

Section 4.3: The Chain Rule

Section Objectives:

- Know how to use the chain rule to find the derivative of functions which are compositions.

Practice Problems

Practice, Practice, Practice!

1. Find the derivative of $f(x) = (3x + 2)^3$.
2. Find the derivative of $f(x) = e^{5x^2+2}$.
3. Find the derivative of $f(x) = \sqrt{e^{4x}}$.
4. Find the derivative of $f(x) = e^x(\ln(x) + 7x^2)$.
5. Find the derivative of $f(x) = \sqrt{\sqrt{x^3 + 1} + 1}$.
6. Find the derivative of $f(x) = \frac{e^x+2}{x^3+2x+\ln(x)}$.

7. The demand for a product is given by

$$p(x) = \frac{3000}{\ln(x^2 + 1)},$$

where x is the number of items sold in thousands and p is the price per thousand items sold, in dollars.

(a) Find and interpret $p(12)$ and $p'(12)$. What are the units?

(b) Find the revenue function $R(x)$. Then find $R(12)$ and $R'(12)$. Give an interpretation and find the units.

More Practice from Textbook 4.3: You should do as many problems from each set (1-36, 37-44, 45-48), as needed until you are comfortable with these techniques. 37-44 are good practice for application problems.