Math152 at the University of Tennessee, Knoxville - Chat for February 3, 2016 with the course instructor, Louis Gross.

I will be online starting at 8:30PM and will be happy to answer questions regarding any aspect of the course, assignments, etc. though for this evening I suspect that questions will be mostly about Chapters 15-17 and the upcoming exam next Tuesday. You can type in this document to ask questions.

When you ask a question, please do not use your name because this document will be saved and publicly posted after we close it. I will be on-line at least until 9:30PM but will stay on longer if there are still questions. Note that I do not know the identity of anyone posting questions - each participant shows up as “Anonymous” animal.

I am online now - Lou

Could you please work out number 2 and number 9 on the sample exam? Thank you!

OK - for #2 see below for the general method to find the horizontal asymptote. So we want to find $\lim_{I \to \infty} P(I)$ - do you want me to show this calculation?

For #9 you first need to determine how you are going to take the average rate of change and since the full day varies from t=0 (midnight) to t=24 (the next midnight) the logical way to get the average rate of change is to take M(24)-M(0) and divide this by 1 (if you are calculating the average rate of change per day. For 9 (b) you need to decide how you want to estimate the rate of change at a particular time - as we saw in class today there are several possibilities - you need to choose one, say what it is, then do the calculation. Do you want me to do a calculation for this?

Are you going to post the practice exam answers on the nimbios website like you did last semester? Thanks

I posted a brief set of answers

Could you please work explain how to find asymptotes of a function for example. 15.7b?

Sure - there are two kinds of asymptotes - horizontal and vertical. Vertical asymptotes happen when the function "blows up" meaning that the function values increase and increase without bound near there, or "blow down" meaning that the function values get larger and larger negatively (go to minus infinity) near there. To find these, you are looking for cases in which the function has a zero in the bottom of a fraction and the top in that fraction is not zero.

Now for horizontal asymptotes, you are looking for cases when as the independent variable (often time but in 18.8 this is light level I) gets larger and larger (goes to infinity) or smaller and smaller (goes to negative infinity) and the function has value that approaches some number. The value the function approaches is the horizontal asymptotic value and if it is for example R then we say y=R is the horizontal asymptote. To find the horizontal asymptote (there may not be one) you want to let the variable that the function depends on get larger and larger or smaller and smaller (go to negative infinify) and see of the function approaches a limit. So in general for a function f(x) if $\lim_{I \to \infty} P(I) \lim_{t \to \infty} f(x) = L$ then we say there is a horizontal asymptote at y=L. In the case of problem 15.8, the function is P(I) (for the two different types of leaves) and so we look at $\lim_{I \to \infty} P(I)$ and see if this limit exists - if so it is the horizontal asymptote.

OK?

Okay, in problem 15.7b

There is an asymptote at 155, but i'm getting confused how this answer was come about. The problem is D(t)= 155(1-e^(-0.00133t). What is did was solve for t=0 but that gives me zero.

What we are after to find a horizontal asymptote in this case is $\lim_{t \to \infty} D(t)$ and if you let t get larger and larger the exponential term gets smaller and smaller so the only term that is left is 155 so this is the horizontal asymptotic value. Do you understand the meaning of this in terms of the problem? D(t) is sediment depth so what happens is that after a long time the sediment depth gets closer and closer to 155.

Yes. It means that it approached 155 but does not touch the imaginary line at 155 if we were to graph this function. Which i guess means that the 155 is the depth of the water source. This helps me though. I tried the problem again and got 155. Thank you

The D(t) is the depth of the sediment at the bottom of the lake - it doesn't really have anything to do with the depth of the water source in this problem.

Okay, I see what you are saying now

I am going offline now - goodnight - Lou