

HOW DO LUMBERJACKS DISTINGUISH ONE MELODY FROM ANOTHER?

If $y = [f(x)]^{g(x)}$ use logarithmic differentiation	If $y = [f(x)]^n [g(x)]^m$ use logarithmic differentiation
---	---

Match each function with the natural log of that function.

	2) $y = (\sin x)^x$	3) $y = x^{\sin x}$	4) $y = x^2$
5) $y = 2^x$	6) $y = (\ln x)^x$	7) $y = e^{\ln x}$	8) $y = (\ln e)^x$
9) $y = (x+1)^2(x-1)^5$	10) $y = (x+1)^2 \sqrt[5]{x-1}$	11) $y = \frac{(x+1)^2}{(x-1)^5}$	

Natural log of the function.

A. $\ln y = \sin x \ln x$	B. $\ln y = x \ln(\ln x)$	C. $\ln y = 2 \ln x$	D. $\ln y = \ln x \ln e$
F. $\ln y = x \ln x$	H. $\ln y = x \ln(\ln e)$	I. $\ln y = x \ln 2$	N. $\ln y = x \ln(\sin x)$
R. $\ln y = 2 \ln(x+1) + \frac{1}{5} \ln(x-1)$	S. $\ln y = 2 \ln(x+1) + 5 \ln(x-1)$		
T. $\ln y = 2 \ln(x+1) - 5 \ln(x-1)$	V. $\ln y = 2 \ln(x+1) - \frac{1}{5} \ln(x-1)$		

Match each function with the derivative of that function.

12) $y = x^x$	13) $y = (\sin x)^x$	14) $y = x^{\sin x}$	15) $y = x^2$
16) $y = 2^x$	17) $y = (\ln x)^x$	18) $y = e^{\ln x}$	19) $y = (\ln e)^x$
20) $y = (x+1)^2(x-1)^5$	21) $y = (x+1)^2 \sqrt[5]{x-1}$	22) $y = \frac{(x+1)^2}{(x-1)^5}$	

Derivatives.

A. $y' = x$	C. $y' = x^2$	E. $y' = 1$	F. $y' = 0$
G. $y' = 2x$	H. $y' = x^x \ln x$	I. $y' = 2^x \ln 2$	L. $y' = y(1 + \ln x)$
M. $y' = y \left[\ln(\ln x) + \frac{1}{\ln x} \right]$	N. $y' = y \left[\cos x \ln x + \frac{\sin x}{x} \right]$	O. $y' = y \left[\ln(\sin x) + x \cot x \right]$	
T. $y' = y \left[\frac{2}{x+1} + \frac{1}{5(x-1)} \right]$	U. $y' = y \left[\frac{2}{x+1} - \frac{5}{x-1} \right]$	Y. $y' = y \left[\frac{2}{x+1} + \frac{5}{x-1} \right]$	

6	20

22	9	16	2	15

12	13	15	15	18	10

10	8	20	11	8	17	16	4

		F												
7	5	1	19	18	10	18	14	21	5	3	21	5	13	14