Ws - Ln Integrals
Get Ready for the QUIZ!
AB Calculus

Integrate each.

1. $\int \frac{5x}{3x^2+4}dx$
2. $\int_e^{e^2} \frac{dx}{x\ln x}$
3. $\int \frac{x^3+3x-1}{x+2}dx$
4. $\int \frac{x^2+3x+2}{x^2+2}dx$
5. $\int \cot x\,dx$
6. $\int_0^2 \frac{x}{x^2+2}\,dx$
7. $\int \tan x\,dx$
8. $\int_e^{e^2} \frac{(\ln x)^2}{x}\,dx$
9. $\int \frac{x^2-4}{x}dx$
10. $\int \frac{x^4+x-4}{x^2+2}dx$
11. $\int \frac{(\ln x)^2}{x}dx$
12. $\int_0^1 \frac{x-1}{x+1}dx$
13. $\int_0^2 \frac{x^2-2}{x+1}dx$
14. $\int \frac{x}{x^2+1}dx$

Find the derivative.

15. $y=\ln(3x-2)^3$
16. $y=\ln|\cos x|$
17. $y=\ln\frac{\sqrt{x}}{(2x-5)^5}$
18. $y=\ln(\ln(4x))$
19. $y=4x^2\cdot\ln x$
20. $y=\ln x^2\cdot\cos(2x)$

21. Find dy/dx : $\ln(xy)-5x=25$
22. Use Logarithmic differentiation to find the derivative of $y=\frac{\sqrt{2x-3}}{(3x-1)^3}$.
23. Locate relative extrema for $y=4x-x\ln x$.

Answers

1. $\frac{5}{6}\ln\left(3x^2+4\right)+C$
2. $\ln 2$
3. $\frac{1}{3}x^3-x^2+7x-15\ln\left|x+2\right|+C$
4. $x+\frac{3}{2}\ln\left(x^2+2\right)+C$
5. $\ln\left|\sin x\right|+C$
6. $\ln\sqrt{3}$
7. $\ln\left|\sec x\right|+C$
8. 7/3
9. $\frac{1}{2}x^2-4\ln\left|x\right|+C$
10. $\frac{1}{3}x^3-2x+\frac{1}{2}\ln\left(x^2+2\right)+C$
11. $\frac{\left(\ln x\right)^3}{3}+C$
12. $1-\ln 4$
13. $-\ln 3=\ln\frac{1}{3}$
14. $\frac{1}{2}\ln\left(x^2+2\right)+C$
15. $\frac{9}{3x-2}$
16. $-\tan x$
17. $\frac{1}{2x}-\frac{10}{2x-5}$
18. $\frac{1}{x\ln\left(4x\right)}$
19. $4x+8x\ln x$
20. $-4\ln x\cdot\sin\left(2x\right)+\frac{2\cos\left(2x\right)}{x}$
21. $\frac{dy}{dx}=\frac{y\left(5x-1\right)}{x}$
22. $\frac{26-15x}{\sqrt{2x-3}\left(3x-1\right)^4}$
23. rel max at $x=e^3$