Resolved Unresolved @117_f1

Actions

Nandini Bhat 4 days ago

It took me a while to wrap my head around the FTC. The simplest idea here is that the indefinite integral of a function IS its antiderivative. The book and lectures lay out the idea well, but when I started trying things out on my own I found myself going in circles at first (yay, math panic). Writing out the proofs for the FTC myself, and writing out the full set of steps for problems d and e in this worksheet led to the lightbulb finally going off in my head- pretty good "a-ha" moment. The graphs at the end help tie everything together.

helpful! | 0

Resolved Unresolved @116_f1

Actions

Nandini Bhat 3 days ago

Question 6 here kind of confused me- because this specific shaded region is triangular, I was thinking about in terms of the formula for area of a triangle, and it threw me off. The final answer I marked was $\int_{x_5}^{x_6}(f(x) - f(x_6)) \cdot \Delta x$. I figured it's because this expression is essentially finding the area of the curve under $f(x)$ over the interval $[x_5, x_6]$, and then subtracting the area of the box for $f(x_6)$ from this total area. That would leave behind the area of the shaded region. I guess it's like finding the error as described in the textbook but over a smaller interval. I'm still a little bit unsure of my answer though, and would really be interested in how others approached this.

helpful! | 0

Resolved Unresolved @117_f2

1 day ago

I'm struggling with the answer to part e: the anti-derivative of the integral from 0 to x of t^2 dt (I'm typing from my phone, I'll try to add the actual formula later. I feel like the answer should be x^3/3 but that doesn't match any of the answers provided. What am I missing?

helpful! | 0

Nandini Bhat 1 day ago

Actions

The way I looked at it is- the value of this integral is $\frac{x^3}{3}$. In part d, we simply had to take the derivative of this integral, giving us x^2. In part e, you now have to find the antiderivative of this integral instead. $\frac{x^3}{3}$ is the base you have to work off and you've got that down, so just one step is missing, which is finding the antiderivative.

$\frac{x^3}{3} = \frac{1}{3} \cdot x^3$ Separating coefficient

$= \frac{1}{3} \cdot \frac{x^{3+1}}{3+1}$ Using power rule for integration (finding antiderivative of x^3)

$= \frac{1}{3} \cdot \frac{x^4}{4}$

$= \frac{x^4}{12}$

helpful! | 0