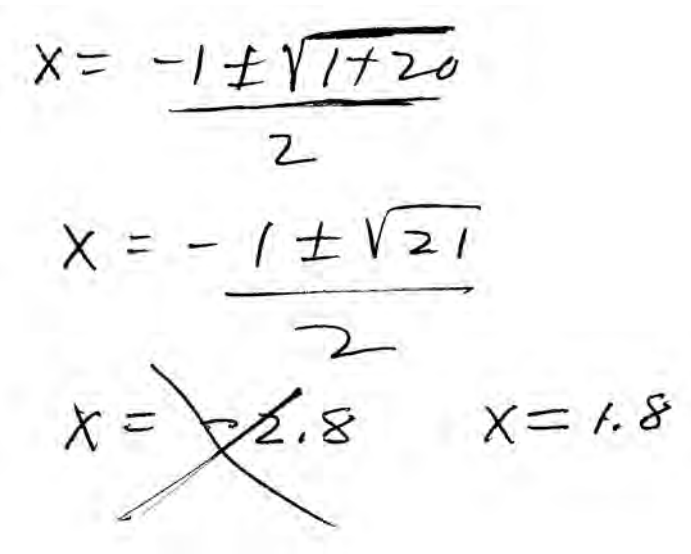
$$\frac{-1 \pm \sqrt{1^2 - 4(1)(-5)}}{2(1)}$$

$$\frac{-1 \pm \sqrt{21}}{2}$$

Score 1: The student did not give their answer as a decimal rounded to the nearest tenth.

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.



Score 1: The student gave one correct response.

Question 27

27 Solve for x to the *nearest tenth*: $x^2 + x - 5 = 0$.

$x^2+x-5=0$

$(x+5)(x-1)=0$

$x+5=0$	$x-1=0$
$-5\ -5$	$+1\ +1$
$x=-5$	$x=1$

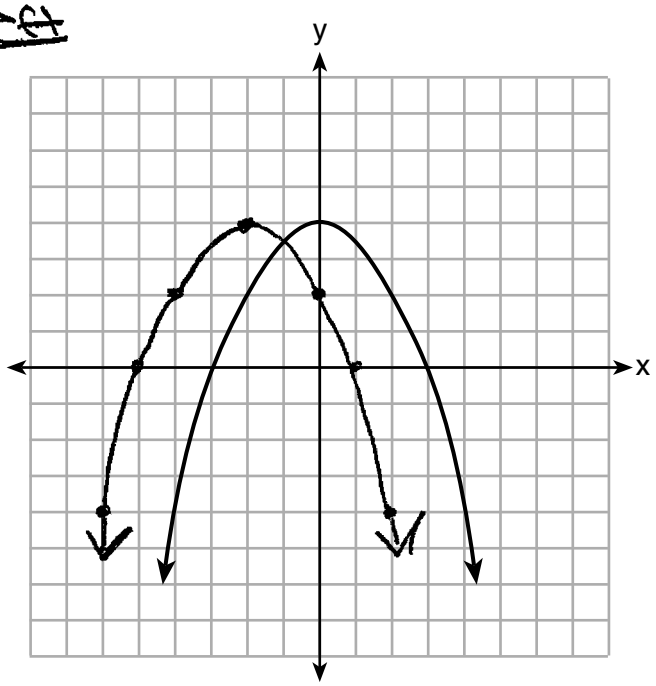
$(-5, 1)$

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

Question 28

28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.

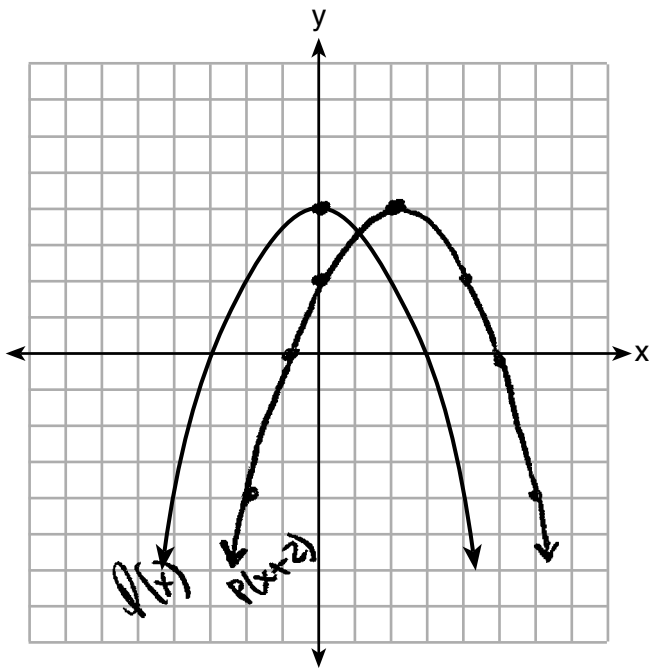
2 to the left

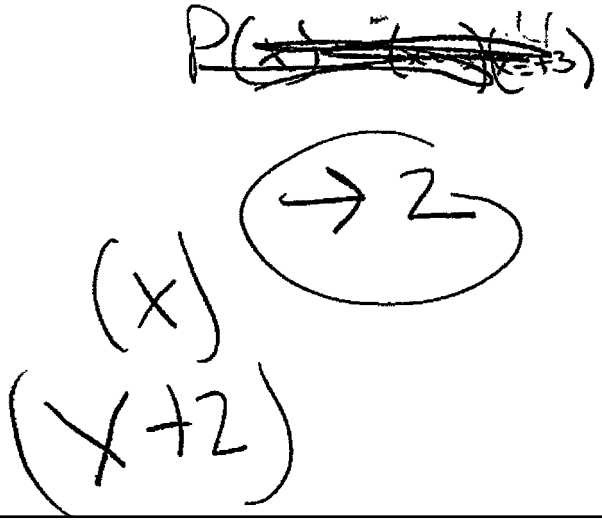


Score 2: The student gave a complete and correct response.

Question 28

28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.

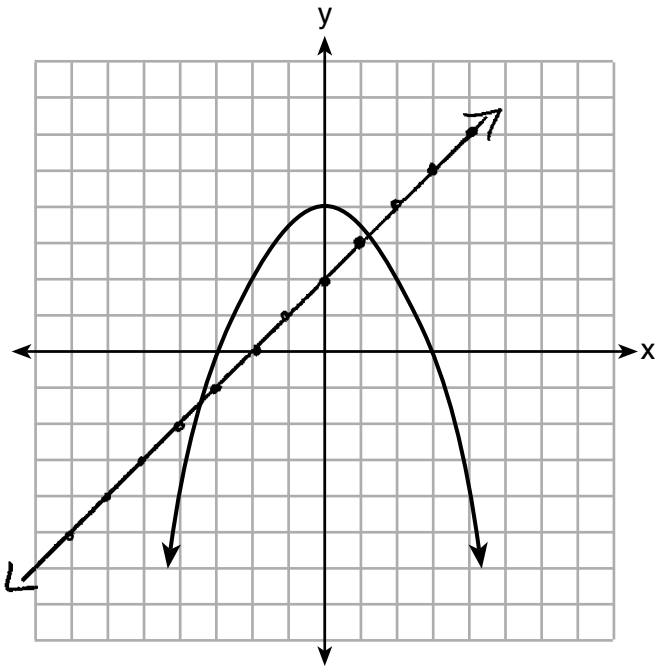




Score 1: The student made a shift to the right.

Question 28

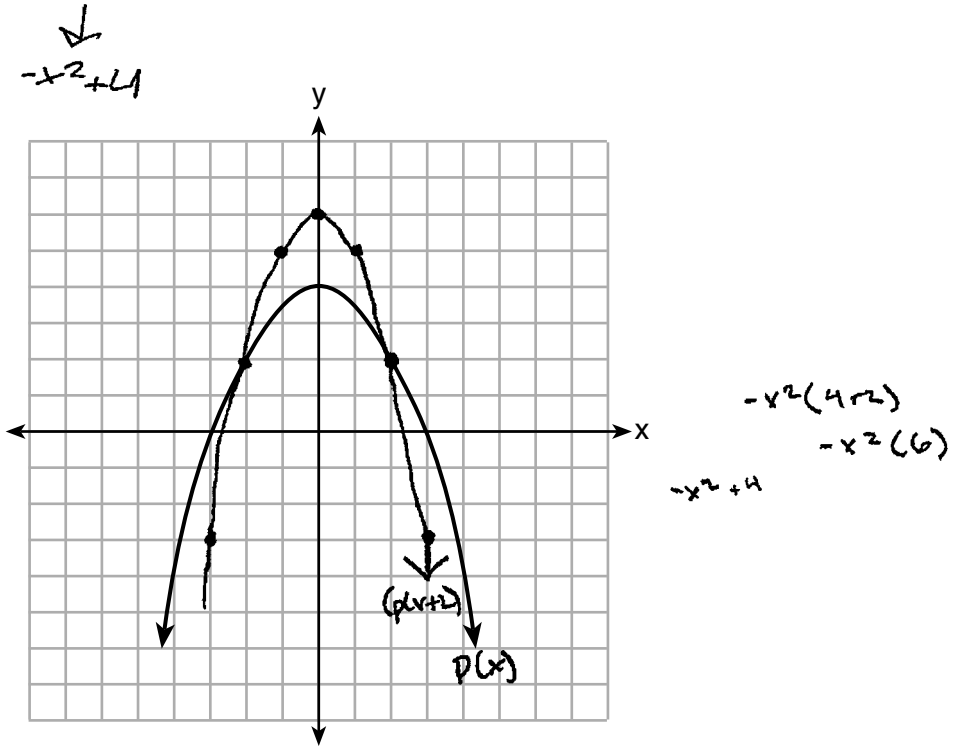
28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.



Score 0: The student graphed $y = x + 2$ instead of $p(x + 2)$.

Question 28

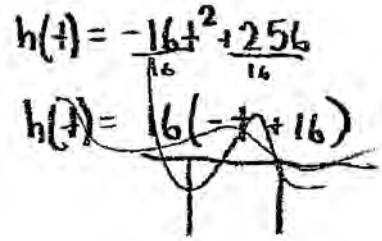
28 The graph of the function $p(x)$ is represented below. On the same set of axes, sketch the function $p(x + 2)$.

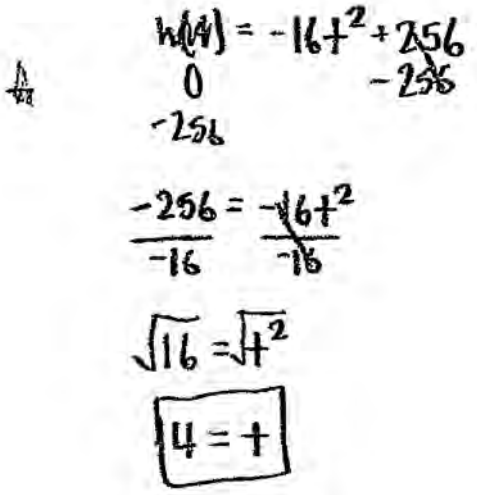


Score 0: The student shifted the vertex up 2, but did not shift all the points the same way.

Question 29

29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

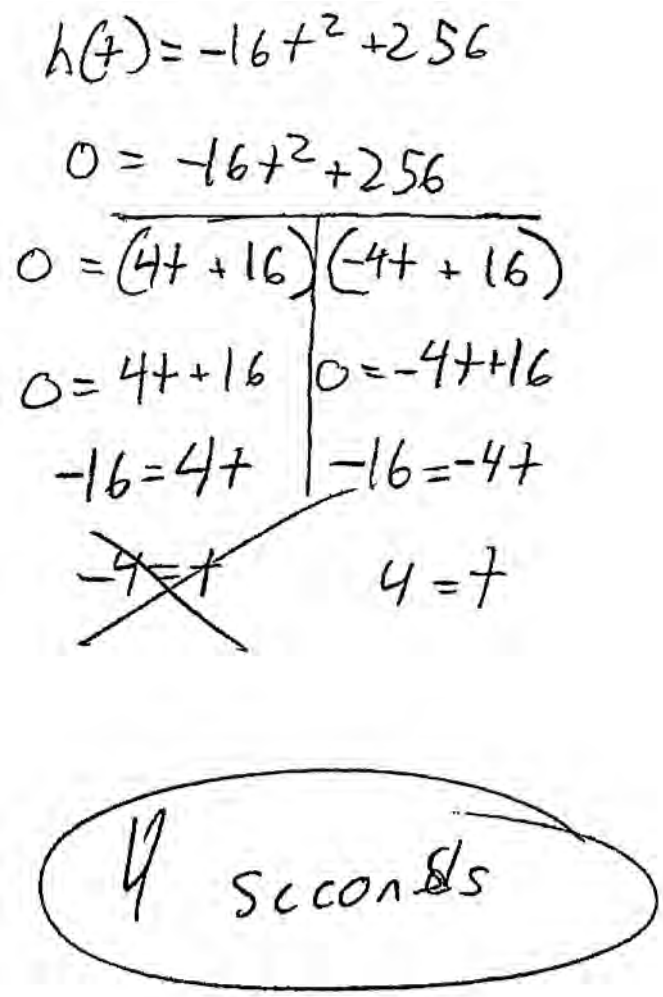




Score 2: The student gave a complete and correct response.

Question 29

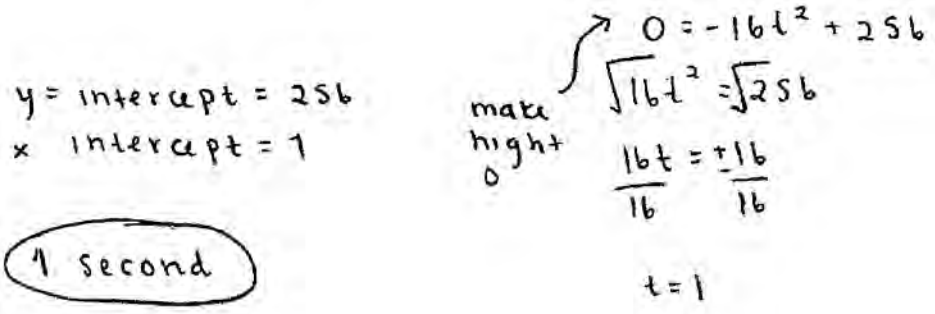
29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.



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

Question 29

29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.



Score 1: The student made an error in computing $\sqrt{16t^2}$.

Question 29

29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

$h(t) = -16t^2 + 256$

$0 = -16(t^2 - 16)$

$0 = t^2 - 16$

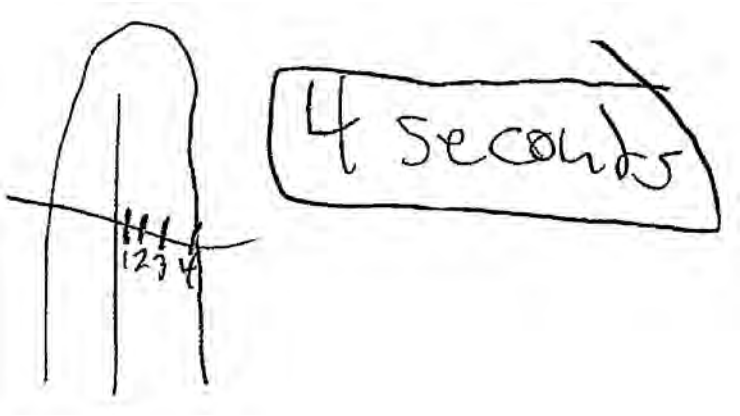
$16 = t^2$

$t = \pm 4$

Score 1: The student included -4 in their solution.

Question 29

29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.



Score 1: The student did not determine the answer algebraically.

Question 29

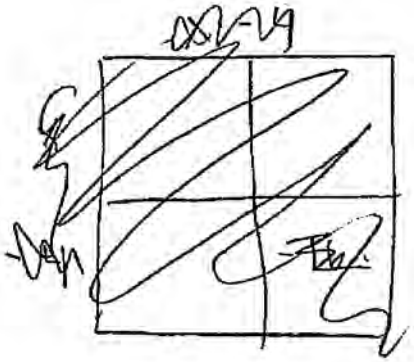
29 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

$h(t) = \frac{-16t^2}{-16} + \frac{256}{-16}$.

$h(t) = t^2 - 16$.

$t^2 - 16$.

it takes 16 seconds.

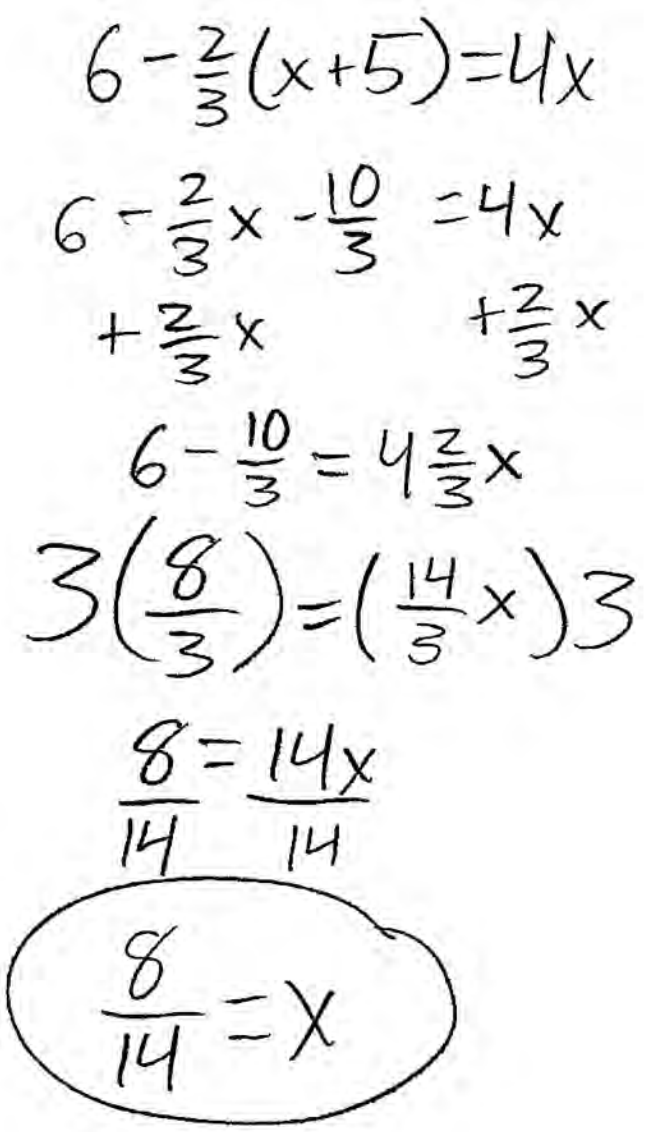


Score 0: The student did not show enough correct work to receive any credit.

Question 30

30 Solve the equation below algebraically for the exact value of x.

$$6 - \frac{2}{3}(x + 5) = 4x$$



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

Question 30

30 Solve the equation below algebraically for the exact value of x.

$$6 - \frac{2}{3}(x + 5) = 4x$$

$6 - \frac{2}{3}x - 3.\overline{3} = 4x$

$+\frac{2}{3}x \qquad +\frac{2}{3}x$

$2.\overline{6} = 4.\overline{6}x$

$\frac{2.\overline{6}}{4.\overline{6}} = \frac{4.\overline{6}x}{4.\overline{6}}$

$.57 = x$

Score 1: The student gave a rounded answer for x.

Question 30

30 Solve the equation below algebraically for the exact value of x.

$$6 - \frac{2}{3}(x + 5) = 4x$$

$6 - \frac{2}{3}(x+5) = 4x$

$6 - \frac{2}{3}x + \frac{10}{3} = 4x$

$\frac{28}{3} = 4\frac{2}{3}x$

$\frac{\frac{28}{3}}{\frac{10}{3}} = x$

$\frac{28}{10} = x$

Score 0: The student made more than one error.

Question 31

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

$(\sqrt{16})\frac{4}{7}$

$(4)\frac{4}{7} = \frac{16}{7} = 2.285714285714$

It is rational. This is because the product repeats 285714 forever, and an irrational number cannot repeat.

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

Question 31

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

R R

Rational. A rational times a rational is always rational.

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

Question 31

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

$\sqrt{16} \times \frac{4}{7} = 2.\overline{285714}$

Rational because it's a decimal that doesn't have a pattern

Score 1: The student stated a correct value for the product, but wrote an incorrect explanation.

Question 31

31 Is the product of $\sqrt{16}$ and $\frac{4}{7}$ rational or irrational? Explain your reasoning.

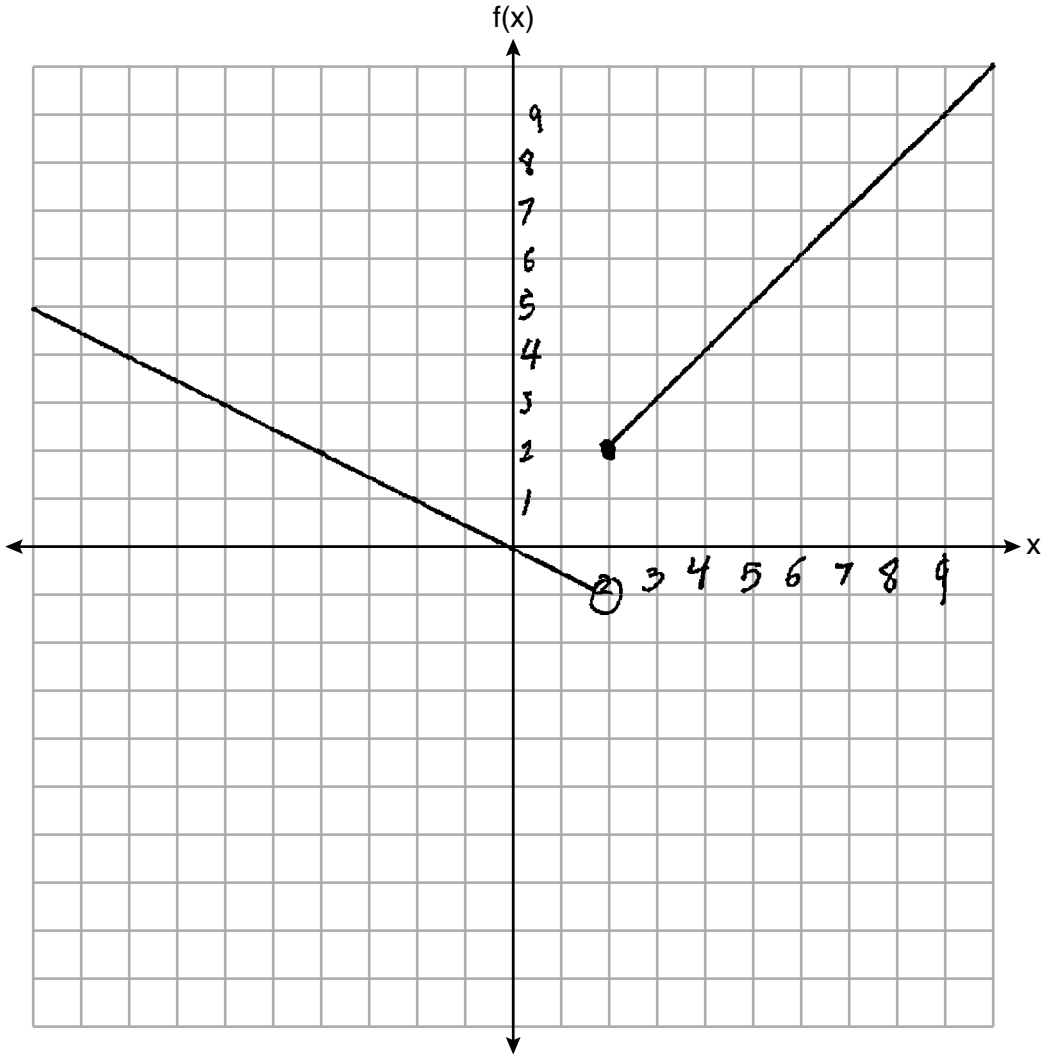
rational | it is a whole number

Score 0: The student gave a completely incorrect response.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$

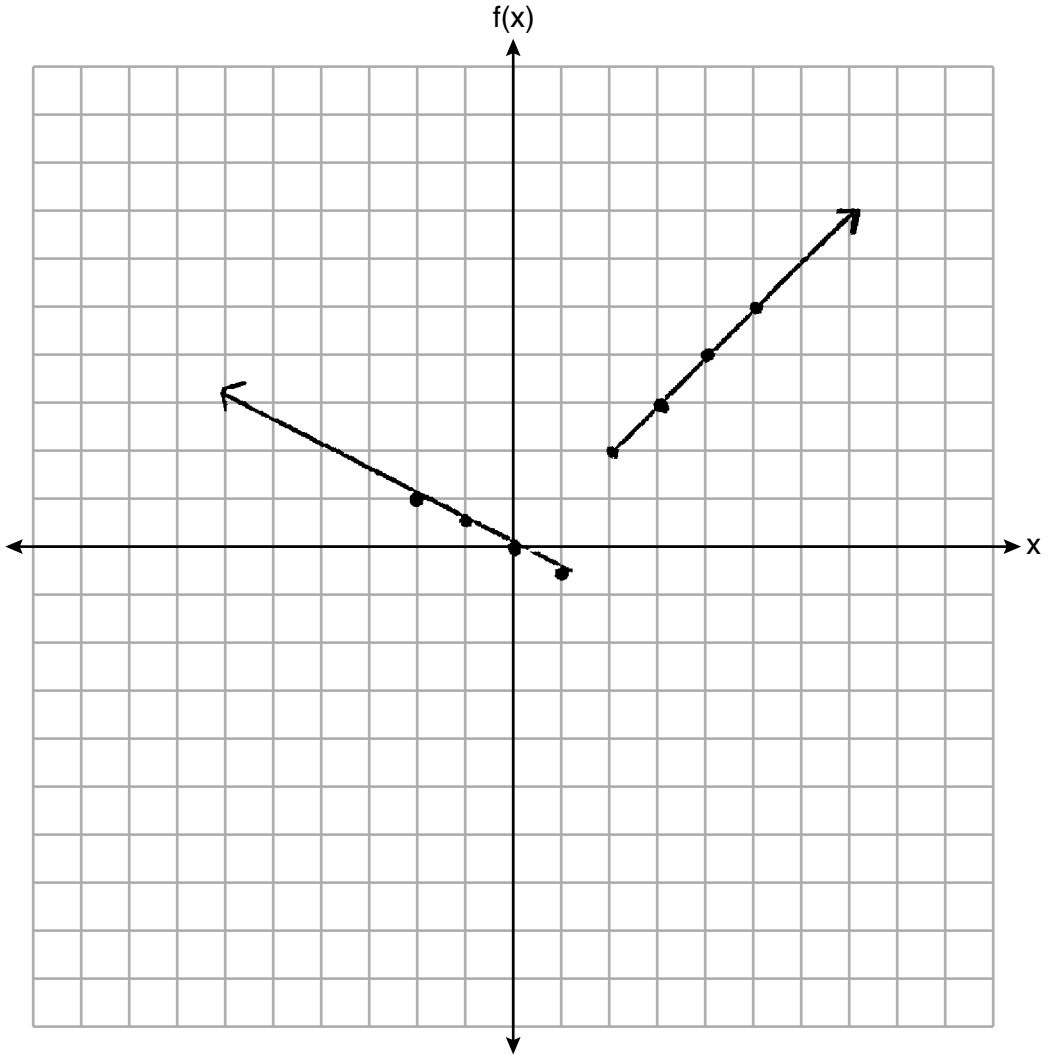


Score 2: The student gave a complete and correct response.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$

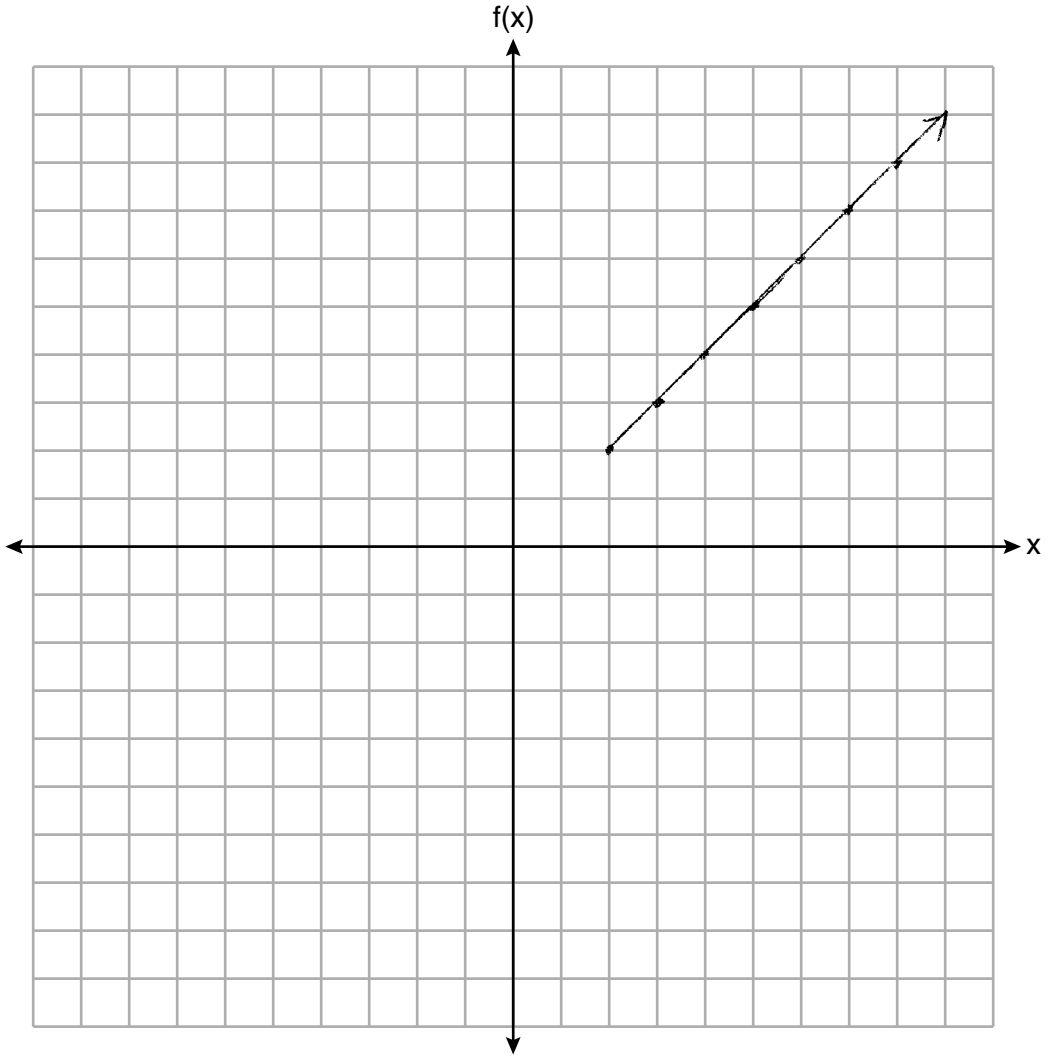


Score 1: The student graphed $f(x) = -\frac{1}{2}x$, $x \leq 1$.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$

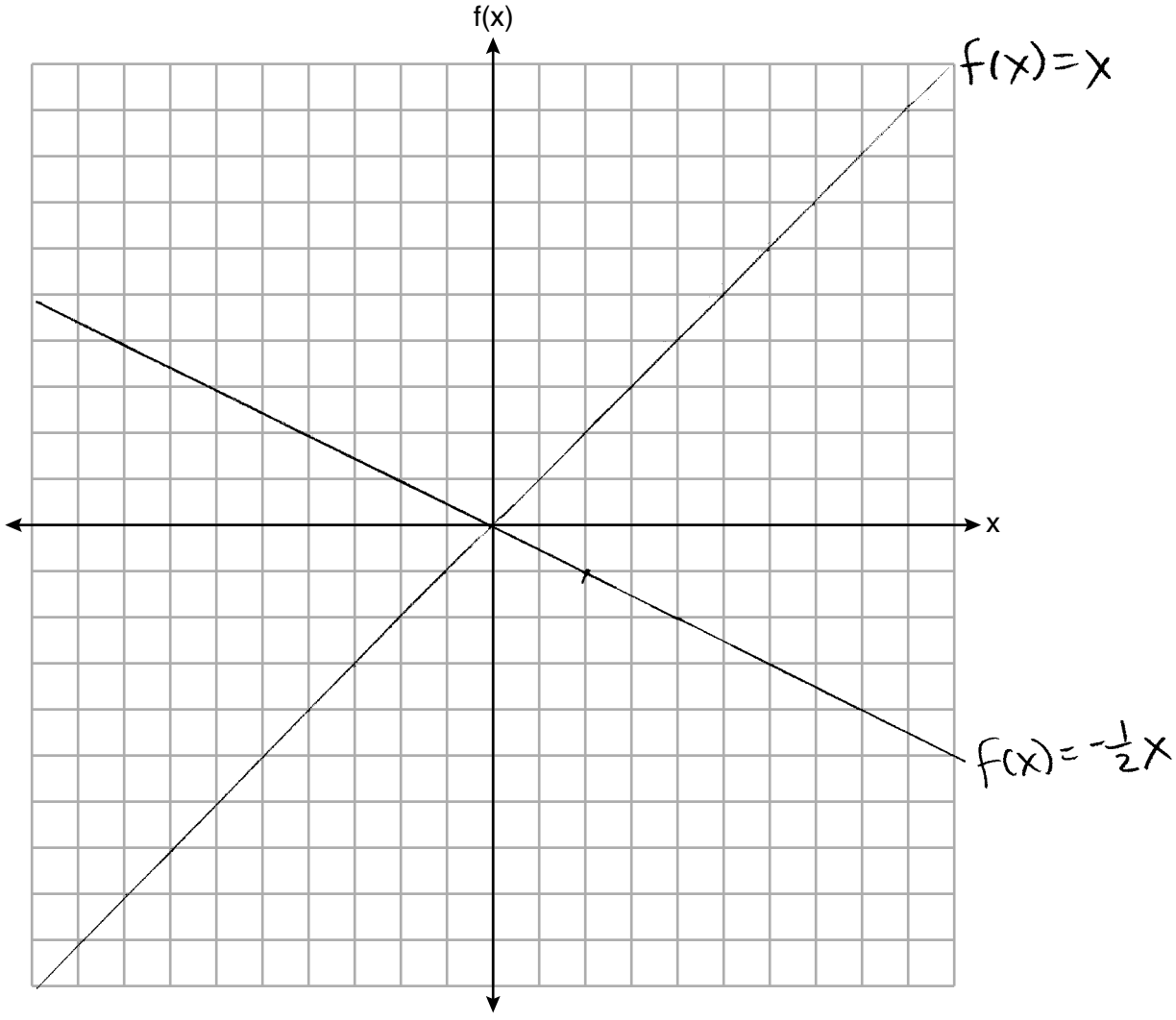


Score 1: The student graphed $f(x) = x, x \geq 2$ correctly.

Question 32

32 On the set of axes below, graph the piecewise function:

$$f(x) = \begin{cases} -\frac{1}{2}x, & x < 2 \\ x, & x \geq 2 \end{cases}$$



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

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 represents the starting number of rabbits in the lab.
1.014 represents one plus the percent growth of the rabbit population per day written as a decimal.

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

50
$p(x) = 20(1.014)^x$
$p(x) = 20(1.014)^{(50)}$
$p(x) = 40.08000\ldots$
$\approx$
$p(x) = 40.1$

100
$p(x) = 20(1.014)^x$
$p(x) = 20(1.014)^{(100)}$
$p(x) = 80.32033\ldots$
$\approx$
$p(x) = 80.3$

$$ROC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{80.3 - 40.1}{100 - 50} = 0.804$$
$\approx$

Rate of change is 0.8

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

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 is the initial number of rabbits and 1.014 is the changing factor which represents an increas of 1.4% in rabbit popuiation

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

$p(50) = 20(1.014)^{50} = 40.1$

$p(100) = 20(1.014)^{100} = 80.3$

(50, 40.1) (100, 80.3)

$\frac{y2-y1}{x2-x1} = \frac{80.3 - 40.1}{100 - 50} = \frac{40.2}{50} \rightarrow \boxed{0.8}$

Score 3: The student made an error in their explanation of 1.014 by not stating an increase of 1.4% per day.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 means that they started with 20 rabbits.
The "1.014" is the rate of bunny reproduction per day

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

$p(50) = 20(1.014)^{50}$
$p(50) = 40.048000302$

$p(100) = 20(1.014)^{100}$
$p(100) = 60.320333208$

$$\frac{60.320333208 - 40.048000302}{100 - 50} \quad \frac{40.240332906}{50}$$

$$= \frac{.804806\,5813}{1}$$

.8 bunnies per day

Score 3: The student wrote an incorrect explanation for 1.014.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

The 1.014 is really 1.4% if you move the decimal point and it represents the percentage. the 20 represents the starting number of rabbits.

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

$p(50) = 20(1.014)^{50}$

$p(50) = 40.1$

$p(100) = 20(1.014)^{100}$

$p(100) = 80.3$

$$\begin{array}{r} 80.3 \\ -\ 40.1 \\ \hline 40.2 \end{array}$$

40.2 is the average rate of change

Score 2: The student wrote an incomplete explanation for 1.014 and found the amount of change from day 50 to day 100, not the rate of change.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 represents how many rabbits the lab starts with

1.014 represents the rate of them

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

ROC = .2 $\frac{2}{2}$ $\frac{50}{100}$ =

$20(1.014)^{50} = 40.080000302$

$20(1.014)^{100} = 80.32033208$

$\frac{2.00400015}{2}$ 80.32033208 $\frac{2.0}{2}$

ROC = $\frac{\text{time}}{\text{distance}}$ $\frac{50}{40.}$ = $\frac{100}{80.32...}$ = $\frac{2}{}$

Score 1: The student wrote one correct explanation.

Question 33

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

20 = initial
1.014 = Percent

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

$20(1.014)^{50}$
40.08

$20(1.014)^{100}$
80.32

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

Question 34

34 There are two parking garages in Beacon Falls. Garage *A* charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage *B* charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage *A* and Garage *B*.

Garage A

$y = 3.00(x - 2) + 7.00$

Garage B

$y = 3.25x$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

$y = 3.00(x - 2) + 7.00$

$y = 3.25x$

$3.25x = 3.00(x - 2) + 7.00$

$3.25x = 3x - 6 + 7.00$

$3.25x = 3x + 1$

$-3.00x \quad -3x$

$.25x = 1$

$.25 \quad .25$

$1x = 4$

14 hours

check

$y = 3.00(4 - 2) + 7.00$

$y = 12 - 6 + 7.00$

$y = 6 + 7$

$y = 13$ ✓

$y = 3.25(4)$

$y = 13$ ✓

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

Question 34

34 There are two parking garages in Beacon Falls. Garage *A* charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage *B* charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage *A* and Garage *B*.

$B = 3.25X$

$A = 7 + 3(X-2)$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

$X = 4$

$3.25(4) = \$13$

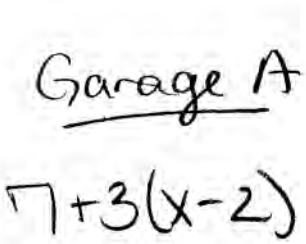
$7 + 3(4-2) = \$13$

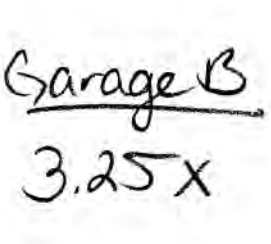
Score 3: The student did not determine the number of hours algebraically.

Question 34

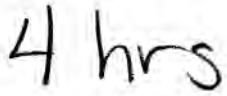
34 There are two parking garages in Beacon Falls. Garage *A* charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage *B* charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage *A* and Garage *B*.





Determine algebraically the number of hours when the cost of parking at both garages will be the same.



Score 2: The student wrote two expressions and did not determine the number of hours algebraically.

Question 34

34 There are two parking garages in Beacon Falls. Garage *A* charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage *B* charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage *A* and Garage *B*.

Garage A $C(x) = 3x + 7$

Garage B $C(x) = 3.25x$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

$C(x) = 3(28) + 7 = 91$

$C(x) = 3.25(28) = 91$

Score 1: The student wrote one correct equation.

Question 34

34 There are two parking garages in Beacon Falls. Garage *A* charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage *B* charges \$3.25 per hour to park.

When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage *A* and Garage *B*.

$3.25(7.00x) = c$

Determine algebraically the number of hours when the cost of parking at both garages will be the same.

Garage A →

X	1	2	3	4	5	6	7	8	9
Y	7.00	14.00	17	20	23	26	29	32	35

Garage B

X	1	2	3	4	5	6	7	8	9
Y	3.25	6.50	9.75	13.00	16.25	19.50	22.75	26	29.25

Garage A - 6 hours - \$26.00

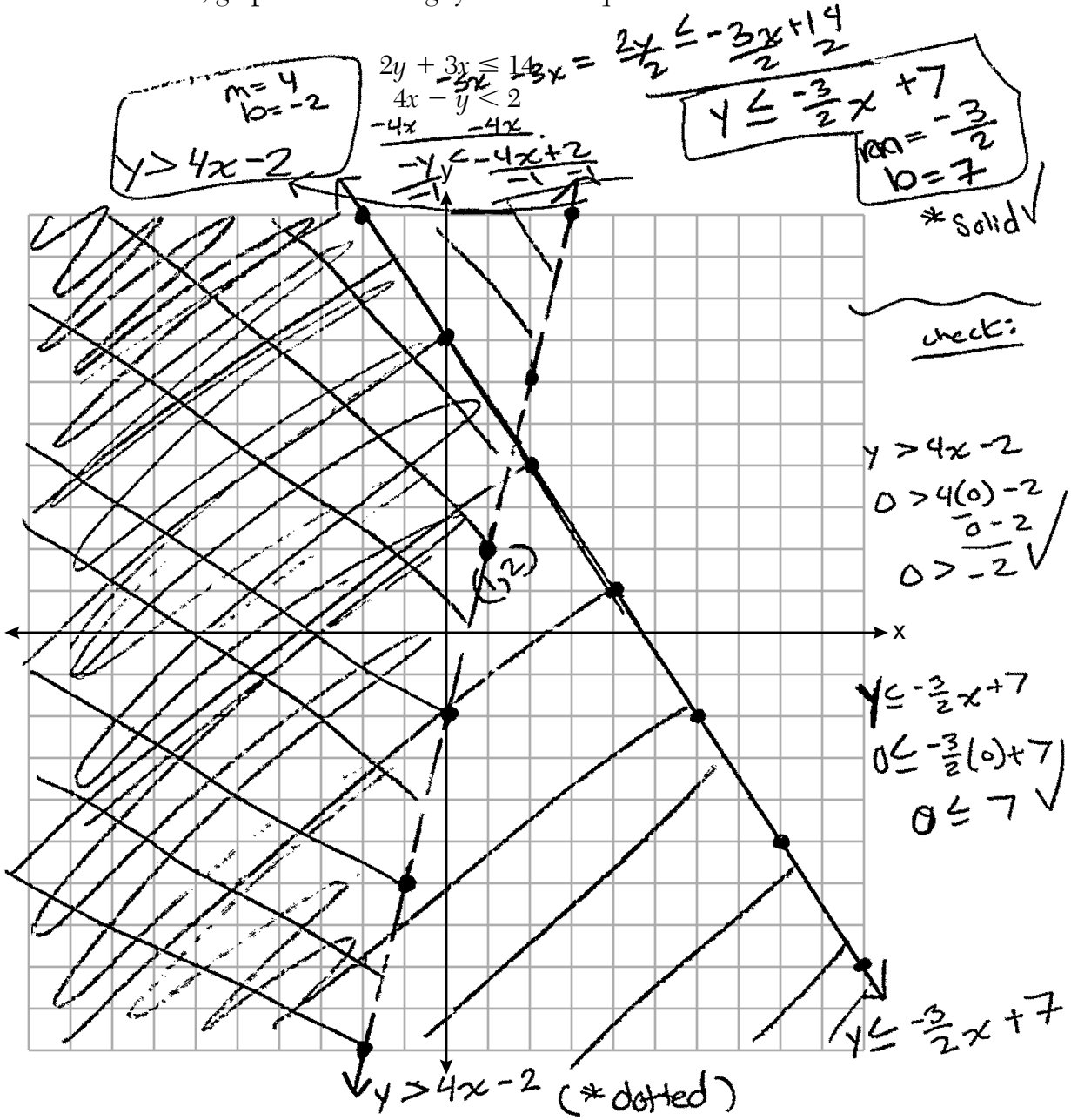
Garage B - 8 hours - \$26.00

Score 0: The student gave a completely incorrect response.

Question 35

35 On the set of axes below, graph the following system of inequalities:

$2y + 3x \leq 14$
$4x - y < 2$



Determine if the point (1,2) is in the solution set. Explain your answer.

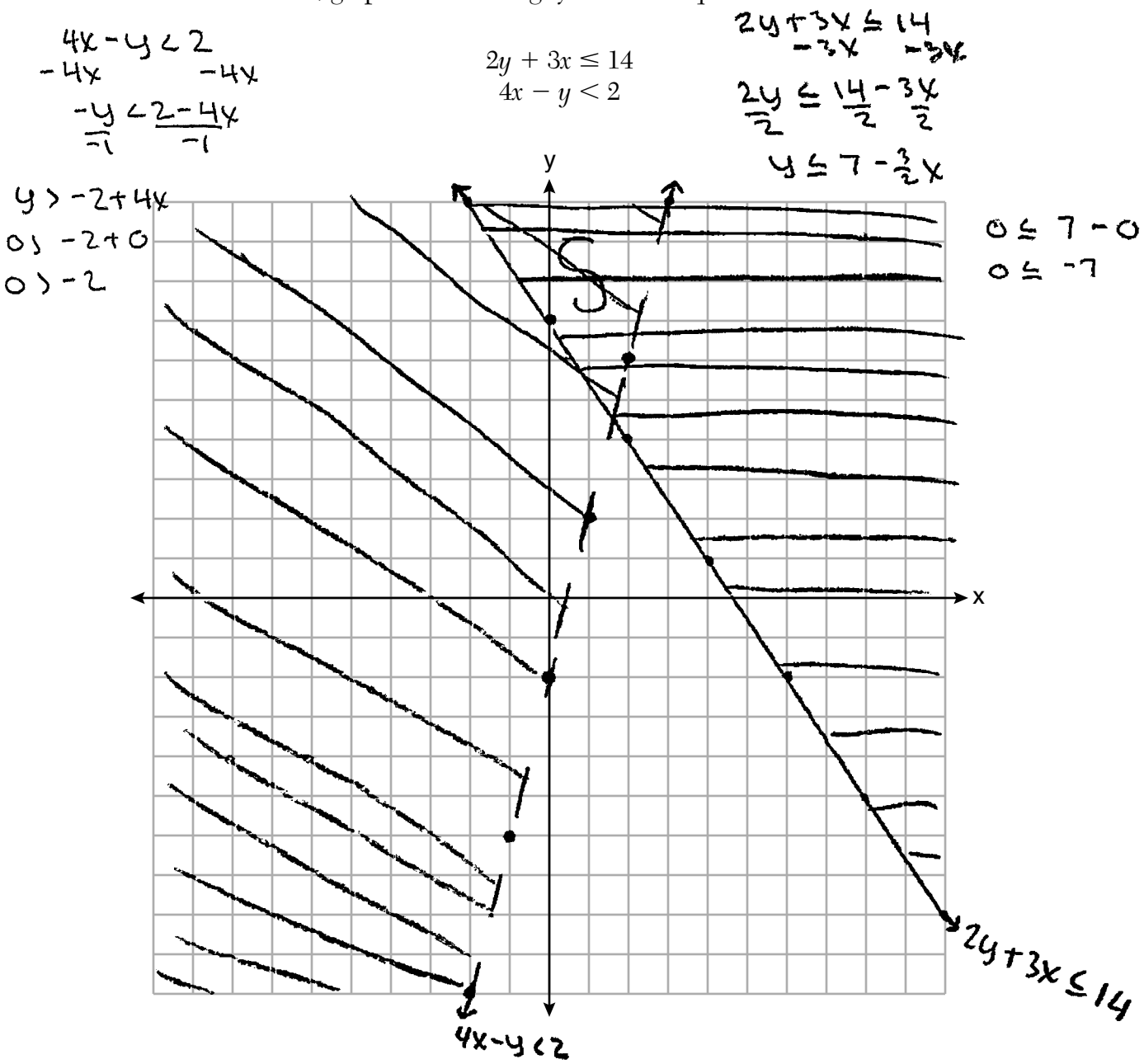
(1,2) is not in the solution set because it is on the dotted line, and therefor not a part of the solution.

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

Question 35

35 On the set of axes below, graph the following system of inequalities:

$2y + 3x \leq 14$
$4x - y < 2$



Determine if the point (1,2) is in the solution set. Explain your answer.

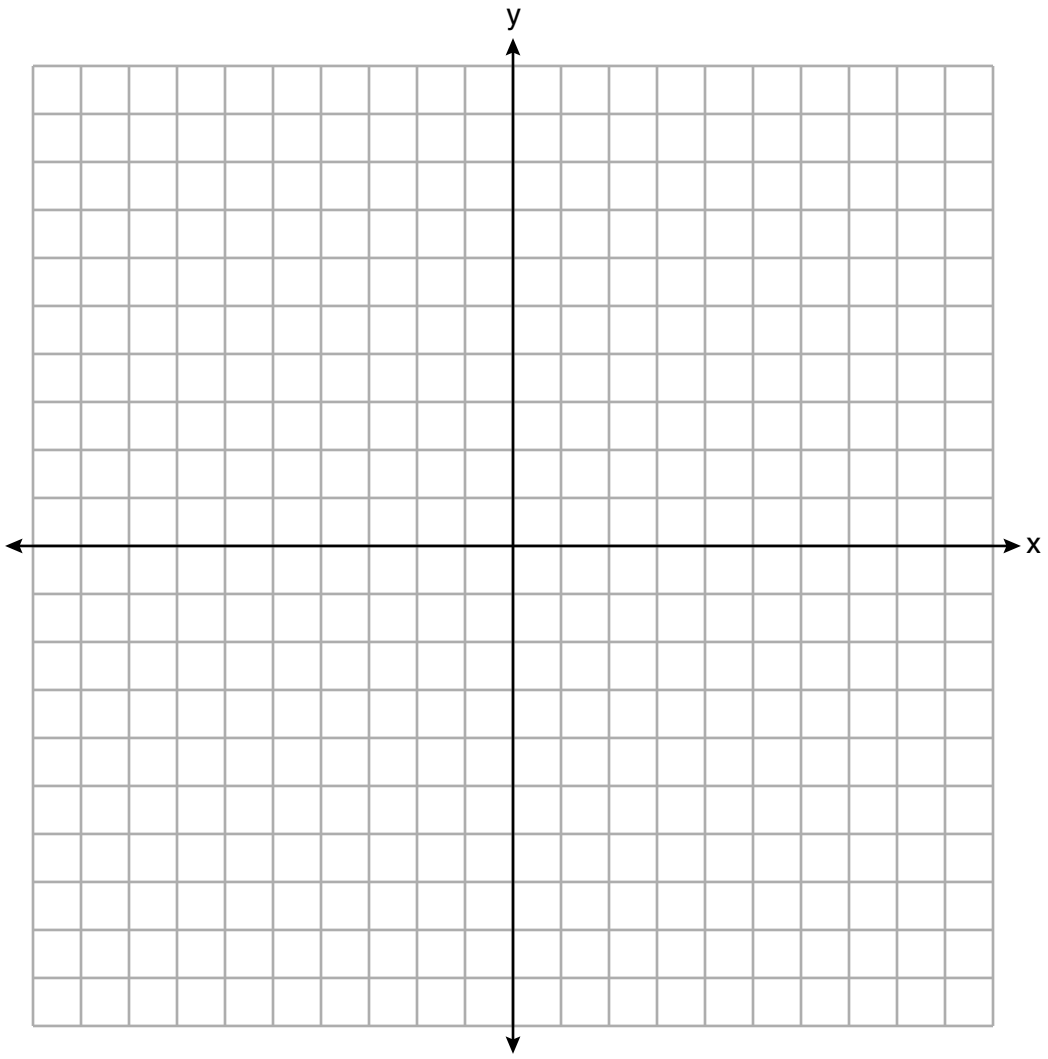
the point (1,2) is not a solution set because it does not fall into the shaded region of overlap between the 2 inequalities.

Score 3: The student shaded incorrectly for $2y + 3x \leq 14$, but wrote an appropriate explanation.

Question 35

35 On the set of axes below, graph the following system of inequalities:

$$2y + 3x \leq 14$$
$$4x - y < 2$$



Determine if the point (1,2) is in the solution set. Explain your answer.

$2y + 3x \leq 14$
$2 \cdot 2 + 3 \cdot 1 \leq 14$
$4 + 3 \leq 14$
$7 \leq 14$ ok

$4x - y < 2$
$4 \cdot 1 - 2 < 2$
$4 - 2 < 2$
$2 < 2$ no

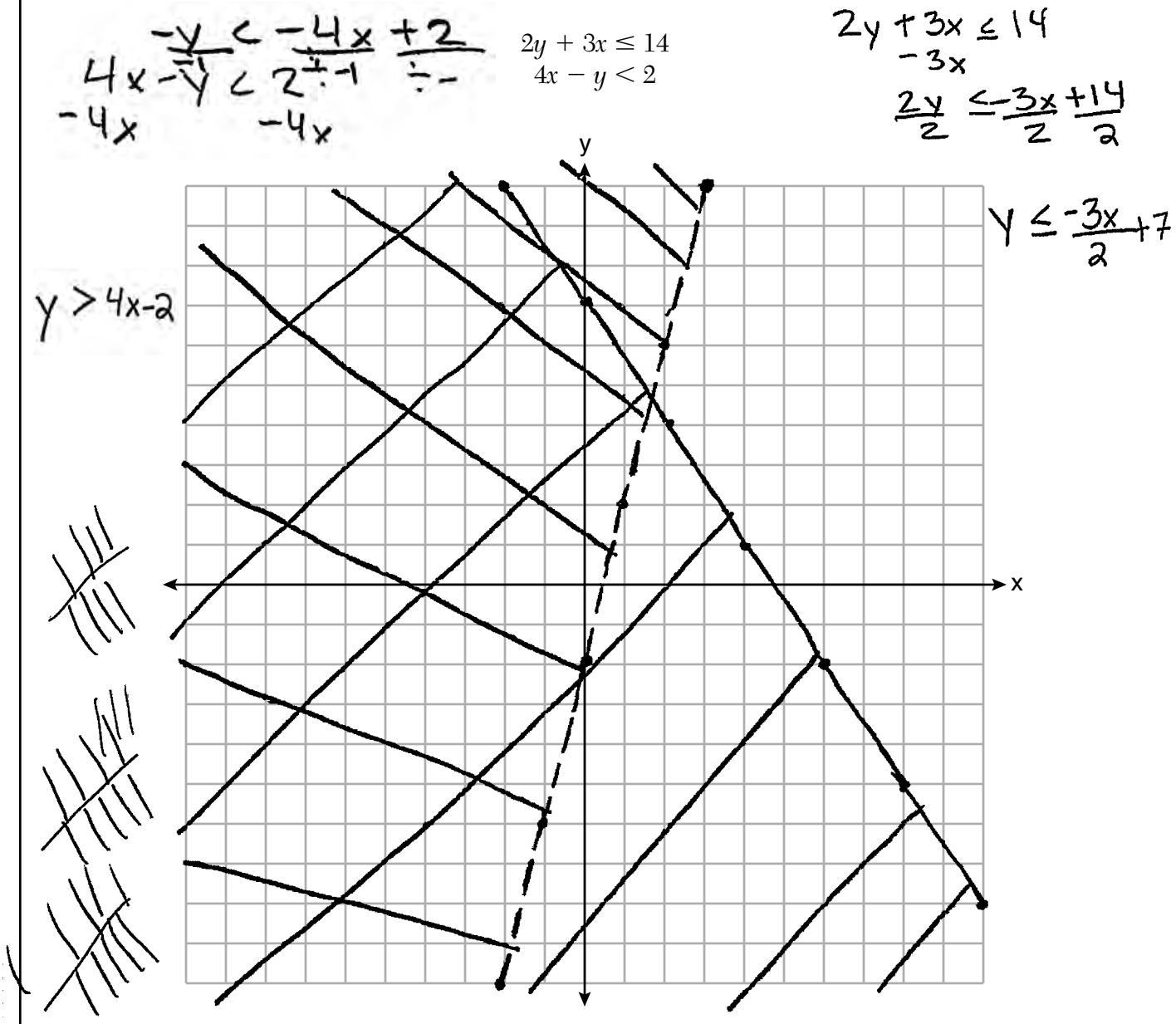
(1,2) does not work in both inequalities

Score 2: The student wrote an appropriate explanation.

Question 35

35 On the set of axes below, graph the following system of inequalities:

$2y + 3x \leq 14$
$4x - y < 2$



Determine if the point (1,2) is in the solution set. Explain your answer.

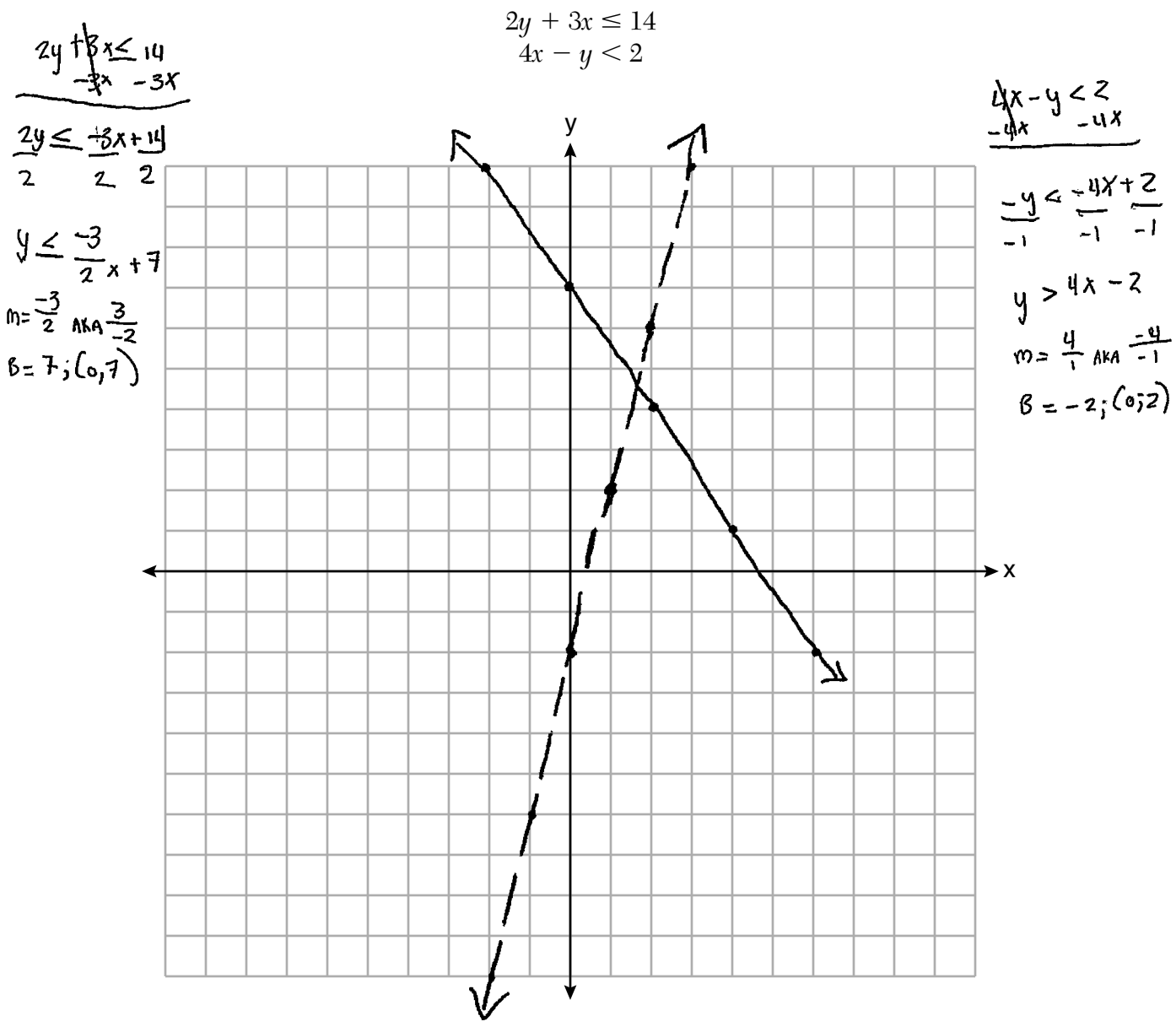
Point (1,2)

Score 1: The student graphed both inequalities appropriately, but neither is labeled, and the explanation is missing.

Question 35

35 On the set of axes below, graph the following system of inequalities:

$$2y + 3x \leq 14$$
$$4x - y < 2$$



Determine if the point (1,2) is in the solution set. Explain your answer.

Score 0: The student graphed both boundary lines correctly, but did not label either one.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	**English, y**
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

y=ax+b

y=.96x+23.95

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

r=.92

It shows that there is a strong positive correlation between the 85+ students. So as the percent of students who scored 85+ on math exams increases, so will the percent of students on English exams.

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

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	**English, y**
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

$y = 0.957704x + 23.9456$

$y = 0.96x + 23.95$

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

0.920496

0.92

since the correlation coefficient is so close to one, the correlation between these two variabes is very strong.

Score 3: The student did not write an explanation in context.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	**English, y**
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

$y = ax + b$
$a = .96$
$b = 23.95$

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

.92

Score 3: The student did not write an explanation.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	**English, y**
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

$y = .96x + 23.95$

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

The correlation coefficient of the linear regression is .96x because

Score 2: The student wrote a correct equation.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	**English, y**
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

.96x + 2.95

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

.92

how close the go to the line

strong

Score 2: The student wrote an expression and stated a correct correlation coefficient.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	**English, y**
27	46
12	28
13	45
10	34
30	56
45	67
20	42

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

.92

Score 1: The student stated a correct correlation coefficient.

Question 36

36 The percentage of students scoring 85 or better on a mathematics final exam and an English final exam during a recent school year for seven schools is shown in the table below.

Percentage of Students Scoring 85 or Better	
Mathematics, x	**English, y**
27 (1)	~~46~~ (1)
12 (2)	~~28~~ (2)
13 (3)	~~45~~ (3)
~~40~~ (4)	~~34~~ (4)
30 (5)	56 (5)
~~45~~ (6)	67 (6)
20 (7)	42 (7)

157

318

Write the linear regression equation for these data, rounding all values to the *nearest hundredth*.

total math scores: $\frac{157}{7} = 22.43$ | Total english scores: $\frac{318}{7} = 45.42$

$318 - 157 = 161$

(Equation: $y = 157x + 161$)

State the correlation coefficient of the linear regression equation, to the *nearest hundredth*. Explain the meaning of this value in the context of these data.

Correlation coefficient is 161 because 161 more people ~~got bet~~ got higher grades on the English test than the math. This could mean that people ~~do better on~~ are better at English rather than math.

Score 0: The student gave a completely incorrect response.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$d+q=90$

$.10d+.25q=17.55$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$.10d+.25q=17.55$

$10d+10q=90$

$-10d-25q=-1755$

$-1.5q=-85.5$

$-1.5 \quad -1.5$

$q=57$

$d+q=90$

$d+57=90$

$-57 \quad -57$

$d=33$

He has 57 quarters and 33 dimes

$.10d+.25q=17.55$

$.10(33)+.25(57)=17.55$

$3.3+14.25=17.55$

$17.55=17.55$ ✓

Question 37 is continued on the next page.

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

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.

33 dimes
33 · .25 = 8.25

57 quarters
57 · .25 = 14.25

14.25
+ 8.25
22.5

8% tax = $1.68

20.98
* .08
1.68

22.50
− 1.68
$20.82

Dylan will not have enough money, he will be 16¢ short.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

let x = number of quarters
let $90-x$ = number of dimes

$0.25x + 0.10(90-x) = 17.55$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$0.25x + 9 - 0.10x = 17.55$
$\quad -9 \quad\quad\quad\quad -9$

$\frac{0.15x}{0.15} = \frac{8.55}{0.15}$

$x = 57$

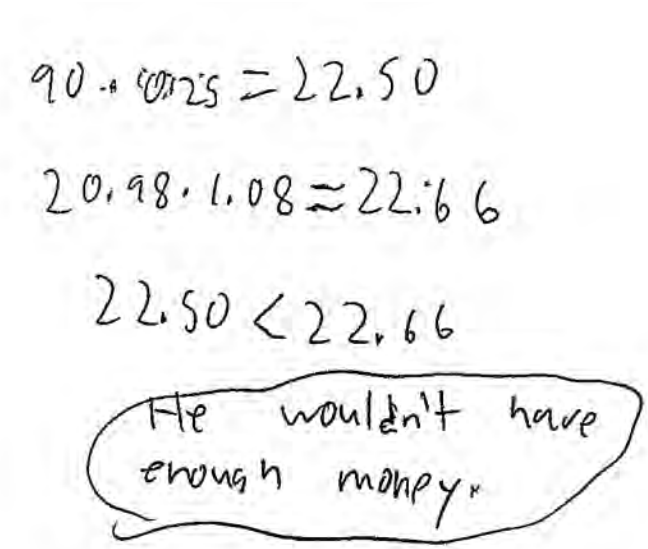
57 quarters

Question 37 is continued on the next page.

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

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.



Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

let n = number of dimes let y = number of quarters

$n + y = 90$

$0.10n + 0.25y = 17.55$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$n + y = 90$

$-n \quad -n$

$y = 90 - n$

$0.10n + 0.25(90 - n) = 17.55$

$0.10n + 22.5 - 0.25n = 17.55$

$\frac{-0.15n}{-0.15} = \frac{-4.95}{-0.15}$

$n = 33$

$33 + y = 90$

$-33 \quad -33$

$y = 57$

57 quarters

Question 37 is continued on the next page.

Score 5: The student calculated the tax on $22.50 instead of $20.98.

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.

$0.25(33)+0.25(57)=22.5$

$\frac{8}{100}=\frac{n}{22.5}$

$(8\times 22.5)=100n$

$\frac{180}{100}=\frac{100n}{100}$

$1.8=n$

$22.5-1.8=20.7$

$20.7<20.98$

No he will not be able to buy it

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

let d = number of dimes
let q = number of quarters

$d + q = 90$
$.10d + .25q = 17.55$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

Dylan has 57 quarters

$-.10(d + q) = (90.00) - .10$
$.10d + .25q = 17.55$
$-.10d - .10q = -9.00$
$0.15q = 8.55$
$\frac{0.15q}{0.15} = \frac{8.55}{0.15}$
$q = 57$

Question 37 is continued on the next page.

Score 4: The student showed appropriate work to find 57.

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$10d + 25q = 17.55$
$d + q = 90$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$d + q = \frac{90}{2} = 45$

There are 45 quarters in total.

Question 37 is continued on the next page.

Score 3: The student wrote one correct equation and a correct justification.

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.

$$\begin{array}{r} 20.98 \\ \times\ 1.08 \\ \hline 22.66 \end{array}$$

$10(0) + 25(90) = 2250$

Dylan won't be able to buy the video game

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

$\frac{q}{Q}$=quarters $\frac{d}{D}$=dimes

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$.25n + .10n = 90$ $= \$17.55$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$47 + 49 = 91$

57 quarters

* i couldn't figure this out, so trial and error on the calculator. *

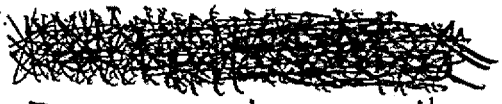
$52 + 38 = 90$ $60 + 30 = 90$ $58 + 32 = 98$ $57 + 33 = 90$

Question 37 is continued on the next page.

Score 2: The student wrote an incorrect equation and used a method other than algebraic to determine 57. The student also made an error calculating tax.

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.



8% tax = $1.70
+ Game = $20.98
TOTAL = $22.68

33 quarters = $8.25
+57 quarters = $14.25
90 quarters = $22.5

money = $22.50
game = $22.68

No, Dylan will not have enough money. He will only have $22.50. He cannot afford the $22.68 game. He is short $.18.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

10¢ 25¢

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

$17.55 = 10x + 25y$

$90 = x + y$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$17.55 = 10x + 25y$

$(10)\ 90 = x + y$

$17.55 = 10x + 25y$

$-900 = 10x + 10y$

$-882.45 = 15y$

$\frac{-882.45}{15} = \frac{15y}{15}$

$-58.83 = y$

he has 12 quarters

Question 37 is continued on the next page.

Score 1: The student wrote one correct equation.

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.

He wouldn't make enough money with the added tax.

Question 37

37 Dylan has a bank that sorts coins as they are dropped into it. A panel on the front displays the total number of coins inside as well as the total value of these coins. The panel shows 90 coins with a value of $17.55 inside of the bank.

If Dylan only collects dimes and quarters, write a system of equations in two variables or an equation in one variable that could be used to model this situation.

d=dimes
q=quarters

$90 = .10d + .25q$

Using your equation or system of equations, algebraically determine the number of quarters Dylan has in his bank.

$q = .10d + .25q$

Question 37 is continued on the next page.

Score 0: The student gave a completely incorrect response.

Question 37 continued

Dylan's mom told him that she would replace each one of his dimes with a quarter. If he uses all of his coins, determine if Dylan would then have enough money to buy a game priced at $20.98 if he must also pay an 8% sales tax. Justify your answer.

yes