# **Backpropagation (Math-heavy/Vectorized)**

## **Setting the context**

How does this differ from the previous section

1. We’ve looked at two different levels of complexity to the backpropagation algorithm so far
   1. No-math: A simple forward pass with no gradient calculation
   2. Light-math: Gradient calculation for each weight using chain rule
2. Now, with the Heavy-math version, our objective is to identify common calculations between different weights and re-use them to make our work simpler
3. Let us consider the example from the light-math backpropagation chapter
4. Consider dw131 or
   1. Here, we are certain about using the highlighted values for gradient computation. So we can pre-calculate and store them
   2. In the outermost layer

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1. Similarly, storing the values of will prove useful down the line