Resolved Unresolved @52_f4

Actions

Nandini Bhat 2 months ago

I did the quiz after doing question 3 from this week's assignment, and it helped a lot because I'm more familiar with the features of a function's derivative now. However, not every answer was immediately obvious- I had to skip the first function and get back to it later, because I wasn't entirely sure whether it really hit 0 or not. I did the 2nd, 3rd, and 4th functions first, because they seemed more straightforward.

~ An instructor (Elisabeth stade) thinks this is a good comment ~

helpful! | 1

Reply to this followup discussion

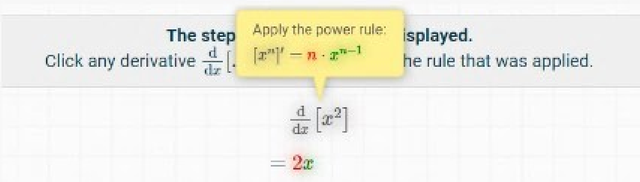
Resolved Unresolved @42_f1

Actions

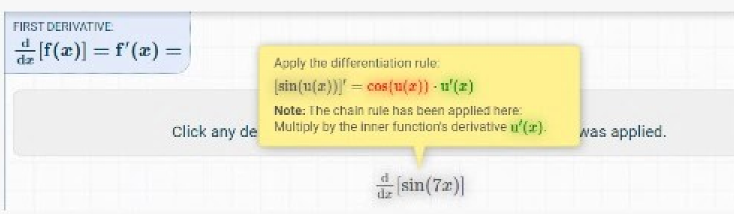
Nandini Bhat 2 months ago

I used this calculator: https://www.derivative-calculator.net/ . You can enter a formula f(x), which is then graphed along with the formula of f'(x). Next to the graph, you can enter any value of x to find the derivative at that point.

The person who made it is super transparent about how it works in the "How the Derivative Calculator Works" section at the bottom of the page. One part of this section states "Like any computer algebra system, it applies a number of rules to simplify the function and calculate the derivatives according to the commonly known differentiation rules." The differentiation rules link leads to the Wikipedia page for the same. I noticed that when I selected the "show steps" option for the formula x^2, the power rule was used:



when I tried it for the formula $sin(7x))$, the chain rule was used:



So I'm not entirely sure if this calculator uses the tangent or secant methods at all. I did notice that the first proof on the Wikipedia page was using the tangent method, so maybe these rules are based off of it? Definitely a little confused, though. I used the secant method for my code in #1 because it showed greater accuracy last week. If online calculators do use the tangent method, is it possible that it's less expensive from a computation perspective?

helpful! | 0

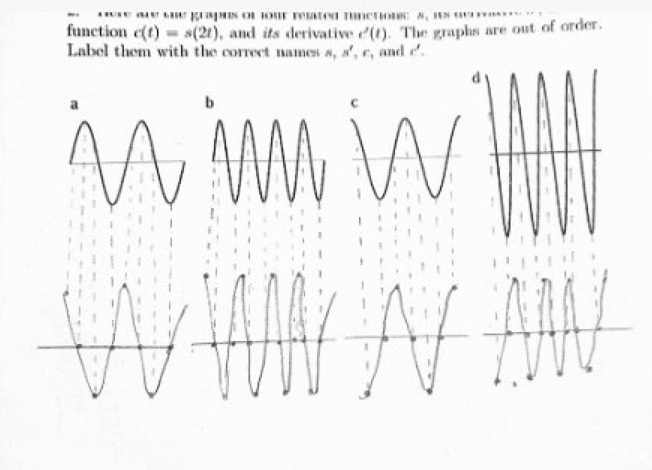
Resolved Unresolved @41_f2

Actions

Nandini Bhat 2 months ago

The first thing I did was try to figure out which of the graphs was related to s and c, either by being the function itself or the derivative. The lines look like sin or cos waves to me, and I know these show a greater frequency (more waves) when they increase in value. Therefore, as $c(t) = s(2t)$, the function c and its derivative should show a greater frequency- this means that graphs b) and d) could be either c or c', while graphs a} and c) could be either s or s'.

Now to find which of the pairs are the derivatives, I used the graph diagrams on page 145 and the feature table from page 146 to make rough graphs of what the derivative should be for each function:



As can be seen, the derivatives for graphs c) and d) start out negative, and neither graph a) nor graph b) match that. However, the derivate of graph a) matches graph c), and the derivative of graph c) matches graph d)- both start out positive in the beginning, gradually decrease, hit 0, then go negative. Based on this, graph a) is s, graph c) is s', graph b) is c, and graph d) is c'.

helpful! | 1