1. Chapter 3 Section 2: The Exponential Function

We begin by exploring the graph of $g(x) = b^x$ and it's derivative for different values of b using the Desmos graph: https://www.desmos.com/calculator/akuzuxn4re.

(1) **Exponential Function with base e:** $\dfrac{d}{dx}(e^x) =$

(2) **Exponential Function with base a:** $\dfrac{d}{dx}(a^x) =$

Remark 1.1. *Notice the base in the above exponential expressions is* **constant** *while the exponent is* **variable**

Example 1.1. *Find the derivative of $f(x) = 2^x + x^2$.*

Example 1.2. $\dfrac{d}{dx}\left[e^{x+2}\right] = ?$

Example 1.3. *Find where the tangent line of $y = 3e^x - 4x$ is horizontal.*