Directed Study in Mathematics Name _____

2.1 Logarithmic Differentiation Date _____ Pd _____

Required reading:

- Larson 9e: pages 328-330
- Dawkins: Calculus I, section 3-13: Logarithmic Differentiation
  http://tutorial.math.lamar.edu/Classes/CalcI/LogDiff.aspx
  - Notes: Read all. (Last modified: 05/30/2018)
  - Practice Problems: Review all. (Last modified: 06/04/2018)

Required homework:

- Larson 9e: page 332, problems 103, 104, 105, 106
- Dawkins: Assignment problems 1, 7, 8, 10 (Last modified: 02/04/2019)

Additional comments regarding this topic:

We saw in AP Calculus BC how to find the derivative of logarithmic functions. This section expands on this, using logarithmic properties to show how to find the derivative of more complicated functions. The classic application of logarithmic differentiation is finding $\frac{d}{dx}(x^x)$, which does not allow for the use of the Power Rule (exponent has to be a constant) or exponential derivative rules (base has to be a constant). We will see how to find this derivative in the Dawkins reading.

Additional comments regarding the Larson reading:

Most of this reading is review of the derivative rules for logarithmic functions, so feel free to skim through. Examples 4 and 5 are useful in that they utilize logarithmic properties to rewrite the logarithm. Those same ideas are used in Example 6, which is the main part of this reading.

Pages 325-326 are an optional reading if a review of logarithmic properties is needed.