

Homework II Second-Half

Due in class June 06 2017

0. Read The Following Sections:

Chapter 6. Differentiation: Section 6.10 Exponential Function, 6.11 Logarithmic Function

Chapter 7. Derivatives in Use: Section 7.1 Implicit Differentiation, 7.2 Economic Examples, 7.3 Differentiating the Inverse

1. Find the derivative of $f(x) = e^{x^3+2x^2}$
2. Find the derivative of $f(x) = \ln(e^{2x} + 1)$
3. Find the derivative of $f(x) = 3^{x+1} \ln(x - 1)$
4. Find the derivative of $f(x) = x^4 e^{-2x}$
5. Find all the intervals on which $f(x) = e^{-x^2}$ is decreasing and convex.
6. Use logarithmic differentiation to find $\frac{f'(x)}{f(x)}$ where $f(x) = \left(\frac{x+1}{x-1}\right)^{\frac{1}{3}}$ and $x > 1$
7. Use logarithmic differentiation to find the derivative of $f(x) = (x^2+1)^x$
8. Consider the equation $2xy - 3y^2 = 9$, assume y is a function of x .
 - (a). Find the equation of the tangent line to the curve of the equation at $(x, y) = (6, 1)$
 - (b). Compute y''
9. $f(x) = x^5 + x^3 + 2x + 1$.
 - (a). Show that f has inverse function.
 - (b). If g is the inverse function of f , compute $g'(1)$