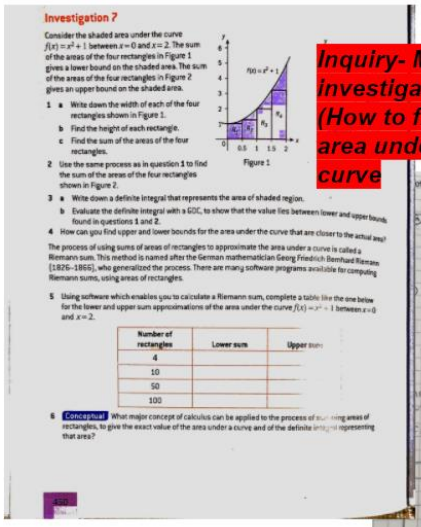
Math



Investigation 7

Consider the shaded area under the curve $f(x) = x^2 + 1$ between $x = 0$ and $x = 2$. The sum of the areas of the four rectangles in Figure 1 gives a lower bound on the shaded area. The sum of the areas of the four rectangles in Figure 2 gives an upper bound on the shaded area.

1 a Write down the width of each of the four rectangles shown in Figure 1.
b Find the height of each rectangle.
c Find the sum of the areas of the four rectangles.

Figure 1

2 Use the same process as in question 1 to find the sum of the areas of the four rectangles shown in Figure 2.

3 a Write down a definite integral that represents the area of shaded region.
b Evaluate the definite integral with a GDC, to show that the value lies between lower and upper bounds found in questions 1 and 2.

4 How can you find upper and lower bounds for the area under the curve that are closer to the actual area?

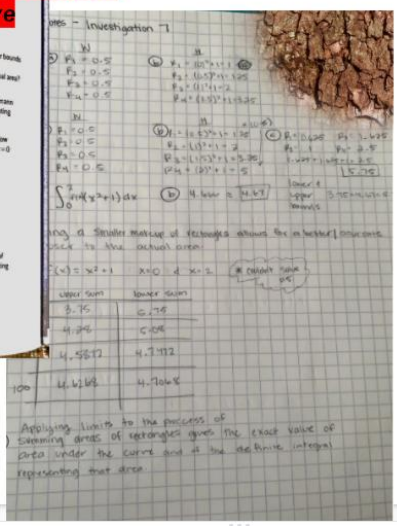
The process of using sums of areas of rectangles to approximate the area under a curve is called a Riemann sum. This method is named after the German mathematician Georg Friedrich Bernhard Riemann (1826–1866), who generalized the process. There are many software programs available for computing Riemann sums, using areas of rectangles.

5 Using software which enables you to calculate a Riemann sum, complete a table like the one below for the lower and upper sum approximations of the area under the curve $f(x) = x^2 + 1$ between $x = 0$ and $x = 2$.

Number of rectangles	Lower sum	Upper sum
4		
10		
50		
100		

6 Conceptual What major concept of calculus can be applied to the process of using areas of rectangles, to give the exact value of the area under a curve and of the definite integral representing that area?

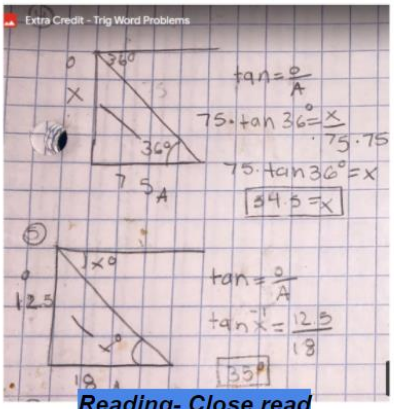
Inquiry- Math investigations (How to find area under the curve



Investigation 7

Applying limits to the process of summing areas of rectangles gives the exact value of area under the curve and of the definite integral representing that area.

4. A person in a hot air balloon is looking down with an angle of depression of 36° at their car 75 feet away (straight line distance). How high is the balloon?
5. Find the angle of elevation of the sun when a 12.5 meter tall telephone pole casts an 18 meter long shadow.



Reading- Close read to draw triangles in geometry

Math

Collaboration- learning how to use graphing calculator

GDC Scavenger Hunt

Do you know how to use your GDC? Let's find out! You are going to be assigned to a group of four students. Each student will have a specific CPM team role that they will be responsible for during this group activity.

Task Manager – Your role is to make sure each student is participating and if their GDC will be turned on, student is still responding by having their microphone on or typing in the chat. You will have a small participation sheet to fill out at the end of the scavenger hunt and will be turned in for credit.

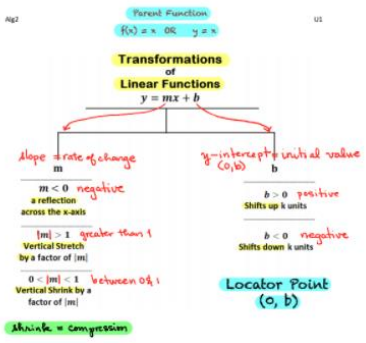
Recorder/Reporter – Your role is to write each student's name in your group as the students that are able to find what is being asked in the scavenger hunt. Place a check mark next to each student's name that gets the answer correct. Keep this record and will be turning it in for credit at the end of the class.

Resource Manager – Your role is to explain to the group how they would get the hunt clue on their calculator if someone is unsure. Keep note of what your team does because you will have to fill out a quick worksheet for credit.

Facilitator – Your role is to announce to the group the scavenger hunt clues. Have your camera on and analyze the calculator screen of your group members (You may have to do these activities on your GDC to check your solutions) Keep track of the scavenger hunt clues that the group is responsible turning in a list of the ones you asked and the ones you may not have had time

Directions: Each student will start each scavenger hunt clue with their car facilitator. The facilitator will then read the group the clue. Every other te to find the scavenger hunt clue on their GDC. Once you have found what your camera with your GDC screen in view for the facilitator to check. If the answer the facilitator will say "correct". Once each student has presented their screen, the recorder/reporter will put a check mark next to each group member's name that got it correct. The resource manager will ask if anyone has any questions, answer them, and write down any notes. The task manager will keep track of the participation. You will then repeat this process. At the end of the class, I will give you about 10 minutes to complete your team role responsibility and turn it in on Google Classroom.

Organization



Writing in math:
12-20 page math exploration

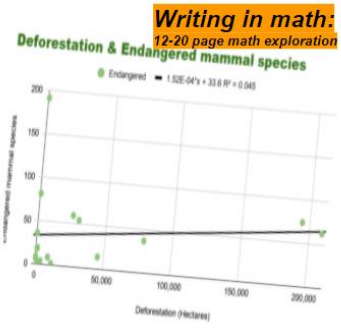


Figure 7 Deforestation and endangered mammal species regression line graph

finding the linear regression equation was correct because both my work and google 52x+33.6. As seen from this graph this means as deforestation increases by 50,000 so imal species increases by 50. Meaning the graph has a positive correlation as the goes up. To add to this the Pearson correlation coefficient (R) is displayed differently on the google sheets because the R was squared however using previous calculated R = 0.212919784 or ≈ 0.22 and squaring the number is equivalent to 0.0453348344 or ≈ 0.045. This displays my Pearson correlation to be correct in representing the weak correlation between deforestation and endangered mammal species.