1 Problems

1.1 Problem 3.1

What kind of mapping from input to output would be created if the activation function in equation 3.1 was linear so that $a[z] = \psi_0 + \psi_1 z$? What kind of mapping would be created if the activation function was removed, so $a[z] = z$?

1.2 Problem 3.2

For each of the four linear regions in figure 3.3j, indicate which hidden units are inactive and which are active (i.e., which do and do not clip their inputs).

1.3 Problem 3.3*

Derive expressions for the positions of the "joints" in function in figure 3.3j in terms of the ten parameters ϕ and the input x. Derive expressions for the slopes of the four linear regions.

1.4 Problem 3.4

Draw a version of figure 3.3 where the y-intercept and slope of the third hidden unit have changed as in figure 3.14c. Assume that the remaining parameters remain the same.