

4.1 Exp and Log Derivatives

Calculus

Name: _____

CA #1

Find the derivative of each function.

1. $f(x) = e^{5x^2}$

2. $f(x) = 2 \ln(6x)$

3. $f(x) = e^{\sin(x^2)}$

4. $f(x) = \ln(\tan 5x)$

5. $f(x) = \ln(x^3 - 2)$

6. $f(x) = 4^{\cot x}$

7. $f(x) = \log_2(x^3)$

8. $f(x) = x \ln(4x)$

9. $f(x) = \ln(\sec x + \csc x)$

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

11. $f(x) = 3^{\sqrt{x}}$

12. $f(x) = \frac{\log_2 x}{e^x}$

13. $f(x) = \ln(5^x)$

14. $f(x) = \sin(\ln(x^5))$

15. If $f(x) = e^{3x^4}$, what is the equation of the tangent line at $x = 0$.

16. At what coordinate point(s) is the tangent line of $f(x) = e^{x^2}$ parallel to $y = -8$.

17. $f(x) = e^{\sin x}$ on the interval $0 < x < \pi$. On this interval, when will the average rate of change equal the instantaneous rate of change. [This is applying the Mean Value Theorem]

18. Find the values of x where the tangent line to the graph of $y = \ln(x)$ is parallel to $5x + 3y = 9$

Answers to 4.1 CA #1

1. $10xe^{5x^2}$	2. $\frac{2}{x}$	3. $2x \cos(x^2) e^{\sin(x^2)}$	4. $5 \sec 5x \csc 5x$	5. $\frac{3x^2}{x^3-2}$	6. $-\ln 4 \csc^2(x) 4^{\cot x}$
7. $\frac{3}{x \ln 2}$	8. $\ln(4x) + 1$	9. $\frac{\sec x \tan x - \csc x \cot x}{\sec x + \csc x}$	10. $\frac{2x \ln x - x}{(\ln(x))^2}$	11. $\frac{\ln(3)3^{\sqrt{x}}}{2\sqrt{x}}$	12. $\frac{\frac{1}{x \ln 2} - \log_2 x}{e^x}$
13. $\ln 5$	14. $\frac{5 \cos(\ln(x^5))}{x}$	15. $y = 1$	16. $(0,1)$	17. $x = \frac{\pi}{2}$	18. $x = -\frac{3}{5}$