

I. FIND THE DERIVATIVE OF EACH FUNCTION

1. $f(x) = \tan(\ln(x))$
2. $f(x) = x^4 e^{\frac{1}{\sqrt{x}}}$
3. $f(x) = \frac{x + \ln(x)}{e^x - 1}$
4. $f(x) = e^{\sin(x)}$
5. $f(x) = \ln\left(\sqrt[4]{x^3 + 1}\right)$
6. $f(x) = x^3 \ln(x^2 + 2)$
7. $f(x) = \ln(\ln(x^2))$
8. $f(x) = \ln(x^3) e^{\sqrt{1-3x}}$
9. $f(x) = \frac{e^{(4x)} + x^2}{\sec(x) + \ln(x)}$
10. $f(x) = \ln(\sec(x))$
11. $f(x) = 5x \sin^{-1}(x)$
12. $f(x) = \frac{\tan^{-1}(x^2)}{x^2 + x}$
13. $f(x) = \sec^{-1}(2x^3)$
14. $f(x) = \ln(\tan^{-1}(x))$

II. FIND EACH INDEFINITE INTEGRAL.

15. $\int \frac{1}{x+5} dx$
16. $\int \frac{\ln(x)}{x} dx$
17. $\int e^x \cos(e^x) dx$
18. $\int x^2 e^{x^3-4} dx$
19. $\int \frac{x^2 - 2}{x^3 - 6x + 1} dx$
20. $\int \frac{\sec(x) \tan(x)}{\sqrt{1+3\sec(x)}} dx$
21. $\int \frac{8e^{\sqrt{x}}}{\sqrt{x}} dx$
22. $\int \frac{e^{5x}}{5 + 5e^{5x}} dx$
23. $\int \frac{4}{\sqrt{81-x^2}} dx$
24. $\int \frac{8x}{5+x^4} dx$
25. $\int \frac{3}{5x\sqrt{16x^2-9}} dx$
26. $\int \frac{x+2}{4+x^2} dx$

III. EVALUATE EACH DEFINITE INTEGRAL.

27. $\int_1^e \frac{1}{x(1+\ln(x))} dx$
28. $\int_0^{\pi/2} 2 \sin(x) e^{\cos(x)} dx$

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