

My Chapter 5 Integration Project

I, _____, claim that the work on this project is completely my own and that I did not consult any person, living, dead, virtual, or undead for help on these problems. [Feel free to consult your notes or your textbook]

Show all steps/work. No need to simplify numerical solutions for the definite integrals, or algebraic solutions for indefinite integrals.

1.
$$\int_1^{e^2} \frac{\ln x^3}{x} dx$$

2.
$$\int_1^{e^2} \frac{(\ln x)^2}{x} dx$$

3.
$$\int_{\pi/4}^{\pi/2} \cot \theta d\theta$$

4. $\int_0^{\pi/2} (e^{\sin x})(\cos x) dx$

5. $\int_0^{\ln 4} e^{3x} dx$

6. $\int_{-4}^1 \frac{1}{x+5} dx$

7. $\int_0^1 \frac{2}{1+x^2} dx$

8. Let $F(x) = \int_5^{e^{2x}} \ln t \, dt$. Find $F'(x)$

9. Let $G(x) = \int_0^x e^{\cos t} \, dt$. Find $G(0)$

10. Let $H(x) = \int_1^{10x} \ln e^t \, dt$. Find $H'(x)$

11. $\int \frac{dx}{\sqrt{81-x^2}}$

12. $\int \frac{2x}{\sqrt{81-x^2}} \, dx$

13. $\int \frac{-2x}{\sqrt{81-x^2}} \, dx$

14. $\int \frac{dx}{e^x}$

15. $\int \frac{e^{2x} + e^x}{e^x} dx$

16. $\int e^x(1 + e^x) dx$

17. $\int \frac{x^3 + 1}{x} dx$