

The Natural Logarithmic Function- HW Problems

Find the derivative of the following functions.

1. $y = x \ln(x)$

2. $y = \cos[\ln(x)]$

3. $f(x) = [\ln(x)]^2$

4. $g(x) = \ln(x^2)$

5. $y = \ln(x^2 \sqrt{1+x^2})$

6. $y = \ln\left(\sqrt{\frac{1-x^2}{1+x^2}}\right)$

7. $y = \ln[\cos(t)]$

8. $f(x) = \ln[\cos^2(t)]$

9. $f(x) = [\ln(\tan(x))]^3$

10. $g(\theta) = \ln[\sec(\theta) + \tan(\theta)]$

Evaluate the following integrals.

11. $\int \frac{x}{x^2+1} dx$

14. $\int_1^e \frac{x^2-1}{x} dx$

12. $\int \frac{dx}{4+5x}$

15. $\int_1^e \frac{(\ln(x))^4}{x} dx$

13. $\int_0^{\frac{\pi}{2}} \frac{\sin(x)}{1+\cos(x)} dx$

16. $\int \frac{x+1}{x^2+2x-6} dx.$