Chapter 5 Add On Review

Find the derivative of each.

1. $y = \ln^3 x$

2. $f(x) = \dfrac{x^2}{\ln x}$

3. $y = 5\sin^{-1}(x^2)$

4. $y = \dfrac{\ln x}{5+x}$

5. $y = \dfrac{e^x - e^{-x}}{e^x + e^{-x}}$

6. $y = e^{x^2}$

Integrate each.

7. $\int_e^{11} \dfrac{dx}{x\ln x}$

8. $\int_0^2 \dfrac{e^x}{1+e^{2x}}\,dx$

9. $\int \dfrac{x\,dx}{x^2+1}$

10. $\int \tan(4x+2)dx$

11. Find $(f^{-1})'(a)$. $f(x) = \sqrt{x^3 + x^2 + x + 22},\ a = 5$

12. If $h(x) = x + \sqrt{x}$, find $h^{-1}(2)$.

13. If $f(x) = \dfrac{x}{\ln x}$, find $f'\left(e^2\right)$.

Find the derivative of each:

14. $y = 3^{-2x}$

15. $f(x) = \sin^{-1}(2x)$

16. $f(x) = 3\arccos(5x)$

17. $f(x) = 4^{x-5}$

Integrate each.

18. $\int \dfrac{4}{\sqrt{25-x^2}}\,dx$

19. $\int \dfrac{1}{36+4x^2}\,dx$

20. $\int xe^{3x^2+1}\,dx$

21. $\int 6^x\,dx$

22. $\int \dfrac{e^x}{1+e^x}\,dx$

23. Find $(f^{-1})'(a)$ for $f(x) = \dfrac{2}{x} - e^x$ at a = 1. (Doesn't come out good when solving for y… need calculator… on your test it will come out fine)

Answers

1. y'= $3(\ln x)^2/x$ 2. $f'(x) = \frac{2x\ln x - x}{(\ln x)^2}$ 3. $\frac{10x}{\sqrt{1-x^4}}$ 4. $\frac{5+x-x\ln x}{x(5+x)^2}$

5. $y'(x) = \frac{4}{(e^x + e^{-x})^2}$ 6. $2x\,e^{x^2}$ 7. 0.875 8. $\arctan(e^2) - \frac{\pi}{4}$ 9. ½ $\ln(x^2 + 1) + C$

10. ¼ $\ln|\sec(4x + 2)| + C$ 11. $\frac{5}{3}$ 12. 1 13. ¼

14. $y' = -2\cdot 3^{-2x} \ln 3$ 15. $f'(x) = \frac{2}{\sqrt{(1-4x^2)}}$ 16. $f'(x) = \frac{-15}{\sqrt{1-25x^2}}$ 17. $f'(x) = (\ln 4)\, 4^{x-5}$

18. $4\sin^{-1}(x/5) + c$ 19. $1/12 \tan^{-1}(x/3) + C$ 20. $\frac{1}{6}e^{3x^2+1} + C$

21. $\frac{6^x}{ln6} + C$ 22. $\ln|1 + e^x| + C$

23. 1/-6.303 = -.1587