# Second Project Assessment

Jacob Dyer

September 22, 2020

Section 2.1
page 110

Problem 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.

Answer: $P(t) = 1,700t + 45,000$

I found this quite easy because all you had to do is put the information into an equation where the number of people increased by each year and multiply by how many years it was after 2003 and add 45,000.

Problem 2:
A town's population has been growing linearly. In 2005, the population was 69,000, and the population has been growing by 2500 people each year. Write an equation,
P(t), for the population t years after 2005.

Answer: $P(t) = 2,500t + 69,000$

This question was simple when all you have to do is place the information into an equation. multiply the amount of years that have gone by, by the number of people increasing per year and add 69,000 to it.

Determine if each function is increasing or decreasing

Problem 7: $f(x) = 4x + 3$

Answer: This line is increasing.

This was an easy task since the only thing to effect the slope of it being positive or negative is the number in front of the variable which is a positive number which makes the slope positive.

Problem 10: $b(x) = 8 - 3x$

Answer: This line is decreasing.

This was a simple problem as well since the number that is in front of the variable is a negative number the slope of the line is decreasing.

Find the slope of the line that passes through the two given points

Problem 17: (2, 4) and (4, 10)
$4 - 10/2 - 4 = -6/-2 = 3$

Answer: The slope is 3.

This was an easy problem because all you had to do was subtract the first y variable by the second y variable over the first x variable being subtracted by the second x variable.

Page 111

Problem 28:
A city's population in the year 1958 was 2,113,000. In 1991 the population was 2,099,800. Compute the slope of the population growth (or decline) and make a statement about the population rate of change in people per year.

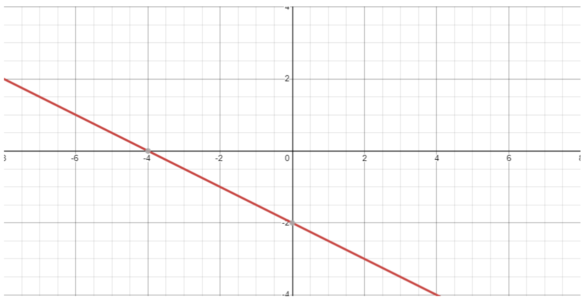
$$2,099,800 = m(33) + 2,113,000$$
$$-13,200 = m(33)$$
$$-13,200/33 = m$$
$$-400 = m$$

Answer: -400 people lost over x amount of years
This was an easy problem, all you have to do is put the total population as the y variable and set it equal to 33m + 2,113,000, then subtract the number without the variable, then divide by 33 to notice that the population decreasing number is -400.

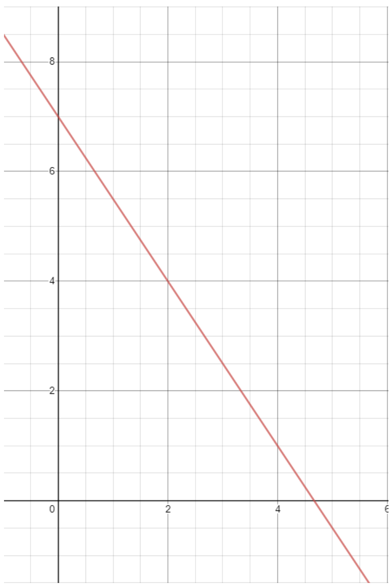
Section 2.2
page 125

Sketch a line with the given features

Problem 7: An x-intercept of (-4, 0) and y-intercept of (0, -2)

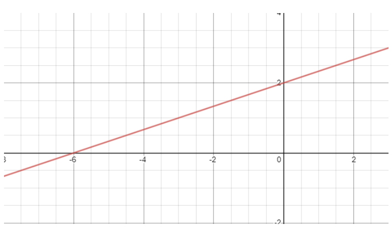


Problem 9: A vertical intercept of (0, 7) and slope -3/2




Sketch the graph of each equation

Problem 15: $h(x) = 1/3x + 2$



Problems 7, 9, and 15 were easy to graph because I used Desmos.com to graph them.

page 126

Problem 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)
Answer: g(x) = 3/4(x + 2) - 4

B. What is the slope of this line?
Answer: the slope is 3/4

c. Find the vertical intercept of this line.
Answer: the y-intercept is (0,-2.5)
This problem was quite confusing because I didn't learn about this before so I had to look up a tutorial on youtube on how to approach this. After watching multiple videos I was able to figure out how to solve these types of problems.

Find the horizontal and vertical intercepts of each equation

Problem 29: f(x) = -x + 2
Answer: the x-intercept is 2 and the y-intercept is 2
This is an easy question. if there's a number that is being added or subtracted to the equation, that number is the y-intercept and creating a graph made it easy to find that the x-intercept is -2.

page 127

Given below are descriptions of two lines. Find the slopes of Line 1 and Line 2. Is each pair of lines parallel, perpendicular or neither?

Problem 35: Line 1: Passes through (0,6) and (3,-24)
Line 2: Passes through (-1,19) and (8,71)

Line 1: $6 - -24/0 - 3 =$ 30/-3 = -10
Line 2: $19 - -71/ - 1 - 8 =$ 90/-9 = -10
Answer: parallel
This was quite easy. After finding the slope-intercepts of each line you can clearly tell that with the same slope, the two lines will never intercept each other.

Problem 40: Write an equation for a line parallel to f(x) = -5x - 3 and passing through the point (2,-12)

Answer: f(x) = -5x - 2

This was an easy problem. all you have to do is use the same slope and raise the y-intercept by 1 since the slope is 5 unites down and 1 unit to the right, you could easily notice that with a y-intercept of -2 the line will pass though the point (2,-12).

Section 2.3

Page 138

Problem 5:

In 1991, the moose population in a park was measured to be 4360. By 1999, the population was measured again to be 5880. If the population continues to change linearly,

A. Find a formula for the moose population, P.

$5880 = m(8) + 4360$ $m = 190$

Answer: $P = 190x + 4360$

B. What does your model predict the moose population to be in 2003?

$P = 190(12) + 4360$

Answer: $P = 6640$ moose

This was an easy question since you just have to find the population increase slope of moose with the population of the year given and subtract the starting population by the new population and divide by the number of years that passed. Then to find the answer to part B you multiply the answer from part A to the number of years gone by and at the original population.

Problem 6: In 2003, the owl population in a park was measured to be 340. By 2007, the population was measured again to be 285. If the population continues to change linearly,

A. Find a formula for the owl population, P.

285 = m(4) + 340

Answer: P = -14x + 340

B. What does your model predict the owl population to be in 2012?

P = -14(9) + 340

Answer: 214 owls

This is like the moose population problem but it's decreasing. All you have to do is have to find the population decreasing slope of owls with the population of the year given and subtract the starting population by the new population and divide by the number of years that passed. Then to find the answer to part B you multiply the answer from part A to the number of years gone by and at the original population.

Page 139: Find the area of a triangle bounded by the y axis, the line f(x) = -6/7x + 9, and the line perpendicular to f(x) that passes through the origin.

A = 1/2bh

A = 1/2 x 9 x 4

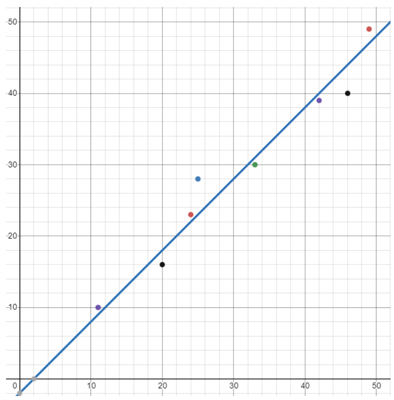
Answer: the Area of the triangle is 18 and the Perpendicular line is f(x) = 7/6x

I rounding the height off to the nearest whole number so the Area wasn't a strange number, but I used a graph to find out the height and base which was a height of 4 units and a base of 9 units. And to find the perpendicular line is by flipping the fraction and making it positive.

Section 2.4

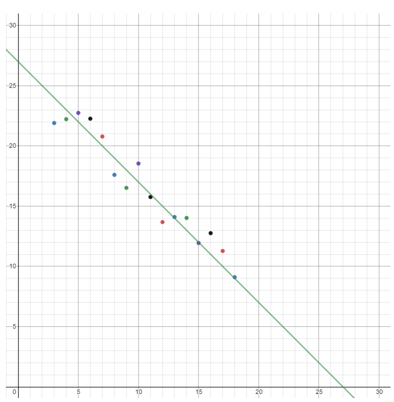
Page 147

Problem 1: The following is data for the first and second quiz scores for 8 students in a class. Plot the points, then sketch a line that fits the data.



Using Desmos.com I was able to put the points in and find the line of best find by just using 1 as the slope and -1 as the y-intercept to split the points evenly on each side of the line.

Problem 5: Based on each set of data given, calculate the regression line using your calculator or other technology tool, and determine the correlation coefficient.



The correlation coefficient x = -1 because when you put the y-intercept as 27 the best line of fit would be y =-1x+27.

Page 148

Problem 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

y = -1.341(11) + 32.234

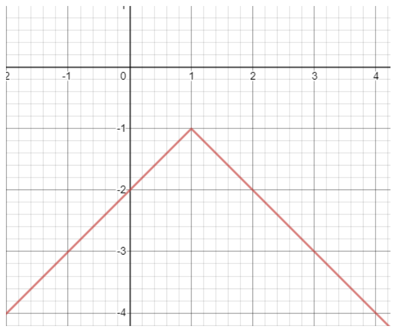
Answer: y = 17.483
This problem was easy, all you had to do was multiply 11 and -1.341 and add 32.234 to get 17.483

Problem 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?

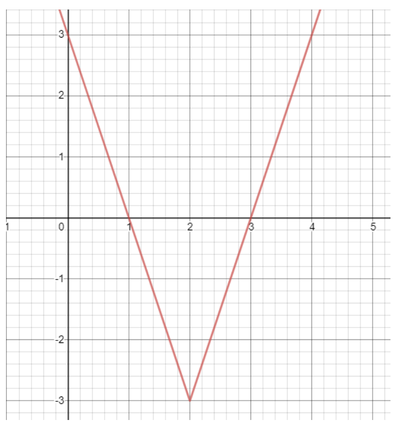
y = 0.476x - 926.6
35 = 0.476x - 926.6
x = 30
Answer: the year of the rate exceeding 35 percent is 2020.
This problem was a bit confusing. I had to consult with my classmates and look up some videos on how to do this because I never learned this, but I used Desmos.com to help be get the correct answer.

Page 156
Sketch a graph of each function

Problem 5: f(x) = -—x-1—-1



Problem 8: f(x) = 3—x-2— - 3

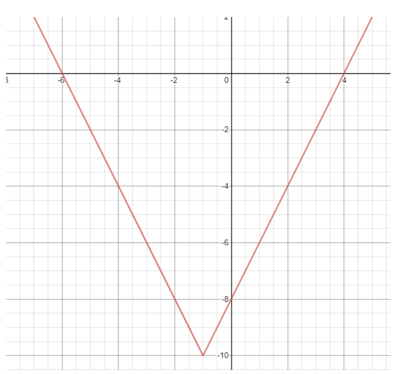


Using Desmos.com made problems 5 and 8 quite easy to sketch because all you have to do is put in the equations and it makes the graph for you.

Page 157

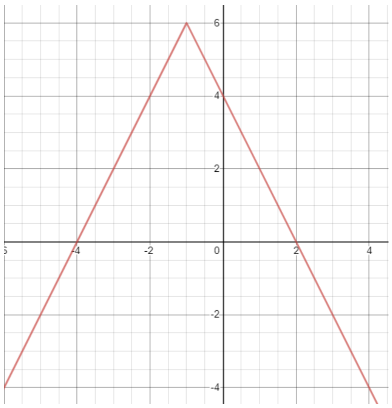
Find the horizontal and vertical intercepts of each function

Problem 17: f(x) = 2—x+1— - 10



Answer: the y- intercept is (0,-8) and the x-intercepts are (-6,0) and (4,0)

Problem 20: -2—x+1—+6




Answer: The y-intercept is (0,4) and the x-intercepts are (-4,0) and(2,0) Problems 17 and 20 were easy because after using Desmos.com to find the slopes and vertex, it was easy to find the y-intercepts and x-intercepts.

Solve each inequality

Problem 21: $|x+5| < 6$

Answer: $-11 < x < 0$

Problem 24: $|x+4| <= 2$

Answer: $-6 <= x <= -2$

Problems 21 and 24 were quite simple because since the equation part with the x variable are absolute numbers, all you have to find is what adds with the number given in the absolute signs that isn't greater than or equal to the number that is on the opposite side of the less than sign, or the added numbers are equal to or less than the the number opposite of the sign.