# 11040A Neural Networks

**Assignment 3**

**Deadline: May 29, 2025 24:00:00**

1. Composite functions can be depicted as computational graphs.

For example, the figure below shows the corresponding computational graph of function .

图片包含 物体, 游戏机, 照片, 钟表

描述已自动生成

Draw the computational graphs for the following functions and calculate the partial derivatives of all the functions with respect to .

1. For simplicity, a node can also represent a vector or a matrix in the computational graph. For example, function , where can be described as the figure below.

卡通人物

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Draw the computational graphs for the following functions and calculate the gradients of all the functions with respect to .

* 1. , where .
  2. , where .
  3. , where .

Notice that matrix calculus has largely two consistent layout conventions: *Numerator layout* and *Denominator layout*. Therefore, sometimes, the question may have more than one answer. (You may refer to the “Matrix calculus” entry on Wikipedia for more information.)