

Test Review e and ln

1. Solve for x: $\ln x - \ln\left(\frac{1}{x}\right) = 4$	2. Solve for x: $\ln\left(\frac{x}{4}\right) = 2$
3. $y = \ln(e^{\sin x})$ find y'	4. $y = \ln(e^{-3x})$ find y'
5. $f(x) = e^{\ln(\tan x)}$ find f'	6. $f(x) = e^{-\ln x}$ find f'
7. $y = \frac{\ln x}{x^2}$ find y'	8. $y = \frac{x}{\ln x}$ find y'
9. $y = x^2 \ln x$ find y'	10. $y = x \ln x^3$ find y'
11. $\frac{d}{dx} \ln\left(\frac{x}{2-x}\right) =$	12. $\frac{d}{dx} \ln\left(\frac{x^2}{3+x}\right) =$
13. $f(x) = \ln \sqrt[3]{x}$ find f'	14. $f(x) = \ln \sqrt{\sin x}$ find f'
15. $y = e^{\sin x}$ find y'	16. $y = e^{\cot x}$ find y'
17. $\frac{d}{dx}(5^x) =$	18. $\frac{d}{dx}(5^{\tan x}) =$
19. $f(x) = e^{\frac{1}{3x}}$ find f'	20. $f(x) = e^{-\frac{1}{x}}$ find f'
21. $y = \ln(x^3 + y^3)$ find y' at (0,1).	22. $y = \ln(x^3 + y^2)$ find y' at (1,0).
23. $\frac{d}{dx}(x^x) =$	24. $\frac{d}{dx}(x^{\sin x}) =$
25. The value of the derivative of $y = \frac{\sqrt[3]{x^3 + 8}}{\sqrt{x^2 + 15}}$ at $x = 1$.	26. The value of the derivative of $y = \frac{\sqrt{x^2 + 12}}{\sqrt[3]{x^3 + 19}}$ at $x = 2$.
27. $\int_0^1 x^3 e^{x^4} dx$	28. $\int_0^1 x e^{x^2} dx$
29. $\int_0^{\ln 4} -e^{-2x} dx$	30. $\int_0^{\ln 2} -e^{-3x} dx$
31. $\int_0^{\frac{\pi}{2}} \frac{\cos x}{\sin x + 2} dx$	32. $\int_0^2 \frac{x^2}{x^3 + 2} dx$

33. $\int_1^2 \frac{x+4}{x^2} dx$	34. $\int_1^2 \frac{x^2+4}{x^3} dx$
35. $\frac{dy}{dx} = \cot x$, then $y =$	36. $\frac{dy}{dx} = \frac{4x^3}{x^4+1}$, then $y =$
37. $\int \frac{1+\ln x}{x} dx$	38. $\int \frac{1}{x \ln x} dx$
39. $\int \frac{e^x}{e^x+4} dx$	40. $\int \frac{e^x+2}{e^x} dx$

Answers:

1) e^2	2) $4e^2$
3) $\cos x$	4) -3
5) $\sec^2 x$	6) $-\frac{1}{x^2}$
7) $\frac{1-2\ln x}{x^3}$	8) $\frac{\ln x - 1}{(\ln x)^2}$
9) $x + 2x \ln x$	10) $3 + \ln x^3$
11) $\frac{2}{x(2-x)}$	12) $\frac{6+x}{x(3+x)}$
13) $\frac{1}{3x}$	14) $\frac{1}{2} \cot x$
15) $e^{\sin x} \cos x$	16) $-\csc^2 x e^{\cot x}$
17) $\ln 5 \cdot 5^x$	18) $\ln 5 \sec^2 x 5^{\tan x}$
19) $-\frac{1}{3x^2} e^{\frac{1}{3x}}$	20) $\frac{1}{e^{\frac{1}{x}} x^2}$
21) 0	22) 3
23) $(1 + \ln x)(x^x)$	24) $\left[\frac{\sin x}{x} + \ln x \cos x \right] x^{\sin x}$
25) 0.0252788	26) -0.030864
27) $\frac{1}{4}e - \frac{1}{4}$	28) $\frac{1}{2}e - \frac{1}{2}$
29) $-\frac{15}{32}$	30) $-\frac{7}{24}$
31) $\ln 3 - \ln 2$	32) $\frac{1}{3}(\ln 10 - \ln 2)$
33) $\ln 2 + 2$	34) $\ln 2 + 3/2$
35) $\ln \sin x + c$	36) $\ln x^4 + 1 + c$
37) $\frac{(1 + \ln x)^2}{2} + c$	38) $\ln \ln x + c$
39) $\ln e^x + 4 + c$	40) $x - \frac{2}{e^x} + c$