

Objectives for Exam #3

To be well-prepared for Exam #3, you should be able to

- use the **definition** of derivative to compute $f'(x)$ for a simple polynomial function $f(x)$
- develop the derivative formula for $\cos(x)$ by using the definition of derivative
- recognize and use the relationships between the graph of a function and the graph of its derivative function
- state and use any of the derivative rules developed in this chapter: power rule, sum rule, constant multiple rule, product rule, quotient rule, and chain rule
- state and use all of the derivative formulas in this chapter which include formulas for derivatives of: power functions, trigonometric functions, exponential and logarithmic functions, inverse trigonometric functions, and the hyperbolic sine and hyperbolic cosine.
- understand how the chain rule applies to the above formulas. For example, $\frac{d}{dx} [\sin(g(x))] = \cos(g(x)) \cdot g'(x)$.
- understand how derivatives relate to rates of change
- be familiar with the notations and meaning of first, second, third, and higher order derivatives
- describe the difference between an explicitly defined function and an implicitly defined one
- determine the derivative of an implicitly defined function (using implicit differentiation)
- translate a “word problem” involving related rates into a corresponding math problem and then solve that math problem

At the least, you should expect to be asked to find the derivatives of a number of different functions and to solve more than one related rates problems.