

Math 229 Quiz 12a

You may use only Julia or `math229.github.io` – no other websites.

NAME: Solution

Problem 1. Let $f(x) = \frac{2 \sin(3x + 1)}{x + 2}$. Write your answers to five decimal places.

a. Use the command `integrate` to find $\int_0^5 f(x) dx$. Explain your answer.

julia returns $\int_0^5 \frac{2 \sin(3x+1)}{x+2} dx$, it can't integrate this symbolically

b. Approximate $\int_0^5 f(x) dx$ by Riemann sums with these methods and values of n :

	Left endpoint method	Right endpoint method	Simpsons method	Trapezoid method
$n = 100$	0.32818	0.28499	0.30551	0.30509
$n = 1000$	0.30781	0.30319	0.30551	0.30556

c. What is the answer using the command `quadgk`?

0.30551

d. How accurate is the answer given by `quadgk`?

9.17394×10^{-12}

e. Which is the best answer in the table above?

simpsons.

Math 229 Quiz 12b

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NAME: Solutions

Problem 1. Let $f(x) = \frac{3 \sin(4x+1)}{x+2}$. Write your answers to five decimal places.

- a. Use the command `integrate` to find $\int_0^3 f(x) dx$. Explain your answer.

julia returns $3 \int_0^3 \frac{\sin(4x+1)}{x+2} dx$, which means it can't integrate it symbolically

- b. Approximate $\int_0^3 f(x) dx$ by Riemann sums with these methods and values of n :

	Left endpoint method	Right endpoint method	Simpsons method	Trapezoid method
$n = 100$	0.11020	0.07989	0.09505	0.09505
$n = 1000$	0.09660	0.09357	0.09508	0.09508

- c. What is the answer using the command `quadgk`?

0.09508

- d. How accurate is the answer given by `quadgk`?

1.37113×10^{-13}

- e. Which is the best answer in the table above?

Simpson's