**8.2 Derivatives of Exponential Functions**

Let’s use the definition of derivatives / the difference quotient to try to compute the derivative of the exponential function 

 

Now let’s estimate the limit for *b* = 2 and *b* = 3

|  |  |  |  |
| --- | --- | --- | --- |
| *h* |  |  |  |
| 0.1 |  |  |  |
| 0.01 |  |  |  |
| 0.001 |  |  |  |
| 0.0001 |  |  |  |
|  |  |  |  |

Thus,  and 

This suggests that there must be a number *b* for which the limit is 1. We call this number

\*\* the exponential function 

**Differentiate:**

   

**Sketch the graph of **

 Domain: Intercepts:

 Symmetry: Asymptotes:

 Intervals of Increase or Decrease:

 Maximum or Minimum:

 Concavity:

 Points of Inflection: