

Math Assignment 2

aturcotte2

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1 Introduction

Page 110 question 1

A town's population has been growing linearly. In 2003, the population was 45,000, and the population has been growing by 1700 people each year. Write an equation, $P(t)$, for the population t years after 2003.

$$P(T) = 1700x + 45,000$$

Summary: To do this problem I just used 45000 as the y intercept because that is where it is starting and realized it is a linear graph so $Y=mx+b$ and the slope is 1700. I did not have much trouble with this type of problem.

Page 110 Question 3

Sonya is currently 10 miles from home, and is walking further away at 2 miles per hour. Write an equation for her distance from home t hours from now.

$$F(T) = 2x + 10$$

Summary: To do this problem i followed similar steps to the one before. I found that 10 would be the Y intercept on the linear graph and found the slope to be 2 so i plugged it all into $Y=MX+B$. I did not have much trouble with this problem.

Page 110 Question 7 Find if the following function is increasing or decreasing.

$$F(X) = 4X + 3$$

$$F(2) = 4(2) + 3$$

$$F(2) = 11$$

$$F(5) = 4(5) + 3$$

$$F(5) = 23$$

$$F(2) < F(5)$$

The function is increasing because $F(2)$ is less than $F(5)$. Summary: This problem was not difficult after learning what it meant by increasing and decreasing. When a function is increasing it will have X_1 be greater than X_2 . and by plugging in 2 and 5 as X i found it to be increasing.

Page 110 Question 12 For the following function, find if it is increasing or decreasing.

$$K(X) = -4X + 1$$

$$K(2) = -4(2) + 1$$

$$K(2) = -7$$

$$K(5) = -4(5) + 1$$

$$K(5) = -21$$

$$K(2) > K(5)$$

This function is decreasing because $K(2)$ is greater than $K(5)$.

Summary: To start the problem I plugged 2 into the function and got -7, then I plugged 5 in and got -21. After I compared the two numbers and since X_1 was greater then X_2 I found the graph to be decreasing.

page 110 Question 18 Find the slope that goes through the following points. (1,5) and (4,11)

$$M = Y_2 - Y_1 / X_2 - X_1$$

$$M = 11 - 5 / 4 - 1$$

$$M = 6 / 2$$

$$M = 3$$

Summary: For this problem I remembered the formula for slope when given 2 points is $M = Y_2 - Y_1 / X_2 - X_1$. So after plugging all the in i got $6/2$ which reduces down to a slope of 3.

Page 111 Question 25 Sonya is walking home from a friend's house. After 2 minutes she is 1.4 miles from home. Twelve minutes after leaving, she is 0.9 miles from home. What is her rate?

At T1 she is 1.4 miles away
At T2 she is 0.9 miles away
the difference between T1 and T2 is 10 minutes.

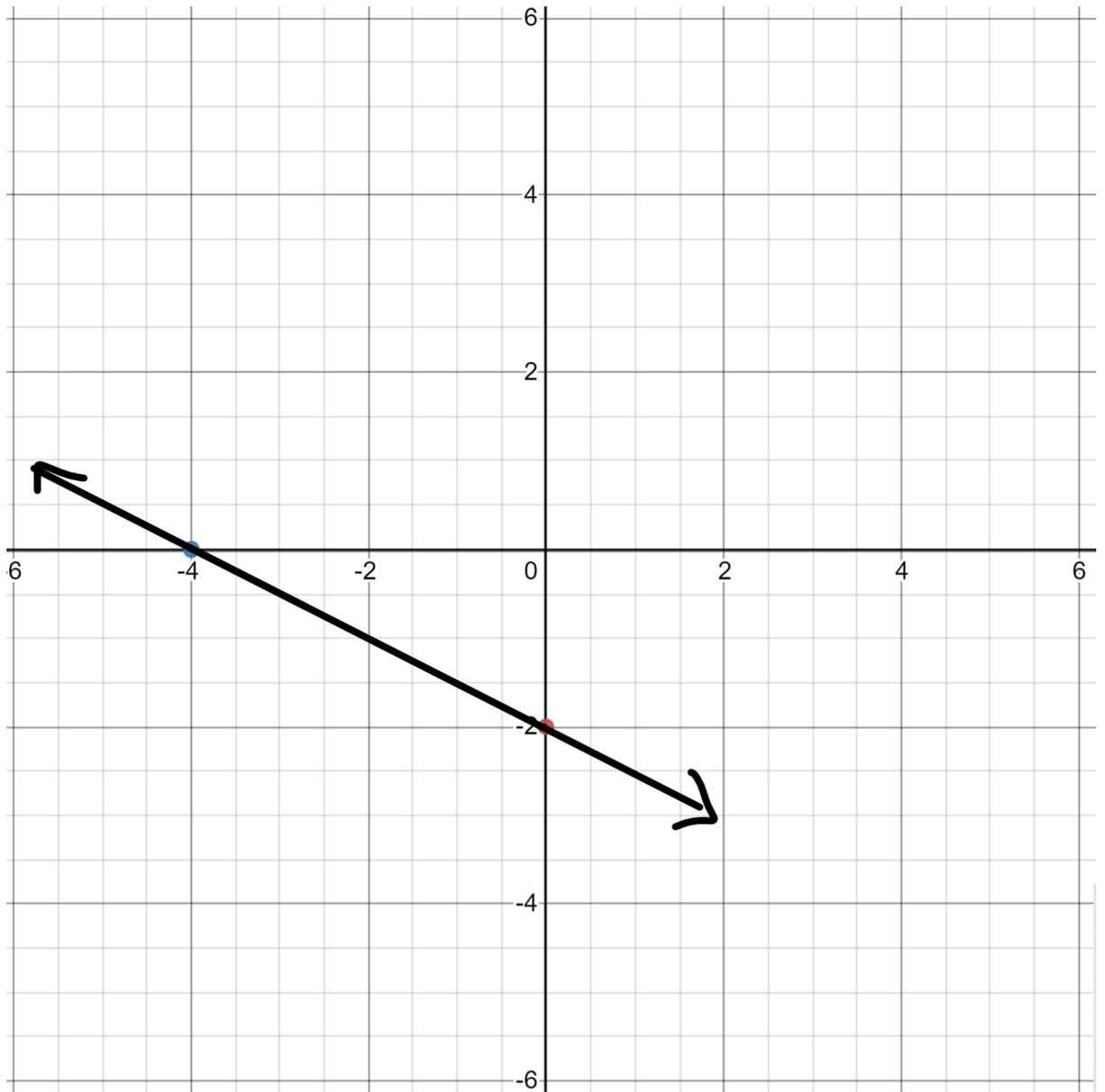
$$R = D/t.$$

$$R = 0.5/10$$

$$R = 0.05MPH$$

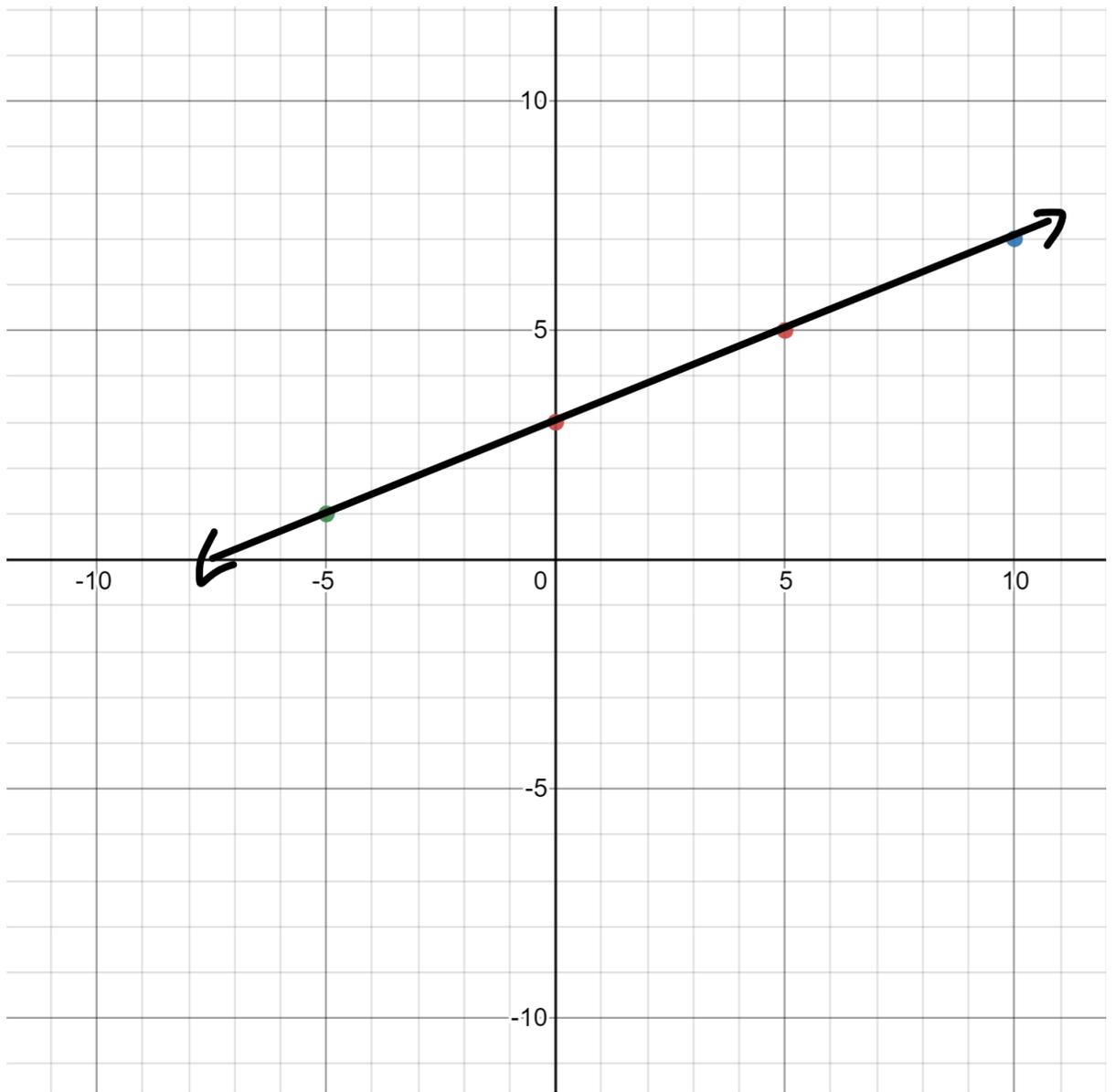
Summary: I remembered from a physics class that the formula for rate is $R=D/T$. So I found T because in 2 minutes she was 1.4 miles away and after twelve minutes she was 0.9 miles away so that gave her a T of 10 minutes. I found D because in those 10 minutes she walked from 1.4 miles to 0.9 miles which gave her a total distance traveled of 0.5 miles. I plugged it into the equation and got 0.05 mph.

Page 125 Question 7 sketch a line with the given features. An X-intercept of (-4,0) and a Y-intercept of (0,-2)



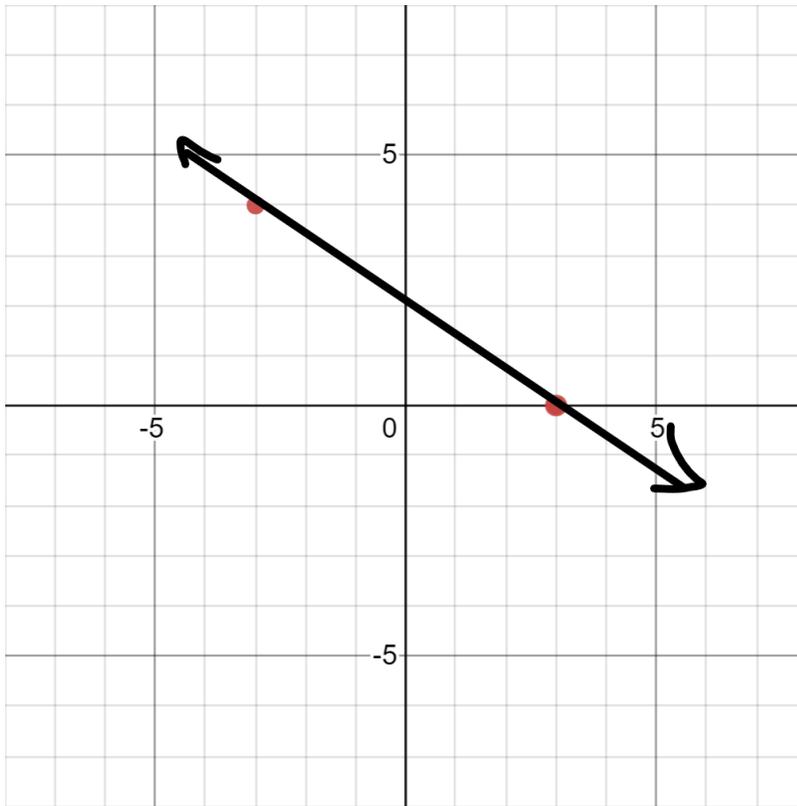
Summary: This problem was pretty easy, I just had to find a place that would let me graph it and make it work but after that it was an easy problem.

Page 125 Question 10 Sketch a line with the given features
A vertical intercept of $(0,3)$ and a slope of $2/5$



Summary: After getting the hang of the technology, this was a very simple problem.

Page 125 Question 12 Sketch a line that passes through the points $(-3,4)$ and $(3,0)$



Summary: I found this problem to be easy because you just graph the points and draw a straight line to connect them so I did not have any trouble with them.

Page 126 question 23 If $g(x)$ is the transformation of $f(x) = x$ after a vertical compression by $3/4$, a shift left by 2, and a shift down by 4 a. Write an equation for $g(x)$ b. What is the slope of this line? c. Find the vertical intercept of this line.

(A)

$$g(x) = (3/4)(x + 4) - 2$$

(B) The slope of the line is $3/4$ (C) The vertical intercept is 1

Summary: I found this problem to be easy I just wrote the equation and plugged in zero to find the y intercept.

Page 126 question 30 Find the X and Y intercepts for the equation.

$$G(X) = 2x + 4$$

The Y intercept is 4. We know this because if we replace X with zero, you are left with just 4.

$$0 = 2X + 4$$

$$-4 = 2X$$

$$X = -2$$

The X intercept is -2. We know this because if we replace the Y value for 0 and solve the equation for X, you are left with -2.

Summary: I found this to be easy as it was just replacing variable with zero and solving.

Page 127 Question 35 Determine if the 2 lines are parallel, perpendicular, or neither. Line 1: Passes through (0,6) and (3,-24) Line 2: passes through (-1,19) and (8,-71)

$$M1 = -24 - 6/3 - 0$$

$$M1 = -10$$

$$M2 = -71 - 19/8 - -1$$

$$M2 = -90/9$$

$$M2 = -10$$

These two lines are parallel to each other because they have the same slope but different y intercepts.

Summary: To solve this problem I found the slopes of each line to see if they were the same or opposite each other. I knew if they were the same slope that they would have to be parallel and if they were opposite slopes they would be perpendicular to each other.

Page 127 Question 41 Write an equation for the line that is parallel to $F(X) = -5X - 3$ and passes through (2,-12)

$$F(X) = -5x - 2$$

Summary: To solve this problem I knew that the slope had to stay the same. Then i saw that the original passed through (2,-13) so i knew that to get the parallel line to pass through (2,-12) all I had to do was shift it up one unit from the original.

Page 137 Question 1 In 2004, a school population was 1001. By 2008 the population had grown to 1697. Assume the population is changing linearly.

(A) How much did the population grow from 2004 to 2008.

$$1697 - 1001 = 696$$

It went up by 696 people.

(B) How long did it take the population to grow from 1001 students to 1697 students?

$$2008 - 2004 = 4$$

It took 4 years to grow 696 people

(C) What is the average population growth per year?

$$696/4 = 174$$

the population increases 174 people per year.

(C) What was the population in the year 2000?

$$174 * 4 = 696$$

$$1001 - 696 = 305$$

there were 305 kids in the school in 2000

(E) Find an equation for the population, P , of the school t years after 2000.

$$P = 174(T - 2000) + 305$$

(F) Using your equation, predict the population of the school in 2011.

$$P = 174(2011 - 2000) + 305$$

$$P = 174(11) + 305$$

$$P = 1914 + 305$$

$$P = 2219$$

The population in 2011 will be 2219.

Summary: This problem was just time consuming because it had so many parts but it was not too difficult.

Page 138 Question 10 You are choosing between two different window washing companies. The first charges 5 dollars per window. The second charges a base fee of 40 dollars plus 3 dollars per window. How many windows would you need to have for the second company to be preferable?

$$A = 5x$$

$$B = 3x + 40$$

Anything over 20 windows will make company 2 cheaper than Company 1.

Summary: This problem was not too difficult. I just graphed both lines and found where they intersect and saw that would be where the prices are the same.

Page 139 Question 13 Find the area of a triangle bounded by the y axis, the line, $f(X)=9-6/7x$. And the line that is perpendicular to $F(X)$ that passes through the origin.

$$A = 1/2BH$$

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

Distance for line 1

$$\text{SQRT}((-63 - 0)^2 + (63 - 9)^2)$$

$$\text{SQRT}((3969) + (2916))$$

$$\text{SQRT}(6885)$$

$$D = 83$$

Distance for line 2

$$\text{SQRT}((-63 - 0)^2 + (-63 - 0)^2)$$

$$\text{SQRT}((3969) + (3969))$$

$$\text{SQRT}(7938)$$

$$D = 89$$

$$A = 0.5(9)(83)$$

$$A = 373.5$$

Summary: For this problem I found the point the two lines intersected at and used those points for the line distance formula. I used the other points from their Y intercepts. After I did this I plugged the number into the Area formula and

got my answer. I did not have a ton of trouble with this problem but it was slightly tricky.

Page 139 Question 16 Find the area of a parallelogram bounded by the x axis, the line $g(x)=2$, the line $f(x)=3x$, and the line parallel to $f(X)$ passing through $(6, 1)$.

$$A = 0.5bh$$

$$A = 0.5(1)(2)$$

$$A = 1$$

Triangle 1 has an area of 1

$$A = 0.5BH$$

$$A = 0.5(2)(2)$$

$$A = 2$$

Triangle 2 has an area of 2.

$$A = LW$$

$$A = (2)(4.5)$$

$$A = 9$$

Area of the main rectangle is 9

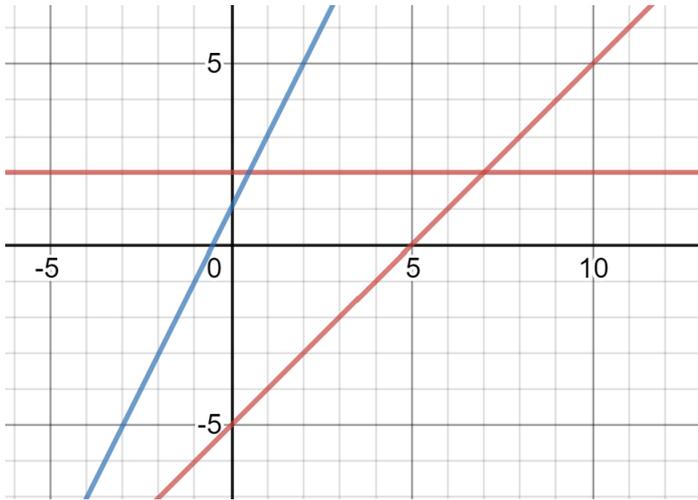
$$A = T1 + T2 + R1$$

$$A = 1 + 2 + 9$$

$$A = 12$$

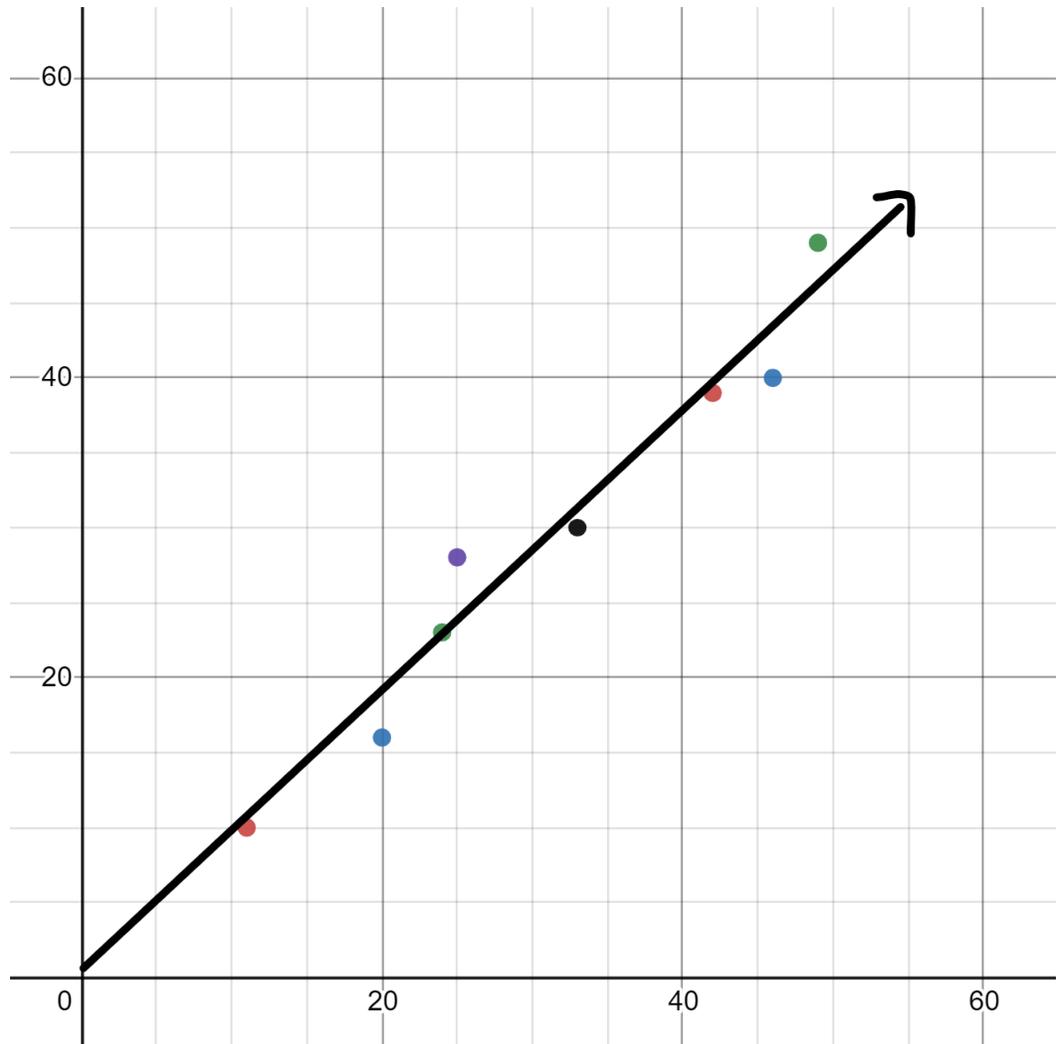
The area of the whole shape is 12 units.

Summary:To do this problem I graphed all the lines so that i could see the shape. I saw that it was a rectangle with two different triangles at the ends. I solved for the area of each triangle and then found the are of the main rectangle. I added them all together to find that the area was 12. This problem took some thinking and was a little bit difficult, but once I figured out how I wanted to solve it it was not bad. The hard part was just figuring out where and how to start. The graph I used is below.



Page 147 Question 1 The following is data for the first and second quiz scores for 8 students in a class. plot the points and sketch a line that fits the data.

First Quiz	11	20	24	25	33	42	46	49
Second Quiz	10	16	23	28	30	39	40	49



Summary: I did not find this too difficult I just had to graph points and sketch a line.

Page 147 Question 6 Based on each set of data given, calculate the regression line using your calculator or other technology tool, and determine the correlation coefficient.

x	y
4	44.8
5	43.1
6	38.8
7	39
8	38
9	32.7
10	30.1
11	29.3
12	27
13	25.8
14	24.7
15	22
16	20.1
17	19.8
18	16.8

For the Correlation Coefficient I got -2.

Summary: I solved this by plugging in the points into Desmos and used a calculator in there to find the Correlation Coefficient. I did some research to find out what that was because a few of the terms I have not heard before, but after that the problem was easy.

Page 148 Question 7 A regression was run to determine if there is a relationship between hours of TV watched per day (x) and number of sit-ups a person can do (y). The results of the regression are given below. Use this to predict the number of sit-ups a person who watches 11 hours of TV can do. $y=ax+b$
 $a=-1.341$ $b=32.234$ $r^2=0.803$ $r=-0.896$

$$Y = (-1.341)(11) + 32.234$$

$$Y = 17.48$$

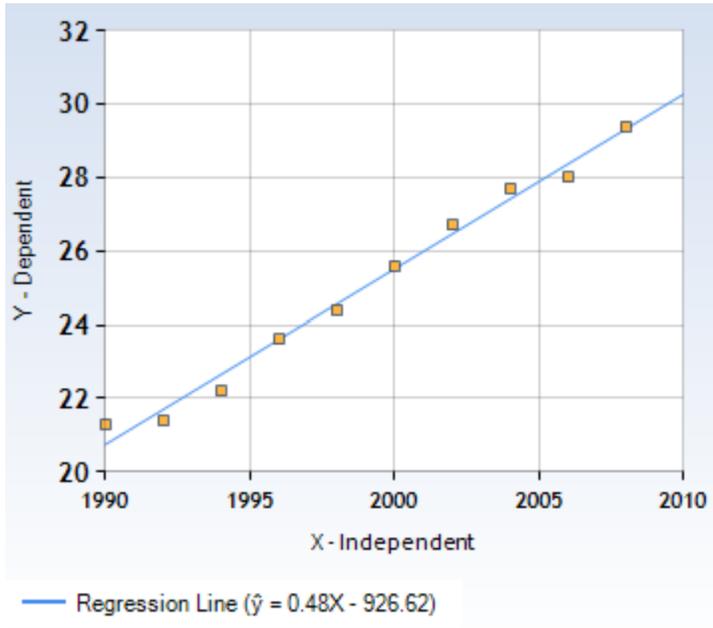
A person who watches 11 hour of TV per day can do 17.48 sit ups

Summary: Honestly I did not know exactly what to do, so I started plugging numbers into the equations with the numbers and equation that the question provided. I solved and got 17.48 and when I checked in the Solution manual it was correct. So I am not sure if I struggled or not but I did get the answer right.

Page 148 Question 13

The US census tracks the percentage of persons 25 years or older who are college graduates. That data for several years is given below. Determine if the trend appears linear. If so and the trend continues, in what year will the percentage exceed 35 percent?

Year	1990	1992	1994	1996	1998	2000	2002	2004	2006	2008
Percent Graduates	21.3	21.4	22.2	23.6	24.4	25.6	26.7	27.7	28	29.4

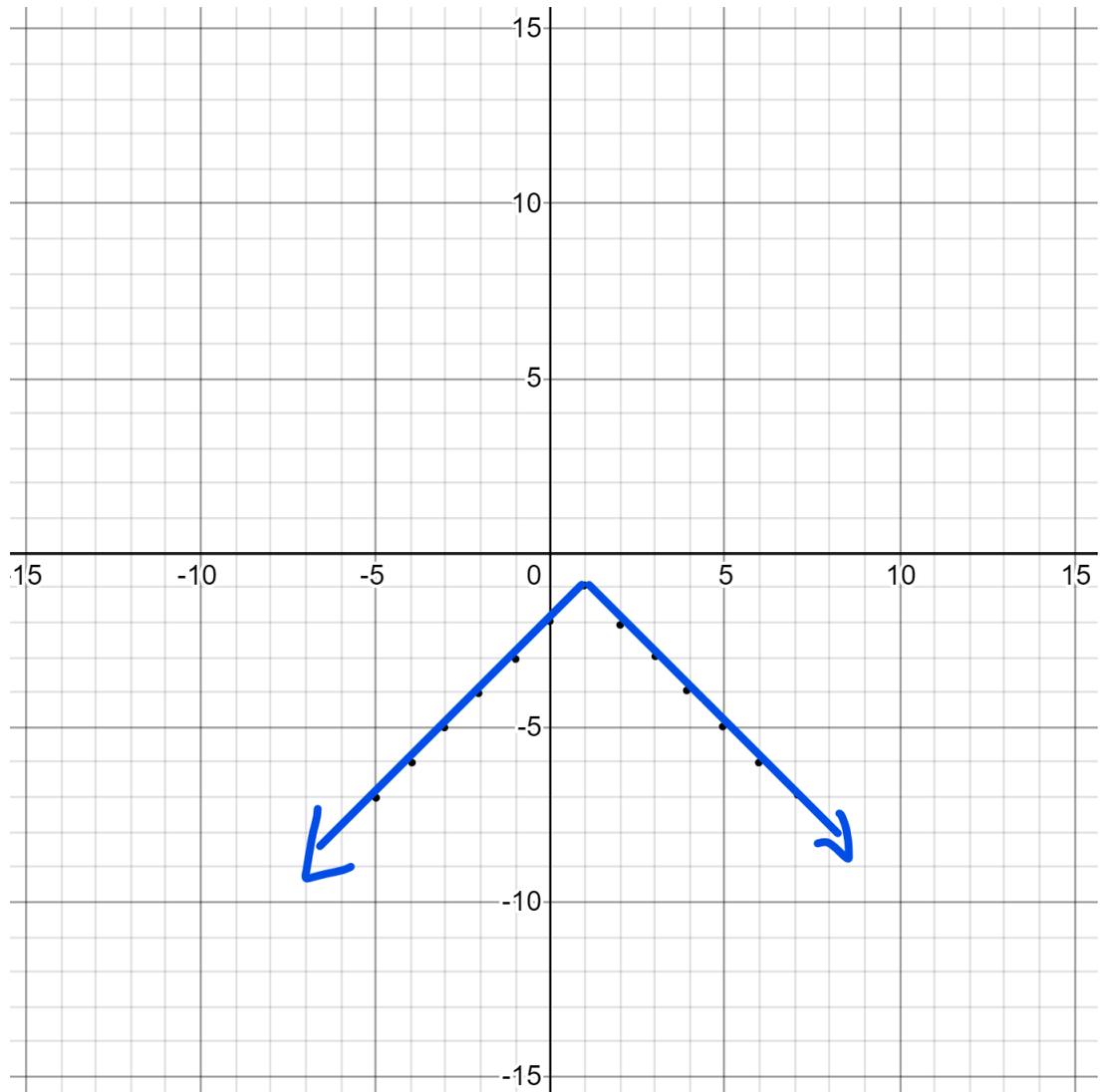


According to the graph the year the percentage will exceed 35 percent is 2020.

Summary: With this problem I plugged all the points into Desmos and they showed me that the line of regression has a slope of 0.5, with this i plugged it into the equation of the line and found that the year would be 2020. I did not have too much trouble but it was tricky thinking about how i wanted to start it. After I graphed all the points it became easy to figure out after that.

Page 156 Question 5 Sketch a graph for the function below

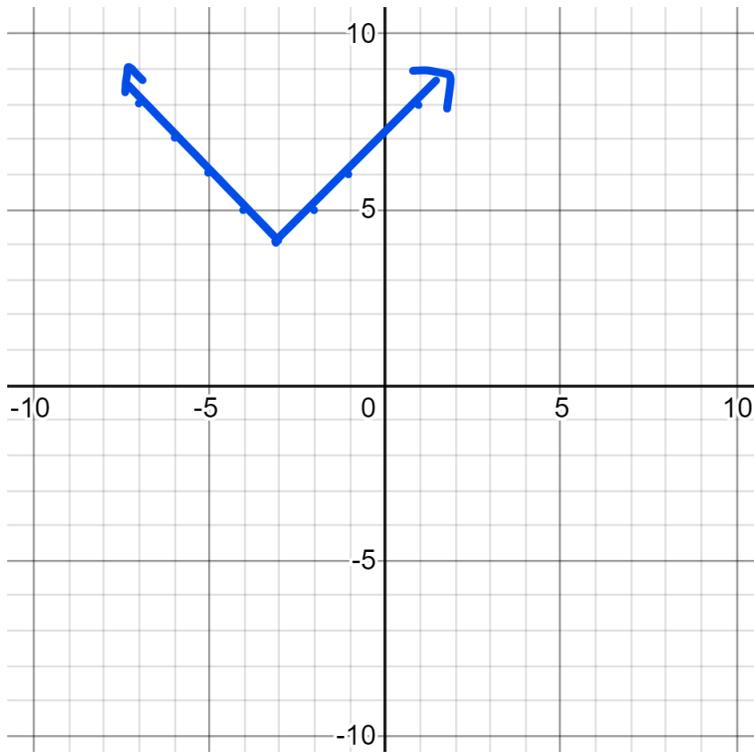
$$F(X) = -|X - 1| - 1$$



Summary: This problem was not hard. I remembered that $X-1$ shifts it right, and the negative signs flips it upside down and the -1 shifts it 1 unit down.

Page 156 Question 6 Sketch a graph of the following function

$$F(X) = |X + 3| + 4$$



This was also easy, I knew that the $X+3$ shifted it 3 units left and that the $+4$ would shift it 4 units up. The only tricky part is remembering that it is shifted the opposite way of the sign inside of the absolute value bars.

Page 156 Question 12 Solve for this equation.

$$|4X + 2| = 15$$

$$4X + 2 = 15$$

$$4X = 13$$

$$X = 13/4$$

$$|4X + 2| = -15$$

$$4X + 2 = -15$$

$$4X = -17$$

$$X = -17/4$$

$X=13/4$ or $17/4$

Summary: This problem was not too difficult. I just solved for the first equation and once I got that answer, I changed the 15 to -15 and solved it again.

Page 156 Question 15 Solve this equation

$$3|X + 1| - 4 = -2$$

$$3|X + 1| = 2$$

$$|X + 1| = 2/3$$

$$|X + 1| = 2/3$$

$$X + 1 = 2/3$$

$$X = -1/3$$

$$|X + 1| = -2/3$$

$$X + 1 = -2/3$$

$$X = -5/3$$

$X=-1/3$ or $-5/3$

Summary: This one was a little bit harder because I had to Isolate the Absolute value bars before I could begin solving. After adding four and dividing the 3 it became a matter of solving the equation which I did not have trouble with.

Page 156 Question 17 Find each horizontal and vertical intercepts for

$$F(X) = 2|x + 1| - 10$$

It crosses X at (-5.5,0)

It crosses Y at (0,-9)

Summary: This problem was easy all I had to do was graph it and find the intercepts.

Page 157 Question 20 Find the horizontal and vertical intercepts for the graph

$$F(X) = -2|X + 1| + 6$$

It crosses X at (-6,0)
It crosses Y at (-12,0)

Summary: For this problem all I had to do was graph them and find where it crossed the X and Y axis.

Page 157 Question 21 Solve each inequality

$$|X + 5| < 6$$

$$X + 5 < 6$$

$$X < 1$$

$$|X + 5| > -6$$

$$X > -11$$

X_i-11 and X_j1

Summary: This problem was easy I just had to remember to flip the inequality sign when changing the sign.

Page 157 Question 22 Solve each inequality

$$|X - 3| < 7$$

$$X < 10$$

$$|X - 3| > -7$$

$$X > -4$$

X_j10 and X_i-4

Summary: This problem was easy just like the last one. I just followed steps until there was nothing else I could solve for.