Math 2143 - Brief Calculus with Applications

Written Assignment 2 - Due 2018.06.17

Directions: Please answer the following question in complete sentences. Be sure to label all geometric objects in any illustrations (if any). I will accept an answer in a scanned image format, as a pdf, or as a picture taken and sent from your awesome smart phone.

Question: Find a formula for the nth derivative of the following function:

$$f(x) = \frac{1}{x+1}.$$

I.e. find a pattern such that if someone asks you what the 12th derivative of $f(x)$ is, you do not need to take 12 derivatives to write down the answer. It may help to remember the definition of the factorial (!).

Using your work for the function $f(x)$, try to find a closed form for the nth derivative of

$$g(x) = \frac{1}{3x+1}.$$