

M250 Practice Exam 4.4-5.2
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Definitions, integration by substitution, $\ln x$, and numerical integration. Show your work on 7-15.

1. State the definition for the derivative of $f(x)$:
2. State the definition for the definite integral of $f(x)$ on the interval $[a,b]$:
3. State the definition for the indefinite integral of $f(x)$:
4. State the Fundamental Theorem of Calculus:
5. What is the average of $f(x)$ on the interval $[a,b]$?
6. What is the definition for $\ln(x)$ as given in the calculus class:

7. Use the Trapezoid rule and Simpson's rule with $n=6$ to evaluate the integral:

$$\int_{0.4}^{1.0} (1/t) dt$$

What is the exact value?

8. $\int \frac{x \sin(x^2)}{\cos(x^2)} dx$

9. $\int x\sqrt{x+5} dx$

10. $\int \frac{\sec(x) \tan(x)}{\sec(x)} dx$

11. $\int (\sin^2 x + 1/\sin x) \cos(x) dx$

12. $\int_3^{27} (1/t) dt$

13. The average of $y = 1/x$ on $[1, e]$ is

14. $\int x \sec^2(x^2 + 2) dx$

15. $\frac{d}{dx} \ln|\cos(x)|$